UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF WASHINGTON

UNITED STATES OF AMERICA, Plaintiff, v. COW PALACE, LLC, *et al.*, Defendants.	Civil No. 24-cv-03092-TOR

DECLARATION OF MR. ERIC WINIECKI IN SUPPORT OF PLAINTIFF UNITED STATES' MOTION FOR PRELIMINARY INJUNCTION

I, Eric Winiecki, hereby declare as follows:

1. I am a Compliance Officer in the U.S. Environmental Protection Agency ("EPA"), Region 10, Enforcement and Compliance Assurance Division. Specifically, I work in the Field Data and Drinking Water Enforcement Section. My job duties include serving as a regulatory technical expert in the development,

negotiation, and litigation of civil, administrative, and criminal enforcement matters initiated under EPA's authorities in the Safe Drinking Water Act and its implementing regulations.

2. I received a Bachelor of Arts degree in economics from the University of Illinois, and a Master of Public Administration degree with a concentration in environmental policy from the University of Washington. Previous positions at EPA include serving as a Remedial Project Manager at five Superfund sites that involved assessing and addressing groundwater contamination. Since 2000, I've worked in EPA Region 10's drinking water program, and my job responsibilities included enforcement case officer, regional enforcement coordinator for the drinking water program, coordinator of a regional drinking water emergency response team, source water protection coordinator, and overseeing EPA grants to the Columbia Basin Ground Water Management Area, a four-county area in central Washington with groundwater nitrate contamination. Yakima County is not part of the Columbia Basin Ground Water Management Area.

3. Through my role at EPA, I have been assigned to issues relating to nitrate contamination in underground sources of drinking water in the Lower Yakima Valley, Washington, since 2008. As part of an EPA team, I have participated in a number of activities relating to these issues, including meeting with citizens, and state, local, and tribal government staff to listen to their concerns

about groundwater nitrate contamination; developing a February 2010 document entitled "Lower Yakima Valley Groundwater Quality Preliminary Assessment and Recommendations Document"; developing a study to assess the sources of nitrate in Lower Yakima Valley; and developing a 2013 summary report entitled "Relation Between Nitrate in Water Wells and Potential Sources in the Lower Yakima Valley, Washington."

4. In 2013, I helped to develop and negotiate an administrative order on consent ("Consent Order") that was executed on March 19, 2013, by EPA and Cow Palace, LLC ("Cow Palace Dairy"); D and A Dairy, L.L.C., George DeRuyter and Son Dairy, L.L.C., and George & Margaret, L.L.C. ("DeRuyter Dairy"); and Liberty Dairy, LLC and its associated dairy facility H&S Bosma Dairy ("Bosma Dairy") (collectively, "the Dairies"). Ex. A (Consent Order). Since 2013, I have served as EPA's Project Coordinator overseeing implementation of the Consent Order.

5. I make this declaration in support of Plaintiff United States of America's Motion for Preliminary Injunction. I could and would competently testify as to the facts set forth in this declaration if called as a witness in this action.

Underground Sources of Drinking Water in the Lower Yakima Valley

6. The Washington State Department of Ecology has estimated that 56,000 residents in the Lower Yakima Valley rely on groundwater for drinking

water, and approximately 24,000 residents rely on private domestic wells. Wash. Dep't of Ecology, "Quality Assurance Project Plan – Lower Yakima Valley Groundwater Management Area (GWMA) Ambient Groundwater Monitoring Network," June 2021, available at https://apps.ecology.wa.gov/publications/documents/2103106.pdf at 7 and 9.

7. In Washington, drinking water systems are divided into two categories: Group A public water systems and Group B public water systems. Group A public water systems have 15 or more service connections or serve 25 or more people 60 or more days per year. Group B public water systems serve fewer than 15 connections and fewer than 25 people per day. Group B public water systems are not regulated under the Safe Drinking Water Act. EPA uses the terms "private wells" or "residential wells" to mean individual drinking water wells that serve one home, shared drinking water wells that serve two homes, and Group B public water systems.

8. Several public water systems located downgradient of the Dairies source their drinking water from groundwater aquifers, including a public water system serving the City of Granger. Granger Water Department (ID Number 29000) is a "Group A" community water system serving a population of 3,905. I reviewed publicly available well logs (including dairy well logs and private residential well logs) of wells in the vicinity of the Dairy Facilities. The well logs

show that the alluvial aquifer underlying the Lower Yakima Valley currently supplies drinking water for human consumption, and that the alluvial and basaltic aquifers can provide water in sufficient quantity for a residential well and a public water system.

9. Upon these bases, among others, EPA has determined that the aquifers underlying the Lower Yakima Valley are used for human consumption and constitute "underground sources of drinking water" within the meaning of the Safe Drinking Water Act ("SDWA"), 42 U.S.C. § 300i, and its implementing regulations, 40 C.F.R. § 144.3. Ex. B (March 18, 2013 Memorandum Eric Winiecki to File).

10. Under the Consent Order, the Dairies were required to conduct nitrate testing, and provide alternative water where necessary, to residences within one mile downgradient of the Dairies' properties. The Dairies summarized this work in a Residential Well Sampling Report dated March 6, 2014, excerpted in Exhibit C. The Residential Well Sampling Report identified 224 residences within one mile of the Dairies' properties that sourced their drinking water from drinking water aquifers. Additional homes may have been constructed in this area since the Consent Order was signed. Ex. C at EPA_0000080.

2013 Administrative Order on Consent

11. On March 19, 2013, EPA exercised its emergency authority under SDWA Section 1431(a) and entered a Consent Order, Ex. A, that required the Dairies to perform certain actions in response to nitrate contamination in an underground source of drinking water in the Lower Yakima Valley.

12. The Consent Order concluded that nitrate was present in or likely to enter an underground source of drinking water and that it may present an imminent and substantial endangerment to the health of persons living downgradient of the Dairies.

13. The stated goal of the Consent Order is to achieve drinking water quality that meets the EPA maximum contaminant level ("MCL") for nitrate of 10 mg/L in the drinking water aquifer beneath and downgradient of the Dairy Facilities. The four objectives toward achieving this goal are:

a. Expeditiously provide a safe alternative drinking water supply to residents whose private drinking water wells exceed the MCL for nitrate (measured as nitrogen or "NO_3-N") and are on, or within one mile downgradient of, the Dairy Facilities;

b. Take specific actions to further control potential sources of nitrogen at the Dairy Facilities;

c. Establish a network of monitoring wells to measure the effectiveness of the nitrogen source-reduction actions on water quality in the shallow, alluvial aquifer, which serves as an underground source of drinking water; and

d. Ensure effective nutrient management at the Dairy Facilities to reduce the introduction of nitrate to an underground source of drinking water. Ex. A at EPA_0000026.

14. Among other things, the Consent Order requires the Dairies to:

a. Conduct testing at each residential well located on, or within one mile downgradient of, the Dairies' Facilities, and provide alternative water where results demonstrate nitrate concentrations exceeding the MCL.

b. Install groundwater monitoring wells and monitor the groundwater quarterly in accordance with the Groundwater Monitoring Quality Assurance Project Plan, the most recent of which was dated March 2018 and approved by EPA on February 28, 2018. Ex. D (Excerpt of 2018 Groundwater Monitoring QAPP).

c. Conduct soil sampling of manure application fields in the spring and fall.

d. Conduct an evaluation of each waste lagoon that was not constructed in accordance with the Washington State Natural Resources Conservation Service, Conservation Practice Standard No. 313 – Waste Storage Facility ("WA NRCS Standard 313") to determine whether that lagoon meets WA NRCS Standard 313. For each lagoon that does not meet the current standard, the Dairies shall develop and implement measures to address leakage or line the lagoons at the rate of one lagoon per Dairy Facility per year.

e. After eight years of groundwater monitoring, the Consent Order requires a statistical analysis to assess the nitrate trend in each downgradient monitoring well over the entire eight-year monitoring period. If nitrate contamination is not trending downward in one or more downgradient wells, the Dairies shall either: (a) submit a source investigation Quality Assurance Project Plan that identifies each well that exceeds the MCL and its potential sources, and then propose Supplemental Source Control Plans to address those sources; or (b) submit to EPA a Supplemental Source Control Plan and a schedule for implementation, without first conducting an investigation into potential sources.

15. The Consent Order terminates when the Dairies demonstrate that each downgradient monitoring well exhibits a downward trend in nitrate concentration or when the Dairies implement supplemental source control actions, and EPA notifies the Dairies that the terms of the Consent Order have been satisfactorily completed. Ex. A at EPA_0000039–40.

16. The Dairies' operations have expanded over time since they began their operations, but by 1996 the animal-housing footprints were similar to present day. The Dairies kept, on approximately the same half square mile of land, about 17,469 cows in 2000; 24,736 cows in 2005; and 27,265 cows in 2010. Ex. E.

17. More recently, in 2023, the the Dairies reported that they collectively kept 31,230 cows. Ex. F at EPA_0002113–14; EPA_0002144–45; EPA_0002192–93.

18. Dairies produce a considerable amount of liquid and solid animal waste, which is commonly referred to as liquid and solid manure. Dairies also produce process wastewater, which means water directly or indirectly used in the operation of the dairy for any or all of the following: spillage or overflow from animal watering systems; washing, cleaning, or flushing pens, barns, manure pits, or other dairy facilities; direct contact swimming, washing, or spray cooling of animals; or dust control. Process wastewater also includes any water which comes

into contact with any raw materials, products, or byproducts including manure, litter, feed, milk, or bedding. *See* 40 C.F.R. § 122.23(b)(7).

19. In 2023, the Dairies' 31,230 cows produced 351,714 tons of solid manure, 36,733,657 gallons of liquid manure, and 93,757,108 gallons of process wastewater. In 2023, Cow Palace Dairy's 13,050 animals produced 165,000 tons of solid manure, 11,931,611 gallons of liquid manure, and 44,588,481 gallons of process wastewater. Ex. F at EPA_0002113–14. In 2023, Bosma Dairy's 7,450 cows produced 97,000 tons of solid manure, 10,815,000 gallons of liquid manure, and 29,300,000 gallons of process wastewater. *Id.* at EPA_0002144–45. In 2023, DeRuyter Dairy's 10,730 cows produced 89,714 tons of solid manure, 13,987,046 gallons of liquid manure, and 19,868,627 gallons of process wastewater. *Id.* at EPA_0002192–93. For comparison, a dairy with 2,500 cows produces a waste load similar to that produced by a city of approximately 411,000 people. *See* Ex. G at EPA_0004676.

20. The liquid and solid manure produced by the Dairies contains nitrogen in organic and inorganic forms. Liquid manure and process wastewater commingle and are stored in large lagoons on the Dairies' Facilities and sprayed onto farm fields to grow crops.

Groundwater Monitoring at the Dairies

21. The Consent Order required the Dairies to conduct eight years of quarterly groundwater monitoring, which ended after the second quarter of 2021. "First quarter" groundwater monitoring occurs during several days on or around April 1, second quarter groundwater monitoring occurs on or around July 1, third quarter monitoring occurs on or around October 1, and fourth quarter monitoring occurs on or around January 1. The Dairies have submitted Quarterly Groundwater Monitoring Data Reports and Annual Groundwater Monitoring Data Reports to EPA under the Consent Order.

22. The 2018 Groundwater Monitoring QAPP describes required procedures for groundwater monitoring, such as sample collection and handling methods, maintenance of chain of custody, laboratory analytical methods, data validation procedures, and data reporting requirements. The Consent Order and the 2018 Groundwater Monitoring QAPP require groundwater samples to be analyzed for the following analytes: nitrate (as nitrogen), nitrite (as nitrogen), inorganic anions (chloride, fluoride, and sulfate), alkalinity (total and bicarbonate), ammonia (as nitrogen), total phosphorus, total Kjeldahl nitrogen, and metals (calcium, potassium, magnesium, and sodium). Table 4 of the 2018 Groundwater Monitoring QAPP, Ex. D at EPA_0000709, specifies the analytes, methods,

container, preservation method, and holding times for the groundwater samples collected during groundwater monitoring.

23. At the end of the eight-year monitoring period, which concluded on or around July 1, 2021, the Dairies had not completed all source control measures required by the Consent Order.

24. On or around August 5, 2021, EPA met with the Dairies and requested that the Dairies agree to voluntarily continue groundwater monitoring under the terms of the Consent Order and the 2018 Groundwater Monitoring QAPP for an additional eight years. Ex. H. EPA requested continued groundwater monitoring because after the eight years of monitoring concluded, nitrate levels in many monitoring wells remained above the 10 mg/L MCL and a significant number of monitoring wells were not trending downward. *Id.* at EPA_0003086. In addition, EPA requested continued monitoring "because source control work is ongoing, and because there is an unknown and variable time lag between source control actions and any resulting decrease in groundwater nitrate concentrations." *Id.*

25. As of July 2021, the Dairies had not yet lined or addressed leakage from Bosma Dairy Lagoons 1, 2, 3, 4a, 4b, and 5; DeRuyter Dairy Lagoons 1, 2, and 3; and the DeRuyter Dairy "Take-Up Pond." Ex. F (Excerpt of 2023 Annual Report) at EPA_0001485. Furthermore, the Dairies had failed to maintain some of the moisture sensors in their liquid manure application crop fields designed to

minimize infiltration and were not consistently controlling nitrate concentrations in soil at all of the fields. EPA also proposed postponing the identification and implementation of additional source control measures required by Consent Order Statement of Work Paragraphs III.G.2.a and III.G.2.b, so that the Dairies' remaining work under the Consent Order could be informed by a nitrate trend analysis conducted after the first phase of source control work was completed. *See* Ex. H at EPA_0003087–88.

26. Between August 2021 and June 2022, EPA and the Dairies engaged in negotiations over whether the Dairies would continue groundwater monitoring consistent with the terms of the 2018 Groundwater Monitoring QAPP but were unable to reach agreement.

27. Beginning in the fourth quarter of 2021, the Dairies voluntarily collected groundwater samples and had them analyzed in a laboratory for nitrate. The Dairies submitted quarterly reports to EPA after these sampling events, including data validation reports. However, the Dairies' groundwater sampling effort since the fourth quarter of 2021 has not been consistent with Consent Order requirements designed to ensure collected data is accurate and reliable.

28. The Consent Order required that the Dairies use only a certified drinking water laboratory to analyze groundwater samples for drinking water contaminants and that the Dairies provide written instruction to each laboratory to

perform analyses in accordance with approved analytical methods, including EPA Method 300.0 for nitrate as nitrogen (NO_3-N). Ex. A at EPA_0000027.

29. EPA Method 300.0 requires that the holding time, or the time period after sample collection and before analysis, shall be no more than 48 hours. *See* U.S. EPA Methods for the Chemical Analysis of Water and Waste ("MCAWW") Method 300.0 at 8 (Revision 2.1, Aug. 1993), available at https://www.epa.gov/sites/default/files/2015-08/documents/method_300-0_rev_2-1_1993.pdf.

30. After execution of the Consent Order in 2013, the Dairies selected ALS Environmental Laboratory, located in Kelso, Washington, to analyze groundwater samples collected from the monitoring well network. Kelso is approximately a three-and-a-half-hour drive from the Dairies, and shipping times interfered with the Dairies' ability to meet the required holding time for samples. During the eight-year monitoring period, EPA expressed concern in technical meetings and phone conversations with the Dairies' contractors, including Project Coordinator, Mark Larsen, that analysis of some groundwater samples was not being completed within the required holding time, resulting in the lab assigning those sample results a "J" data qualifier. The Dairies addressed EPA's concern regarding holding time violations by switching analysis to a closer laboratory located in the Lower Yakima Valley.

31. However, after the groundwater monitoring requirements of the Consent Order expired and the Dairies initiated voluntary sample collection, the Dairies resumed using ALS laboratory for all groundwater nitrate sample analyses and started violating the requisite holding time for nitrate analysis again, applying the "J" data qualifier to analytical results. The Dairies' 2022 Second Quarter Groundwater Monitoring Data Report explains that a "J" data qualifier means that the numerical value may be inaccurate in that, "The compound was positively identified; however, the associated numerical value is an estimated concentration." Ex. I at EPA_0003169. Results were qualified 'J' or 'UJ' to indicate an estimate and potential bias. *Id.* at EPA_0003094.

32. For example, in the Fourth Quarter of 2021, results for all 15 wells sampled by the Dairies had to be estimated because the holding times were exceeded. Ex. J at EPA_0003577–78.

33. In the Second Quarter of 2022, nitrate concentrations for 6 of 25 sampled monitoring wells had to be estimated because the holding times were exceeded. Ex. I at EPA_0003120; EPA_0003261–63.

34. In the Second Quarter of 2023, nitrate concentrations for all 24 sampled wells, including field duplicate samples, had to be estimated because the holding times were exceeded. Ex. K at EPA_0003663; EPA_0003700–01; EPA_0003842.

35. In the Third Quarter of 2023, nitrate concentrations for 9 of 17 sampled wells had to be estimated because the holding times were exceeded. Ex. L at EPA_0003996; EPA_0004134–37.

36. In the Fourth Quarter of 2023, nitrate concentrations for 11 of 17 sampled wells had to be estimated because the holding times were exceeded. Ex. M at EPA_0004269; EPA_0004403–06.

37. In addition to repeated violations of holding times, the Dairies' voluntary, post-Consent Order sampling does not analyze for other parameters required by the Consent Order.

Provision of Alternative Water

38. The 2013 Consent Order required the Dairies to offer free well testing to residences located within their Facilities' property boundaries and within one mile downgradient of the Dairy Facilities. Ex. A at EPA_0000042. If the drinking water at a residence exceeded the nitrate MCL, the Dairies were required to provide and maintain reverse osmosis filter treatment systems ("RO filters"), or other alternative safe water, at no cost to those residences. If the residence already had an RO filter installed, the Dairies were required to offer to maintain the RO filter. The Dairies are required to maintain the RO filters or provide alternative water until the Consent Order is terminated. Ex. A at EPA_0000030, Statement of Work at § III.D.9.

39. Under the Consent Order, in 2013 the Dairies identified 224 residences located within their Facilities' boundaries or within one mile downgradient. Ex. C at EPA_0000067–68. Of these, the Dairies conducted sampling at 141 residences. *Id.* Of the 141 residences sampled by the Dairies, approximately 67 exceeded the MCL. *Id.* Of those 67 residences, only 36 accepted the Dairies' offer of an RO filter. *Id.*

40. The Dairies' 2013 sampling efforts did not reach every residence. Nineteen residences were not sampled because there was no resident at home and follow-up contact requests failed. *Id.* In addition, eight residences were vacant, and four residences refused access. *Id.*

41. The Dairies also did not conduct sampling at 50 residences that reported to already have an RO filter. *Id.* For residences with preexisting RO filters, the Consent Order required the Dairies to offer professional maintenance. Of the 50 residences with preexisting RO filters, only 15 accepted the Dairies' offer for maintenance. *Id.*

42. In addition to being incomplete, the Dairies' 2013 efforts to provide testing and alternative water are now outdated. The 2023 Annual Report indicates that the Dairies serviced 61 residential RO filters in 2023 and provided bottled water at three additional homes. Ex. F at EPA_0001339. While the Dairies have provided additional homes with well testing and alternative water since their 2013

outreach, approximately 25 residences that exceeded the MCL in 2013 did not receive RO filter maintenance or bottled water from the Dairies in 2023. Ex. C at EPA_0000107–08 (Table 7); Ex. F at EPA_0001377–80 (Table 1).

43. A renewed outreach and testing effort is needed to ensure that current residents have an opportunity for free testing and alternative water, if necessary. The number of cattle and the quantity of manure at the Dairies have increased substantially since 2013, and residences within the one-mile Consent Order boundary that tested below the MCL in 2013 may now be exposed to unsafe water. Likewise, new residents in the area may not be aware of the likelihood that their drinking water exceeds the MCL, or may not be aware of the presence, purpose, or maintenance needs of an RO filter that was already in their house when they moved in. Residents who declined to have their water tested in 2013 or declined the Dairies' offer of alternative water may now be interested.

44. In 2015, this Court entered Consent Decrees between the Dairies, Community Association for Restoration of the Environment, Inc. ("CARE"), and Center for Food Safety, Inc., to address nitrate contamination in residential wells. The Consent Decrees required the Dairies to fund a third party, the Clean Drinking Water Project ("CDWP"), to provide bottled water or an RO filter to residents in an area approximately three miles downgradient of the Dairies' Facilities.

45. In a meeting between EPA and CARE's attorney on or around October 14, 2022, CARE's attorney stated some homes have been "missed" by the CDWP and are not protected, have never responded to the CDWP about water testing, or declined to talk with the CDWP. Ex. N at EPA_0004655. CARE's attorney also stated that some homes exceeded the nitrate MCL but did not opt for an RO filter or bottled water, while other homes have been sampled multiple times by the CDWP, and at some of these homes, the nitrate concentration has increased over time. *Id.*

46. EPA has requested information from CARE's attorney about the CDWP's progress in testing and providing alternative water to residences located within a three-mile boundary from the Dairies' Facilities.

Liquid Animal Waste Storage Lagoons

47. The Dairies store manure and wastewater in earthen impoundments commonly known as lagoons or waste storage ponds. When they signed the Consent Order with EPA in 2013, the Dairies had 41 earthen lagoons with a combined holding capacity of 126 million gallons of liquid animal waste. Cow Palace Dairy had nine lagoons. DeRuyter Dairy had 10 lagoons. Bosma Dairy had 22 lagoons. Ex. F at EPA_0001485 (Figure 3).

48. Leaching pollutants, such as nitrate, from earthen impoundments used to store wastewater and manure are a significant cause of groundwater

contamination. Ex. G at EPA_0004722–24. Since the effective date of the Consent Order, the U.S. Natural Resources Conservation Service ("NRCS") has recommended against siting any waste storage ponds in areas where (1) any underlying aquifer is at a shallow depth and not confined; and (2) the aquifer is a domestic water supply or ecologically vital water supply. Ex. B; *see also* U.S. NRCS Conservation Practice Standard: Waste Storage Facility, Code 313 (August 2023) at 9–10, available at https://www.nrcs.usda.gov/sites/default/files/2023-08/313_NHCP_CPS_Waste_Storage_Facility_2023.pdf. Both criteria applied—and still apply—to the area where the Dairies are located. The alluvial drinking water aquifer is shallow and not confined throughout a large portion of the Dairies' footprint. Hundreds of people in the Lower Yakima Valley near the Dairies rely on that aquifer as their only source of residential drinking water.

49. The Consent Order required the Dairies to provide documentation, i.e., plans and specifications signed by a Washington State licensed engineer, showing that their existing lagoons were constructed to the WA NRCS 313 standard in place when the Consent Order was signed. Ex. A at EPA_0000037, Statement of Work, § III.F.6. For any lagoons not documented to have been constructed to meet this standard, the Dairies were required to conduct field tests to assess whether such lagoons in fact met the standard. For any lagoons failing to meet this standard, the Dairies were required to submit a Lagoon Work Plan with

measures to address leakage or plans to line lagoons so that they meet the standard, and then implement these measures at the rate of one lagoon per Dairy Facility per year.

50. Except for Cow Palace Dairy Lagoon 4, the Dairies failed to demonstrate that their lagoons had been constructed to meet the WA NRCS 313 standard. The Dairies elected to forego field testing for their other 40 lagoons and opted to instead line their lagoons.

51. Since the Consent Order was signed in 2013, most of the Dairies' lagoons have been lined or abandoned in accordance with the Consent Order. However, work remains to be done at several lagoons to mitigate significant risk to the drinking water and human health.

Cow Palace Dairy Lagoon 1

52. Cow Palace Dairy's Lagoon 1 is the third largest of the Dairies' lagoons, with a surface area exceeding three acres and a capacity of 13.8 million gallons. Ex. O at EPA_0004953 (Figure 3).

53. Cow Palace Dairy installed a double-liner system at Lagoon 1, which consists of two plastic sheets separated by a drainage layer. The bottom of the lagoon is shaped so that any liquid that leaks through the top liner will be caught by the lower liner and flow by gravity between the liners into a sump constructed at the lowest part of the lagoon bottom. A pump is installed in the sump that turns

on automatically if liquid leaking through the upper liner accumulates to a specific level in the sump.

54. The double-liner system at Cow Palace Dairy's Lagoon 1 provides a leak detection system for the upper liner and, by extension, the whole liner system. But it only works if the lower liner has sufficient integrity to convey all liquid waste to the sump. If liquid waste leaks through the upper liner and the lower liner before it reaches the sump, the leak detection system does not function.

55. Cow Palace Dairy reported to EPA that it began installation of the double liner at Lagoon 1 in November 2019. The lower liner had been installed, and the upper liner had not yet been installed, when work on the liner system was halted over a holiday weekend. Cow Palace Dairy reported that during the weekend, a windstorm occurred. High winds lifted and crumpled the lower plastic liner, resulting in a 350-foot tear and several significant but smaller tears.

56. The Cow Palace Dairy Facility Installation Quality Assurance and Quality Control Manual ("QA/QC Manual") for Lagoon 1 includes detailed requirements for installing liners, including that the Dairy will not install a liner during high winds, and that the Dairy will use adequate temporary ballast and/or anchoring (i.e., sandbags,) to prevent uplift of the liner by wind. Ex. P at EPA_0006184. The Plan also prohibits the use of damaged liner material in this lagoon. *Id.* at EPA_0006156. Nevertheless, Cow Palace Dairy pulled the

damaged lower liner back into place with heavy equipment, repaired the tears, and completed installation of the lower liner over eight days between November 29 and December 6, 2019. Ex. Q at EPA_0006213. Cow Palace Dairy began installing the upper liner on top of the windblown liner on the same day, December 6, 2019. *Id.* at EPA_0006242.

57. Cow Palace Dairy failed to notify EPA of the windstorm and resulting damage until March 2020. The Dairy submitted a March 31, 2020 report which failed to mention the windstorm or the damaged liner in the body of the report. Instead, information about the windstorm and the blowout of the "completely installed" lower liner was included only in photos, tables, and drawings contained in appendices of the Report, including a table of liner repairs that identified repair of the 350-foot liner tear and photos of the crumpled liner in an appendix. Ex. Q at EPA_0006238–42; EPA_0006370.

58. Cow Palace Dairy's March 31, 2020 report also failed to notify EPA of a leak it discovered upon startup in February 2020 in Lagoon 1.

59. In an annual progress report, dated March 1, 2021, Cow Palace Dairy first notified EPA of the leak in Lagoon 1, stating that a total of 122,051 gallons of leachate were produced. Ex. R at EPA_0006577; EPA_0007014. In a revised Lagoon 1 Completion Report, dated November 24, 2021, Cow Palace Dairy indicated that, in April and May 2020, Cow Palace Dairy investigated and

discovered multiple failed seams in the upper liner. Ex. S at EPA_0008706. Cow Palace Dairy emptied the lagoon, repaired three seams adjacent to the sump, and refilled the lagoon. *Id.*

60. Monitoring well DC-14 is located directly south, downgradient, and approximately 50 yards from Cow Palace Dairy Lagoon 1. The nitrate concentration in monitoring well DC-14 was consistently less than 10 mg/L during quarterly sampling for three years from 2016 through 2019. After construction of the Lagoon 1 liner system, nitrate concentrations in monitoring well DC-14 began to increase. DC-14 first exceeded the MCL in the second quarter of 2020 with a concentration of 11.5 mg/L. Samples from monitoring well DC-14 have exceeded the MCL in every subsequent quarter with concentrations as high as 57.4 mg/L in June 2022 and 55.7 mg/L in December 2022. Ex. M at EPA_0004278 (Table 8).

61. In a letter dated January 27, 2022, EPA reminded Cow Palace Dairy that the approved design for the Lagoon 1 liner system specified that the damaged liner should not have been used. EPA expressed concern regarding the integrity of the liner and the likelihood that leakage from Lagoon 1 was the source of increased nitrate contamination in monitoring well DC-14. Ex. T at EPA_0009111–14.

62. The Cow Palace QA/QC Manual outlines all manufacturer installation quality assurance manuals to be used during the lining of Lagoon 1 to ensure liners are installed in accordance with manufacturer recommendations and the project's

specifications. *See* Ex. P at EPA_0006136. On April 20, 2022, under Paragraph 14 of the Consent Order, EPA required Cow Palace Dairy to prepare an addendum to its QA/QC Manual for tests to determine whether Lagoon 1 was leaking and a schedule to promptly complete the work. Ex. U.

63. On May 13, 2022, Cow Palace Dairy replied to EPA, declining to prepare the required addendum. Ex. V at EPA_0009117–18.

64. Based on current nitrate levels at DC-14 and the spike since the second quarter of 2020, Lagoon 1 is likely leaking due to a liner failure such that immediate testing for leakage is appropriate. Cow Palace Dairy has failed to submit the addendum to the QA/QC Manual required by EPA on April 20, 2022, and has not tested the Lagoon 1 liner system for leakage.

Consultation with State and Local Government

65. EPA has been meeting regularly with the Washington Department of Health, the Washington Department of Ecology, the Washington Department of Agriculture, Yakima County Public Services, and Yakima Health District since January 2022 regarding the nitrate problem in the Lower Yakima Valley. The Washington Department of Health and the Washington Department of Ecology have written to EPA stating that they have a shared interest with EPA in ensuring the protection of public health and the environment in the Lower Yakima Valley. EPA's Consent Order with the Dairies has influenced how the state agencies

focused their resources and activities in locations not covered by the Consent Order. The state agencies support EPA's continued exercise of its SDWA Section 1431 authority to enforce the Consent Order and address the imminent and substantial endangerment from the Dairies; they do not plan to duplicate EPA's efforts relating to the Dairies. Ex. W. Yakima County has started to contact and provide well testing and alternative water for some residents in the Lower Yakima Valley, but the County's plans will not address source control at the Dairies and do not include residents within one mile downgradient from Defendants' properties.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on: 7/1/2024 Eric Winiecki

Date Eric Winiecki

Exhibits

1. Attached hereto as Exhibit A is a true and correct copy of the Administrative Order on Consent between EPA and Cow Palace, LLC; D and A Dairy, L.L.C.; George DeRuyter and Son Dairy, L.L.C.; George & Margaret, L.L.C.; and Liberty Dairy, LLC and its associated Dairy Facility H & S Bosma Dairy, Docket No. SDWA-10-2013-0080, March 19, 2013. This document has been kept in EPA's records in the ordinary course of EPA's enforcement activities.

2. Attached hereto as Exhibit B is a true and correct copy of a March 18, 2013 Memorandum to the File from Eric Winiecki regarding Underground Sources of Drinking Water in the Yakima Valley. I personally prepared this memorandum which has been kept in EPA's records in the ordinary course of EPA's enforcement activities.

3. Attached hereto as Exhibit C is a true and correct copy of an excerpt of a document received by EPA entitled "Yakima Valley Dairies Provision of Water Residential Well Sampling Report" prepared by Dairies' contractor ARCADIS, dated March 6, 2014. This report has been kept in EPA's records in the ordinary course of EPA's enforcement activities.

4. Attached hereto as Exhibit D is a true and correct copy of an excerpt of a document received by EPA entitled "Groundwater Monitoring Quality Assurance Project Plan" prepared by Dairies' contractor ANCHOR QEA, dated

March 2018. This report has been kept in EPA's records in the ordinary course of EPA's enforcement activities.

5. Attached hereto as Exhibit E is a true and correct copy of an Excel spreadsheet titled "Inspection Reports Summary" compiling data on cow numbers from inspection reports that EPA received from the Washington Department of Agriculture. I personally prepared this spreadsheet based on data reported in the inspection reports.

6. Attached hereto as Exhibit F is a true and correct copy of excerpts of a document received by EPA entitled "Yakima Valley Dairies 2023 Annual Report" prepared by Dairy contractor ANCHOR QEA on or around March 1, 2024. This report has been kept in EPA's records in the ordinary course of EPA's enforcement activities.

7. Attached hereto as Exhibit G is a true and correct copy of "EPA Risk Assessment Evaluation for Concentrated Animal Feeding Operations," EPA document number EPA/600/R-04/042, May 2004. This report has been kept in EPA's records in the ordinary course of EPA's enforcement activities.

8. Attached hereto as Exhibit H is a true and correct copy of a letter from Eric Winiecki of EPA to Mark Larsen of ANCHOR QEA and Eric Weber of Landau Associates regarding Groundwater Monitoring, dated September 23, 2021.

I personally prepared this latter, which has been kept in EPA's records in the ordinary course of EPA's enforcement activities.

9. Attached hereto as Exhibit I is a true and correct copy of excerpts of a document received by EPA entitled "Second Quarter 2022 Groundwater Monitoring Data Report, Yakima Valley Dairies," prepared by ANCHOR QEA, dated August 15, 2022. This report has been kept in EPA's records in the ordinary course of EPA's enforcement activities.

10. Attached hereto as Exhibit J is a true and correct copy of excerpts of a document received by EPA entitled "Fourth Quarter 2021 Groundwater Monitoring Data Report, Yakima Valley Dairies" prepared by ANCHOR QEA, dated February 15, 2022. This report has been kept in EPA's records in the ordinary course of EPA's enforcement activities.

11. Attached hereto as Exhibit K is a true and correct copy of excerpts of a document received by EPA entitled "Second Quarter 2023 Yakima Valley Dairies Consent Decree Groundwater Monitoring Data Transmittal" prepared by ANCHOR QEA, dated August 21, 2023. This report has been kept in EPA's records in the ordinary course of EPA's enforcement activities.

12. Attached hereto as Exhibit L is a true and correct copy of excerpts of a document received by EPA entitled "Third Quarter 2023 Groundwater Monitoring Data Report, Yakima Valley Dairies" prepared by ANCHOR QEA, dated

November 9, 2023. This report has been kept in EPA's records in the ordinary course of EPA's enforcement activities.

13. Attached hereto as Exhibit M is a true and correct copy of excerpts of a document received by EPA entitled "Fourth Quarter 2023 Groundwater Monitoring Data Report, Yakima Valley Dairies" prepared by ANCHOR QEA, dated February 5, 2024. This report has been kept in EPA's records in the ordinary course of EPA's enforcement activities.

14. Attached hereto as Exhibit N is a true and correct copy of a Memorandum to the File regarding "Clean Drinking Water Project" by Eric Winiecki dated November 3, 2022. I personally prepared this memorandum, which has been kept in EPA's records in the ordinary course of EPA's enforcement activities.

15. Attached hereto as Exhibit O is a true and correct copy of an excerpt of a document received by EPA entitled "Yakima Valley Dairies 2022 Annual Report" prepared by ANCHOR QEA, dated March 1, 2023. This report has been kept in EPA's records in the ordinary course of EPA's enforcement activities.

16. Attached hereto as Exhibit P is a true and correct copy of a document received by EPA entitled "Cow Palace Dairy Facility Installation Quality Assurance and Quality Control Manual Facilities Covered: Lagoon 1" prepared by

Water & Environmental Technologies, Dated April 18, 2018. This document has been kept in EPA's records in the ordinary course of EPA's enforcement activities.

17. Attached hereto as Exhibit Q is a true and correct copy of an excerpt of a document received by EPA entitled "Cow Palace Dairy Lagoon No. 1 and Safety Debris Catch Basin Completion Report" prepared by ANCHOR QEA, dated March 31, 2020. This report has been kept in EPA's records in the ordinary course of EPA's enforcement activities.

18. Attached hereto as Exhibit R is a true and correct copy of an excerpt of a document received by EPA entitled "Yakima Valley Dairies 2020 Annual Report" prepared by ANCHOR QEA, dated March 1, 2021. This report has been kept in EPA's records in the ordinary course of EPA's enforcement activities.

19. Attached hereto as Exhibit S is a true and correct copy of an excerpt of a document received by EPA entitled "Cow Palace Dairy Lagoon No. 1 and Safety Debris Catch Basin Completion Report" prepared by ANCHOR QEA, dated November 24, 2021. This report has been kept in EPA's records in the ordinary course of EPA's enforcement activities.

20. Attached hereto as Exhibit T is a true and correct copy of a letter from Eric Winiecki of EPA to Eric Weber of Landau Associates and Mark Larsen of ACHOR QEA, regarding "Cow Palace Dairy Lagoon 1 Closure Report," dated

January 27, 2022. I personally prepared this letter, which has been kept in EPA's records in the ordinary course of EPA's enforcement activities.

21. Attached hereto as Exhibit U is a true and correct copy of a letter from Eric Winiecki of EPA to Eric Weber of Landau Associates and Mark Larsen of ACHOR QEA, regarding "Cow Palace Dairy Lagoon 1 Closure Report," dated April 20, 2022. I personally prepared this letter, which has been kept in EPA's records in the ordinary course of EPA's enforcement activities.

22. Attached hereto as Exhibit V is a true and correct copy of a May 13, 2022, letter from Eric Weber of Landau Associates, to Eric Winiecki of EPA regarding "Cow Palace Lagoon 1 Closure Report." I personally received this letter, which has been kept in EPA's records in the ordinary course of EPA's enforcement activities.

23. Attached hereto as Exhibit W is a true and correct copy of a letter from Washington Department of Health and Washington Department of Ecology, to EPA titled "Lower Yakima Valley Groundwater Management for Protection," dated January 29, 2024. This letter has been kept in EPA's records in the ordinary course of EPA's enforcement activities.

Eric Winiecki Declaration
Exhibit A

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10

In the Matter of: Yakima Valley Dairies Cow Palace, LLC; D & A Dairy, LLC (also known as D and A Dairy L.L.C.), George DeRuyter & Son Dairy, L.L.C., and George & Margaret, L.L.C.; Liberty Dairy, LLC, and its associated Dairy Facility H & S Bosma Dairy Respondents	)	ADMINISTRATIVE ORDER ON CONSENT Proceeding under Section 1431(a) of the Safe Drinking Water Act, 42 U.S.C. § 300i(a) Docket No. SDWA-10-2013-0080

TABLE OF CONTENTS

I. STATUTORY AUTHORITY 2
II. STIPULATIONS 2
III. PARTIES BOUND 3
IV. DEFINITIONS 3
V. EPA'S FINDINGS OF FACT 4
VI. CONCLUSIONS OF LAW 7
VII. WORK TO BE PERFORMED 8
VIII. ADDITIONAL WORK 10
IX. ACCESS TO PROPERTY AND INFORMATION 10
X. RECORD RETENTION 12
XI. DISPUTE RESOLUTION 12
XII. FORCE MAJEURE 13
XIII. STIPULATED PENALTIES 14
XIV. RESERVATIONS AND GENERAL PROVISIONS 16
XV. MODIFICATIONS 17
XVI. TERMINATION AND SATISFACTION 18
XVII. INTEGRATION/APPENDICES 18
XVIII. EFFECTIVE DATE 18

I. STATUTORY AUTHORITY

1. This Administrative Order on Consent ("Consent Order") is entered into by the United States Environmental Protection Agency ("EPA") and Cow Palace, LLC; D & A Dairy, LLC (also known as D and A Dairy L.L.C.), George DeRuyter & Son Dairy, L.L.C., and George & Margaret, L.L.C.; Liberty Dairy, LLC, and its associated dairy facility H & S Bosma Dairy (collectively "the Respondents"). This Consent Order provides for the performance of certain actions by Respondents in response to nitrate contamination in an underground source of drinking water in the Lower Yakima Valley, Yakima County, Washington.

2. This Consent Order is issued pursuant to the authority vested in the Administrator of the EPA by Section 1431(a) of the Safe Drinking Water Act ("SDWA" or "the Act"), 42 U.S.C. § 300i(a). The authority to issue this Consent Order was delegated to the Regional Administrator by Delegation No. 9-17, dated May 11, 1994. This authority was further delegated to the Director, Office of Compliance and Enforcement.

II. STIPULATIONS

3. The EPA and Respondents recognize that this Consent Order has been negotiated in good faith and that the actions undertaken by Respondents in accordance with this Consent Order do not constitute an admission of fault or liability. EPA and Respondents have voluntarily entered into this Consent Order in lieu of alternatives available to the Parties, including litigation. Respondents do not admit, and retain the right to controvert in any subsequent proceedings other than proceedings to implement or enforce this Consent Order, the validity of the findings of fact, conclusions of law, and determinations in Sections V and VI of this Consent Order. Respondents agree to comply with and be bound by the terms of this Consent Order and further agree that they will not contest the basis or validity of this Consent Order or its terms as specified herein.

4. Except as stated in Sections XI and XII, Respondents waive any and all claims for relief and otherwise available rights to or remedies involving judicial or administrative review that the Respondents may have with respect to any issue of fact or law set forth in this Consent Order, including, but not limited to, any right of judicial review under Section 1448 of the SDWA, 42 U.S.C. § 300j-7.

5. The Parties agree that nothing in this Consent Order is intended to impair or adversely affect the ability of Respondents to obtain federal or state grants or loans to finance an existing or future dairy digester or other projects.

III. PARTIES BOUND

6. Notice of this Consent Order shall be given to any successor(s) in interest prior to transfer of any Dairy Facility or its operations.

7. Respondents shall provide a copy of this Consent Order to all contractors, subcontractors, laboratories, and consultants retained to conduct any portion of the Work performed pursuant to this Consent Order within seven (7) calendar days of the Effective Date of this Consent Order, or on the date of such retention; and Respondents shall condition all such contracts on compliance with the terms of this Consent Order. The provisions of this Consent Order shall apply to and be binding upon the Respondents, their officers, contractors, directors, agents, successors and assigns. Each Respondent shall give notice of this Consent Order to any successor in interest prior to such Respondent's transfer of any legal interests within the Dairy Facilities that are the subject of this Order. Any change in ownership or corporate status of a Respondent, including but not limited to, any transfer of assets or real or personal property shall not alter such Respondent's responsibilities under this Consent Order. Action or inaction of any persons, firms, contractors, employees, agents, or corporations acting under, through or for the Respondents, shall not excuse any failure of the Respondents to fully perform their obligations under this Consent Order.

8. Each Respondent shall be responsible for carrying out the actions required by this Consent Order on the property owned or operated by it within the boundaries depicted on Appendix A and the actions required by this Consent Order on those properties described in Sections III.D. and F.7 of the Statement of Work. This Consent Order is intended to include the property owned and operated by Respondents within the boundaries depicted on Appendix A. Except for shared responsibilities under this Consent Order, one Respondent's failure to comply with this Consent Order shall not in any way affect or establish liability to EPA for any other Respondent. Each Respondent shall give notice to the EPA at least thirty (30) calendar days prior to transfer of ownership and/or operation of the Dairy Facility owned or operated by it.

IV. DEFINITIONS

9. Unless otherwise expressly provided in this Consent Order, terms used in this Consent Order which are defined in the SDWA or in regulations promulgated under the SDWA shall have the meaning assigned to them in the SDWA or in such regulations. Whenever terms listed below are used in this Consent Order, the following definitions shall apply:

"Consent Order" means this Administrative Order on Consent and all appendices attached hereto (listed in Section XVII). In the event of conflict between this Consent Order and any appendix, this Consent Order shall control.

"Dairy Facility" or "Dairy Facilities" means the facility or facilities owned or operated by Respondents and depicted on Appendix A.

"Day" means a calendar day unless otherwise specified. In computing any period of time under this Consent Order, where the last day would fall on a Saturday, Sunday, or federal holiday, the period shall run until the close of business of the next working day.

"Downgradient" means in the direction of the flow of groundwater in the aquifer.

"Effective Date" shall be the effective date of this Consent Order as provided in Section XVIII.

"Paragraph" means a portion of this Consent Order identified by an Arabic numeral.

"Parties" means EPA and the Respondents.

"Respondents" means the following entities, each of which is a Respondent: Cow Palace, LLC; D & A Dairy, LLC (also known as D and A Dairy L.L.C.), George DeRuyter & Son Dairy, L.L.C., and George & Margaret, L.L.C.; Liberty Dairy, LLC, and its associated Dairy Facility H & S Bosma Dairy.

"Section" means a portion of this Consent Order identified by a Roman numeral.

"Silage" means fermented, high-moisture fodder that can be fed to ruminants (cud-chewing animals like cattle and sheep) and has high nutrient content.

"Statement of Work" or "SOW" means the statement of work for implementation of the work required under this Consent Order, as set forth in Appendix B to this Consent Order, and any modification made thereto in accordance with this Consent Order.

"Work" means all activities Respondents are required to perform under this Consent Order.

V. EPA's FINDINGS OF FACT

10. The following findings of fact and conclusions of law are set forth solely for the purpose of establishing jurisdiction for this Consent Order. Respondents do not admit any finding of fact or conclusion of law stated herein. Based on the information in its possession, particularly that contained in the Administrative Record, the EPA makes the following findings of fact:

a. Cow Palace, LLC, (one of the Respondents) owns or operates a Dairy Facility which includes two dairy barns commonly referred to as Cow

Palace I and Cow Palace II. The dairy farm is located at 1631 N. Liberty Road, Granger Washington, 98932, and depicted on Appendix A.

b. George DeRuyter and Son Dairy, L.L.C., (one of the Respondents) owns or operates a Dairy Facility located at 5121 Dekker Road, Outlook, Washington 98938, and depicted on Appendix A. George and Margaret, L.L.C. owns buildings at the Dairy Facility.

c. D & A Dairy LLC (also known as D and A Dairy, L.L.C.), (one of the Respondents) owns or operates a Dairy Facility located at 5121 Dekker Road, Outlook, Washington 98938, and depicted on Appendix A. George and Margaret, L.L.C. owns buildings at the Dairy Facility.

d. Liberty Dairy, LLC, (one of the Respondents) owns or operates a Dairy Facility located at 5860 E. Zillah Drive, Granger, Washington, with a mailing address at 4300 Beam Road, Zillah, Washington 98953 and depicted on Appendix A.

e. H & S Bosma Dairy owns or operates a Dairy Facility located at 823 N. Liberty Road, Granger, Washington, with a mailing address at 4300 Beam Road, Zillah, Washington 98953 and depicted on Appendix A.

f. Dairy cows produce a considerable amount of manure which contains nitrogen in organic and inorganic forms. Nitrogen compounds move in air, surface runoff, and through percolating groundwater.

g. Percolating water and leachate from leaky lagoons and other animal waste storage facilities may transport nitrate to groundwater.

h. Liquid manure from the dairies is sprayed onto farm fields to grow crops. Ammonia from the manure converts to nitrite and then to nitrate. Crops uptake a certain amount of nitrate. Quantities of nitrate and nitrite in the soil in excess of levels which can be used by crops may migrate to the water table, contaminating groundwater. Nitrate is highly mobile, especially through highly permeable soils, where it moves easily with water downward through the soil profile to groundwater.

i. The hydrological setting in the vicinity of these Dairy Facilities consists of fine- and coarse-grained sediments overlying a sequence of three major basalt flows. The structural setting is created by bounding ridges such as the Rattlesnake Mountains, Ahtanum Ridge, Toppenish Ridge, and Horse Heaven Hills. The uppermost basalts of the Saddle Mountain Unit of the Columbia River Basalt Group are typically exposed in these upland ridges. This unit averages more than 500 feet thick. The underlying Wanapum unit averages 600 feet thick.

These units are separated by the Mabton Interbed, with an average thickness of 70 feet.

j. There are two main aquifer types underlying the area. They include a surficial unconfined to semi-confined alluvial aquifer and an extensive basalt aquifer of great thickness underlying the sedimentary deposits. The basalt aquifer is believed to be semi-isolated from the surficial aquifer and stream systems. Groundwater flow within the surficial aquifer generally follows topography, with natural recharge occurring within the headlands and on the sides of the valley and discharge occurring to the Yakima River. Flow within the uppermost portions of the underlying basaltic aquifer also generally follows this pattern.

k. The highest levels of nitrate generally occur in the shallow alluvial aquifer. Water-bearing zones in the upper basaltic layers that underlie the alluvial aquifer may be vulnerable to contamination from the shallow aquifer. Basaltic layers develop significant fracture permeability as they cool after volcanic eruption. They are often referred to as "fractured basalts."

l. Examination of available well logs in the vicinity of these Dairy Facilities indicates that residential wells are typically screened in the shallow alluvial aquifer or in the upper basalt layers. Wells screened in these zones are particularly vulnerable to anthropogenic contamination. The fractured condition of the shallow basalts often means the water-bearing layers between the shallow basaltic layers are likely to be in communication with the shallow aquifer. A well pump set in a shallow basaltic water-bearing zone could, depending on conditions, pull contaminated water down through the shallow upper layers.

m. Potential sources of nitrogen at Respondents' Dairy Facilities include pens, manure piles, manure lagoons, and application fields.

n. The SDWA maximum contaminant level ("MCL") for nitrate measured as nitrogen is 10 mg/L, which is equivalent to 10 parts per million. See 40 C.F.R. § 141.62.

o. In February and April 2010, and in December 2011, the EPA collected samples from residential drinking water wells located in the area of the Dairy Facilities. Several households within one mile downgradient of the Dairy Facilities were found to have a residential drinking water well with nitrate above the 10 mg/l MCL.

p. The MCL for nitrate under the National Primary Drinking Water Regulations is 10 mg/L as nitrogen. See 40 C.F.R. § 141.62. The EPA has established this drinking water standard to protect against the adverse effects of nitrate. Concentrations of nitrate that are above 10 mg/L pose a health threat to

the population in general, and an acute health threat to children less than 6 months of age. This level was based on human case studies in which fatal poisonings have occurred following the ingestion of well water containing nitrate concentrations greater than 10 mg/L. Therefore, above the concentration of 10 mg/L in drinking water, nitrate may present an imminent and substantial endangerment to the health of persons.

q. The EPA has communicated with Washington State and local authorities to confirm the correctness of the information regarding the nitrate contamination found in the underground source of drinking water, and to ascertain what action the State is or will be taking. Neither Washington State nor local authorities are or will be taking the steps described in this Consent Order to address the nitrate contamination in the underground source of drinking water.

VI. CONCLUSIONS OF LAW

11. Based upon the foregoing Findings of Fact and the Administrative Record supporting this Consent Order, the EPA hereby concludes that:

a. Each Respondent is a "person" as defined by Section 1401(12) of the SDWA, 42 U.S.C. § 300f(12).

b. Nitrate is a "contaminant" within the meaning of Section 1401(6) of the SDWA, 42 U.S.C. § 300f(6).

c. The aquifers in the area of the Respondents' Dairy Facilities are underground sources of drinking water within the meaning of 40 C.F.R. § 144.3.

d. The EPA has information that contaminants, including nitrate, are present in or are likely to enter an underground source of drinking water and that it may present an imminent and substantial endangerment to the health of persons, and that appropriate State and local authorities have not acted to protect the health of such persons, in accordance with Section 1431(a) of the SDWA, 42 U.S.C. § 300i(a).

e. The EPA has determined that the actions required by this Consent Order are necessary to protect the health of persons who are currently consuming or who may consume or use water from the contaminated portion of the aquifer.

f. The EPA has consulted with the State and local authorities in order to confirm the correctness of the information on which this Consent Order is based and to ascertain the action which such authorities are or will be taking, in accordance with Section 1431 of the SDWA, 42 U.S.C. § 300i.

VII. WORK TO BE PERFORMED

12. Based on the foregoing Findings of Fact, Conclusions of Law, and the Administrative Record, pursuant to Section 1431(a) of the SDWA, 42 U.S.C. § 300i(a), Respondents agree to and are hereby ORDERED to comply with all the provisions of this Consent Order, including, but not limited to all attachments to this Consent Order and all documents incorporated by reference into this Consent Order.

13. Designation of Contractor and Project Coordinators

a. For those actions that entail routine farming and dairying activities, Respondent may choose to undertake those actions using Dairy Facility personnel. Otherwise, Respondents, individually or collectively, shall retain one or more contractors to perform the actions specified in the Statement of Work and shall notify the EPA of the name(s) and qualifications of such contractor(s) within ten (10) days of the Effective Date. Respondents shall also notify the EPA of the name(s) and qualification(s) of any other contractor(s) or subcontractor(s) retained to perform the Work at least twenty (20) days prior to commencement of such Work.

b. Within ten (10) days after the Effective Date, each Respondent shall designate a Project Coordinator who shall be responsible for administration of all actions by the corresponding Respondent required by this Consent Order and shall submit to EPA the designated Project Coordinator's name, address, telephone number, and qualifications. Receipt by each Respondent's Project Coordinator of any notice or communication from EPA relating to this Consent Order shall constitute receipt by the corresponding Respondent.

c. The EPA has designated Eric Winiecki as EPA's Project Coordinator. Except as otherwise provided in this Consent Order, Respondents shall direct all communications, including submissions required by this Consent Order, to EPA's Project Coordinator. Mr. Winiecki's contact information is:

Eric Winiecki
EPA Project Coordinator
U.S. Environmental Protection Agency, Region 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101
206-553-6904
Winiecki.Eric@epa.gov

d. The EPA and each Respondent shall have the right, subject to Paragraph 13b., to change their respective designated Project Coordinator. Respondents shall notify the EPA twenty (20) days before such a change is made. The initial notification may be made orally, but shall be promptly followed up by a written notice.

14. Actions Required and Submissions

a. Respondents shall perform, at a minimum, all actions necessary to implement the Statement of Work.

b. The EPA may approve, disapprove, require revisions to or modify the submissions in whole or in part, consistent with the Statement of Work. If the EPA requires revisions, Respondents shall submit a revised submission as specified in the EPA's letter requiring revisions. Respondents shall implement each plan or document as approved in writing by the EPA in accordance with the schedule approved by the EPA.

c. Once approved, or approved with modifications, each plan, schedule, any other document submitted, and any subsequent modification shall be incorporated into and shall be fully enforceable under this Consent Order.

d. Respondents shall not commence any Work except in conformance with the terms of this Consent Order. Respondent shall not commence implementation of Work until receiving written approval pursuant to this Paragraph.

e. Prior to the EPA's written approval, no plan, report, or schedule shall be construed as being approved and final. Oral advice, suggestions, or comments given by the EPA representatives do not constitute approval, nor shall any oral approval or oral assurance of approval be considered binding.

15. All submissions pursuant to this Consent Order shall be submitted in .pdf and in manipulable electronic format to the following email addresses: Winiecki.Eric@epa.gov, Fuentes.Rene@epa.gov, and MacDonald.Jennifer@epa.gov. Hard copies shall also be mailed to the EPA's Project Coordinator in accordance with Paragraph 13.c. and to Rene Fuentes in the Office of Environmental Assessment, and Jennifer MacDonald in the Office of Regional Counsel at the following address:

U.S. Environmental Protection Agency, Region 10
1200 6th Avenue, Suite 900
Seattle, WA 98101-3140

16. Each submission shall include reference to the docket number of this Consent Order.

17. All plans, reports, notices, or other documents submitted by Respondents pursuant to this Consent Order, which make any representation concerning Respondents' compliance or noncompliance with any requirement of this Consent Order, shall be accompanied by the following statement signed by Respondents:

> "I certify under the penalty of law that this document and all attachments were prepared by me or under my direction or supervision in accordance with a system designed to assure that qualified personnel gathered and evaluated the information submitted. Based on my inquiry of any and all persons directly responsible for gathering and analyzing the information obtained, I certify that the information contained in or accompanying this submittal is to the best of my knowledge and belief, true, accurate and complete. As to those identified portion(s) of this submittal for which I cannot personally verify the accuracy, I certify that this submittal and all attachments were prepared in accordance with procedures designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those directly responsible for gathering the information, or the immediate supervisor of such person(s), the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

18. The certification shall also include the name, title, date and signature of the person or persons completing the certification.

VIII. ADDITIONAL WORK

19. Any of the Respondents may propose that certain tasks, including investigatory work, engineering evaluation, or procedure/methodology modifications, are necessary in addition to or in lieu of the tasks included in any EPA approved plan, to meet the purposes set forth in this Consent Order, including the SOW. Upon EPA's approval of a work plan, the Respondent or Respondents shall implement such work plan in accordance with the schedule and provisions contained therein.

IX. ACCESS TO PROPERTY AND INFORMATION

20. Property

a. Respondents shall, commencing on the Effective Date, provide EPA and its representatives, including contractors, with access at all reasonable times to property owned or possessed by Respondents for the purpose of

conducting any activity related to this Consent Order. EPA shall endeavor to provide notice to Respondents of its need for access at least three (3) days in advance.

b. Where any action under this Consent Order is to be performed in areas owned by or in possession of someone other than Respondents, Respondents shall use best efforts to obtain all necessary access within the time period specified in the SOW. Respondents shall immediately notify EPA if after using its best efforts it is unable to obtain such access. Respondents shall describe in writing their efforts to obtain access.

c. Notwithstanding, any provision of this Consent Order, the EPA retains all of its access authorities and rights, as well as all of its rights to require land use restrictions, including enforcement authorities related thereto, under SDWA, CERCLA, RCRA and any other applicable statutes or regulations.

21. Information

a. Respondents shall provide to the EPA, upon request, copies of all documents and information within their possession or control or that of their contractors, employees or agents relating to the implementation of this Consent Order, including, but not limited to, sampling, analysis, chain of custody records, manifests, trucking logs, receipts, reports, correspondence, or other documents or information relating to the Work.

b. Respondents may assert business confidentiality claims covering part or all of the documents or information submitted to the EPA under this Consent Order to the extent permitted by and in accordance with 40 C.F.R. § 2.203(b). Documents or information determined to be confidential by the EPA will be afforded the protection specified in 40 C.F.R Part 2, Subpart B. If no claim of confidentiality accompanies documents or information when they are submitted to EPA, or if EPA has notified Respondents that the documents or information are not confidential under the standards of 40 C.F.R Part 2, Subpart B, the public may be given access to such documents or information without further notice to Respondents.

c. Respondents may assert that certain documents, records and other information are privileged under the attorney-client privilege or any other privilege or protection recognized by Washington or federal law. If Respondents assert such a privilege in lieu of providing documents, they shall provide the EPA with the following: i) the title of the document, record or information; ii) the date of the document, record or information; iii) the name and title of the author of the document, record or information; iv) the name and title of each addressee and recipient; v) a description of the contents of the document, record or information; and vi) the privilege asserted by

Respondents. However, no documents, reports or other information created or generated pursuant to the requirements of this Consent Order shall be withheld on the grounds that they are privileged.

d. No claim of confidentiality shall be made with respect to any data, including, but not limited to, all sampling, analytical, monitoring, hydrogeologic, scientific, chemical, or engineering data, or any other documents or information evidencing conditions at or around the Dairy Facilities relating to the Work.

X. RECORD RETENTION

22. Until ten (10) years after Respondents' receipt of the EPA's notification pursuant to Section XVI (Termination and Satisfaction), Respondents shall preserve and retain all non-identical copies of records and documents (including records or documents in electronic form) now in its possession or control or which come into its possession or control that relate in any manner to the performance of the Work, regardless of any corporate or business retention policy to the contrary. Until ten (10) years after Respondents' receipt of the EPA's notification pursuant to Section XVI (Termination and Satisfaction), each Respondent shall also instruct its contractors, employees and agents to preserve all documents, records, and information of whatever kind, nature or description relating to the performance of the Work.

23. At the conclusion of this document retention period, Respondents shall notify the EPA at least ninety (90) days prior to the destruction of any such records or documents, and, upon request by the EPA, Respondents shall deliver any such records or documents to the EPA. Respondents may assert that certain documents, records and other information are privileged under the attorney-client privilege or any other privilege or protection recognized by Washington or federal law. If Respondents assert such a privilege in lieu of providing documents, it shall provide the EPA with the following: a) the title of the document, record or information; b) the date of the document, record or information; c) the name and title of the author of the document, record or information; d) the name and title of each addressee and recipient; e) a description of the contents of the document, record or information; and f) the privilege asserted by Respondents. However, no documents, reports or other information created or generated pursuant to the requirements of this Consent Order shall be withheld on the grounds that they are privileged.

XI. DISPUTE RESOLUTION

24. Unless otherwise expressly provided for in this Consent Order, the dispute resolution procedures of this Section shall be the exclusive mechanism for resolving disputes arising under this Consent Order. The Parties shall attempt to resolve any disagreement concerning this Consent Order expeditiously and informally.

25. If Respondents object to any EPA action taken pursuant to this Consent Order, Respondents shall notify the EPA in writing of its objection within ten (10) days of such action, unless the objection has been resolved informally. The EPA and Respondents shall have thirty (30) days from EPA's receipt of Respondents' written objections to resolve the dispute through formal negotiations (the "Negotiation Period"). The Negotiation Period may be extended at the sole discretion of the EPA.

26. Any agreement reached by the Parties pursuant to this Section shall be in writing and shall, upon signature by both Parties, be incorporated into and become an enforceable part of this Consent Order. If the Parties are unable to reach an agreement within the Negotiation Period, the Director of the Office of Compliance and Enforcement, EPA Region 10, will issue a written decision on the dispute. This decision shall be incorporated into and become an enforceable part of this Consent Order. Respondents' obligations under this Consent Order shall not be tolled by submission of any objection for dispute resolution under this Section. Following resolution of the dispute, as provided by this Section, Respondents shall fulfill the requirement that was the subject of the dispute in accordance with the agreement reached or with the EPA's decision, whichever occurs.

XII. FORCE MAJEURE

27. Respondents agree to perform all requirements of this Consent Order within the time limits established under this Consent Order, unless the performance is delayed by a force majeure. For purposes of this Consent Order, a force majeure is defined as any event arising from causes beyond the control of the Respondents, or of any entity controlled by Respondents, including but not limited to their contractors and subcontractors, which delays or prevents performance of any obligation under this Consent Order despite the Respondents' best efforts to fulfill the obligation. Force majeure does not include increased cost of performance, changed economic circumstances, normal climatic conditions, or failure to obtain federal, state or local permits if such failure is due to unjustified delay or negligence on the part of Respondents.

28. If any event occurs or has occurred that may delay the performance of any obligation under this Consent Order, whether or not caused by a force majeure event, Respondents shall notify the EPA orally within ten (10) days of when Respondents first had knowledge that the event might cause a delay. Within ten (10) days thereafter, Respondents shall provide to the EPA in writing an explanation and description of the reasons for the delay; a schedule for implementation of any measures to be taken to prevent or mitigate the delay or the effect of the delay; Respondents' rationale for attributing such delay to a force majeure event if they intend to assert such a claim; and a statement as to whether, in the opinion of Respondents, such event may cause or contribute to an endangerment to public health. Failure to comply with the above requirements regarding an event shall preclude Respondents from asserting any claim of

force majeure regarding that event, provided, however, that if the EPA, despite the late notice, is able to assess to its satisfaction whether the event is a force majeure under Paragraph 27 and whether Respondents have exercised their best efforts under Paragraph 27, the EPA may, in its unreviewable discretion, excuse in writing Respondents' failure to submit timely notices under this Paragraph.

29. If the EPA agrees that the delay, or anticipated delay is attributable to a force majeure event, the time for performance of the obligations under this Consent Order that are affected by the force majeure event will be extended by the EPA for such time as is necessary to complete those obligations. If the EPA does not agree that the delay or anticipated delay has been or will be caused by a force majeure event, the EPA will notify Respondents in writing of its decision. If the EPA agrees that the delay is attributable to a force majeure event, EPA will notify Respondents in writing of the length of the extension, if any, for performance of the obligations affected by the force majeure event. If the EPA disagrees that the delay or anticipated delay has been or will be caused by a force majeure event, then Respondents have the right to invoke the Dispute Resolution provisions of Section XI above to resolve the force majeure event issue. Respondents shall also have the right to invoke the Dispute Resolution provisions if they disagree with the EPA's decision as to the length of extension, if any, for performance of the obligations affected by the force majeure event. An extension of the time for performance of obligations affected by the force majeure shall not, of itself, extend the time for performance of any other obligation.

XIII. STIPULATED PENALTIES

30. Each Respondent shall be liable to the EPA for stipulated penalties in the amounts set forth below for its failure to comply with the requirements of this Consent Order as specified below, unless excused under Section XII (Force Majeure). "Compliance" by each Respondent shall include completion of the activities required for each Respondent under this Consent Order in accordance with this Consent Order, any plan or other document approved by the EPA, and all applicable requirements of law, and within the specified time schedules established by and approved under this Consent Order.

31. Stipulated Penalty Amounts – Work, including documents. The following stipulated penalties shall accrue per violation per day for a Respondent's failure to complete the actions called for in the Statement of Work in the time period or in the manner required by the EPA-approved document or schedule, and for failure to submit timely or adequate reports or other written documents:

Penalty Per Violation Per Day	Period of Noncompliance
$ 300	1st through 14th day
$ 500	15th through 30th day
$ 1,000	31st day and beyond

32. Stipulated Penalty Amounts – Other. The following stipulated penalties shall accrue per violation per day for a Respondent's failure to comply with any other requirement of this Consent Order, including for example, select a Project Coordinator and contractor, and in the time period or manner required pursuant to this Consent Order.

Penalty Per Violation Per Day	Period of Noncompliance
$ 100	1st through 14th day
$ 300	15th through 30th day
$ 500	31st day and beyond

33. All penalties shall begin to accrue on the day after the complete performance is due or the day a violation occurs, and shall continue to accrue through the final day of the correction of the noncompliance or completion of the activity. However, stipulated penalties shall not accrue: a) with respect to a deficient submission under Section VII (Work to be Performed), during the period, if any, beginning on the thirty-first (31st) day after the EPA's receipt of such submission until the date that the EPA notifies Respondent of any deficiency; and b) with respect to a decision by the Director of the Office of Compliance and Enforcement, EPA Region 10, under Paragraph 26 of Section XI (Dispute Resolution), during the period, if any, beginning on the twenty-first (21st) day after the Negotiation Period begins until the date that the Director of the Office of Compliance and Enforcement, EPA Region 10, issues a final decision regarding such dispute. Nothing in this Consent Order shall prevent the simultaneous accrual of separate penalties for separate violations of this Consent Order.

34. Following the EPA's determination that a Respondent has failed to comply with a requirement of this Consent Order, the EPA may give Respondent written notification of the failure and describe the noncompliance. The EPA may send Respondent a written demand for payment of the penalties. However, penalties shall accrue as provided in the preceding Paragraph regardless of whether the EPA has notified Respondent of a violation.

35. All penalties accruing under this Section shall be due and payable to the EPA within thirty (30) days of Respondent's receipt from the EPA of a demand for payment of the penalties, unless Respondent invokes the dispute resolution procedures under Section XI (Dispute Resolution). All payments to the EPA under this Section shall be paid by certified or cashier's check(s) made payable to the EPA shall be mailed to:

U.S. Environmental Protection Agency
Fines and Penalties
Cincinnati Finance Center
PO Box 979077
St. Louis, MO 63197-9000

All payments shall also indicate that the payment is for stipulated penalties, and shall reference EPA Region 10 and the EPA Docket Number SDWA-10-2013-0080, and the name and address (city, state and zip code), point of contact person and phone number of the party making payment. Copies of check(s) paid pursuant to this Section, and any accompanying transmittal letter(s), shall be sent to the EPA as provided in Paragraph 15.

36. The payment of penalties shall not alter in any way Respondent's obligation to complete performance of the Work required under this Consent Order.

37. Penalties shall continue to accrue during any dispute resolution period, but need not be paid until fifteen (15) days after the dispute is resolved by agreement or by receipt of the EPA's decision.

38. If a Respondent fails to pay stipulated penalties when due, the EPA may institute proceedings to collect the penalties, as well as Interest. Respondent shall pay Interest on the unpaid balance, which shall begin to accrue on the date of demand made by EPA. Nothing in this Consent Order shall be construed as prohibiting, altering, or in any way limiting the ability of EPA to seek any other remedies or sanctions available by virtue of Respondent's violation of this Consent Order or of the statutes and regulations upon which it is based, including, but not limited to, penalties pursuant to Section 1431(b) of the SDWA, 42 U.S.C. § 300i(b). Notwithstanding, any other provision of this Section, the EPA may, in its unreviewable discretion, waive any portion of stipulated penalties that have accrued pursuant to this Consent Order.

XIV. RESERVATIONS AND GENERAL PROVISIONS

39. Nothing in this Consent Order shall limit the power and authority of the EPA or the United States to take, direct, or order all actions necessary to protect public health, welfare or the environment.

40. The EPA hereby reserves all of its statutory and regulatory powers, authorities, rights, and remedies, both legal and equitable, which may pertain to Respondents' failure to comply with any of the requirements of this Consent Order, including without limitation the assessment of penalties under 1431(b) of the SDWA, 42 U.S.C. § 300i(b). This Consent Order shall not be construed as a covenant not to sue, release, waive, or limit any rights, remedies, powers, and/or authorities, civil or criminal, which the EPA has under the SDWA, or any other statutory, regulatory, or common law authority of the United States. Nothing in this Consent Order shall diminish, impair, or otherwise adversely affect the authority of the EPA to enforce the provisions of this Consent Order.

41. This Consent Order shall not limit or otherwise preclude the EPA from taking additional enforcement action pursuant to the SDWA, or any other available legal

authority, should the EPA determine that such action is warranted and necessary to protect human health and the environment.

42. All actions required to be taken pursuant to this Consent Order shall be undertaken in accordance with the requirements of all applicable local, State, and federal laws and regulations. Respondents shall obtain or cause its representatives to obtain all permits and approvals required under such laws and regulations to perform work pursuant to this Consent Order and shall submit timely applications and requests for any such permits and approvals. Respondents may seek relief under the provisions of Section XII (Force Majeure) for any delay in the performance of the Work resulting from a failure to obtain, or a delay in obtaining, any permit or approval required for the Work, provided that they have submitted timely and complete applications and taken all other actions necessary to obtain all such permits or approvals.

43. Respondents agree not to assert any claims or causes of action against the United States, or its contractors or employees, with respect to the Work or this Consent Order, including, but not limited to any claim under the United States Constitution, the Washington Constitution, the Tucker Act, 28 U.S.C. § 1491, the Equal Access to Justice Act, 28 U.S.C. § 2412, Section 1448 of the SDWA, 42 U.S.C. § 300j-7, as amended, or at common law. Respondents shall indemnify and save and hold harmless the EPA, its agents, and employees from any and all claims or causes of action arising solely from, or on account of, acts or omissions of Respondents or its officers, employees, agents, independent contractors, receivers, trustees, and/or assigns. This indemnification shall not be construed in any way as affecting or limiting the rights or obligations of Respondents, the EPA, or the United States under their various contracts.

44. The United States shall not be held out as a party to any contract entered into by or on behalf of Respondents in carrying out activities pursuant to this Consent Order. Neither Respondents nor any such contractor shall be considered an agent of the United States.

XV. MODIFICATIONS

45. If Respondents seek permission to deviate from any approved document or schedule or the Statement of Work, Respondents' Project Coordinator shall submit a written request to the EPA for approval outlining the proposed modification and its basis. Respondents may not proceed with the requested deviation until receiving oral or written approval from the EPA's Project Manager. Any oral modification will be memorialized in writing by the EPA promptly, but shall have as its effective date the date of the EPA Project Coordinator's oral direction. Any other requirements of this Consent Order may be modified in writing by mutual agreement of the Parties.

46. No informal advice, guidance, suggestion, or comment by the EPA's Project Coordinator or other EPA representatives regarding reports, plans, specifications,

schedules, or any other writing submitted by Respondents shall relieve Respondents of their obligation to obtain any formal approval required by this Consent Order, or to comply with all requirements of this Consent Order, unless it is formally modified.

XVI. TERMINATION AND SATISFACTION

47. The provisions of this Consent Order, with the exception of Section X (Record Preservation) and actions required to continue as specified in the Statement of Work, shall terminate upon Respondents' receipt of written notice from the EPA that Respondents have demonstrated that the terms of this Consent Order have been satisfactorily completed.

XVII. INTEGRATION/APPENDICES

48. This Consent Order and its appendices constitute the final, complete and exclusive agreement and understanding among the Parties with respect to the settlement embodied in this Consent Order. The Parties acknowledge that there are no representations, agreements or understandings relating to the settlement other than those expressly contained in this Consent Order. The following appendices are attached to and incorporated into this Consent Order:

A – Aerial Photo and Site Diagram

B – Statement of Work

XVIII. EFFECTIVE DATE

49. This Consent Order shall be effective on the day that it is signed by the Director of the Office of Compliance and Enforcement in Region 10 of EPA, who shall be the last signatory to this Consent Order.

It is so AGREED:

For Cow Palace, LLC:

By: R. William Dolsen
Signature

March 5, 2013
Date

R. William Dolsen
Print Name

President
Print Title or Affiliation

For D & A Dairy, LLC (also known as D and A Dairy, L.L.C.), and George DeRuyter & Son Dairy, L.L.C.:

By: Dan DeRuyter
Signature

3/5/13
Date

Dan DeRuyter
Print Name

member
Print Title or Affiliation

For George & Margaret, L.L.C.:

By: George De Ruyter
Signature

3-5-13
Date

George De Ruyter
Print Name

Member
Print Title or Affiliation

For Liberty Dairy, LLC and its associated Dairy Facility H&S Bosma Dairy:

By: _____ March 5th, 2013
Signature **Date**

Henry Bosma
Print Name

Partner
Print Title or Affiliation

It is so ORDERED and Agreed:

For the U.S. Environmental Protection Agency

BY: _____ **DATE:** 3/19/2013

Edward J. Kowalski, Director
Office of Compliance and Enforcement
U.S. Environmental Protection Agency, Region 10

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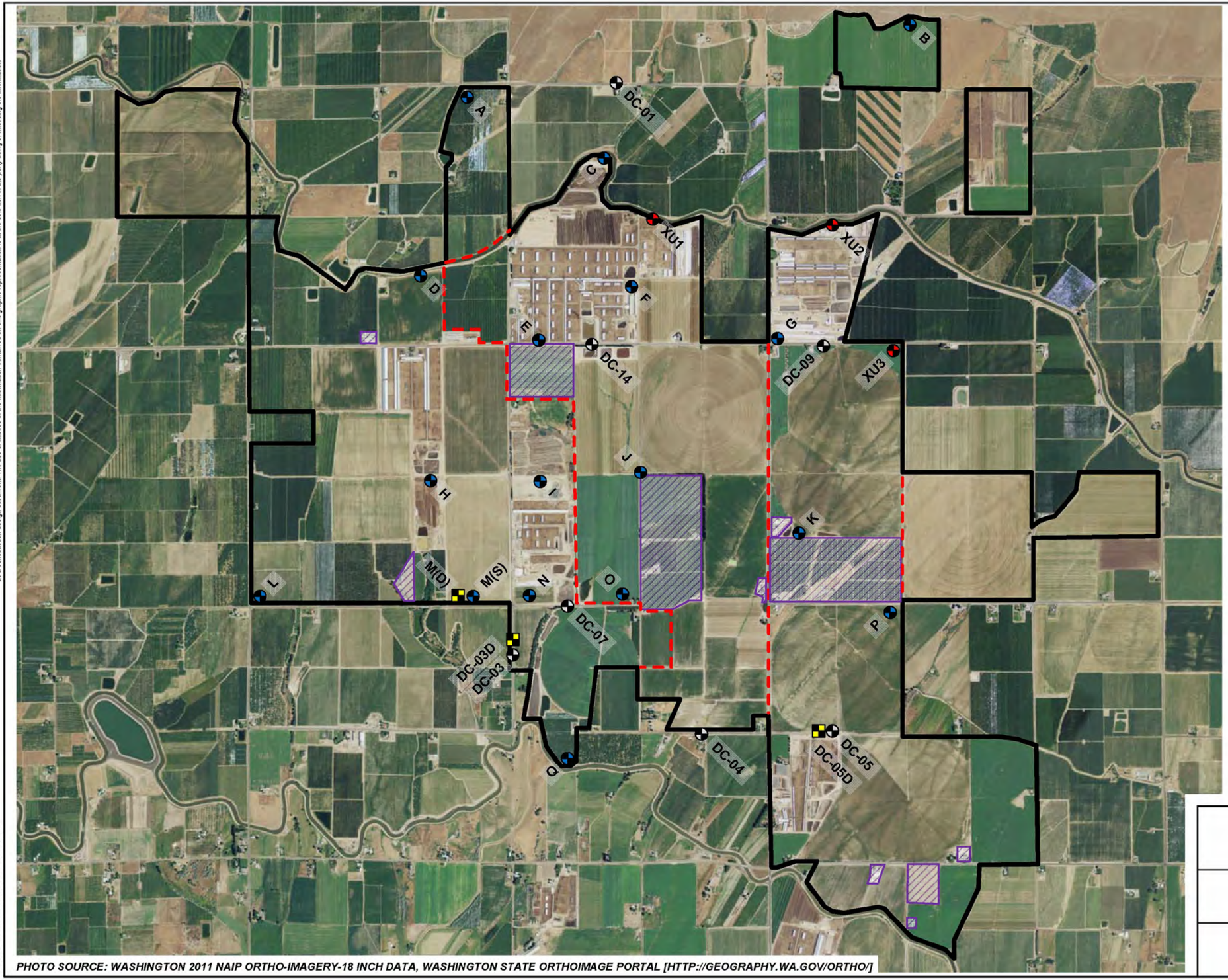

LEGEND

- APPROXIMATE BOUNDARY OF DAIRY FACILITIES
- EXISTING EPA WELL (7) (LOCATION APPROXIMATE)
- "SHALLOW" SURFICIAL AQUIFER MONITORING WELL (17)
- "DEEP" SURFICIAL AQUIFER MONITORING WELL (3)
- ADDITIONAL UPGRADIENT "SHALLOW" SURFICIAL AQUIFER MONITORING WELL [AT RESPONDENTS DISCRETION] (3)
- LAND WITHIN BOUNDARY NOT OWNED OR OPERATED BY RESPONDENTS
- RESPONDENTS OWNERSHIP BOUNDARIES

APPROXIMATE SCALE

0 2,000

FEET

PHOTO SOURCE: WASHINGTON 2011 NAIP ORTHO-IMAGERY-18 INCH DATA, WASHINGTON STATE ORTHOIMAGE PORTAL [HTTP://GEOGRAPHY.WA.GOV/ORTHO/]

SDWA-10-2013-0080

APPENDIX A

AERIAL PHOTOGRAPH

SDWA-10-2013-0080 APPENDIX A

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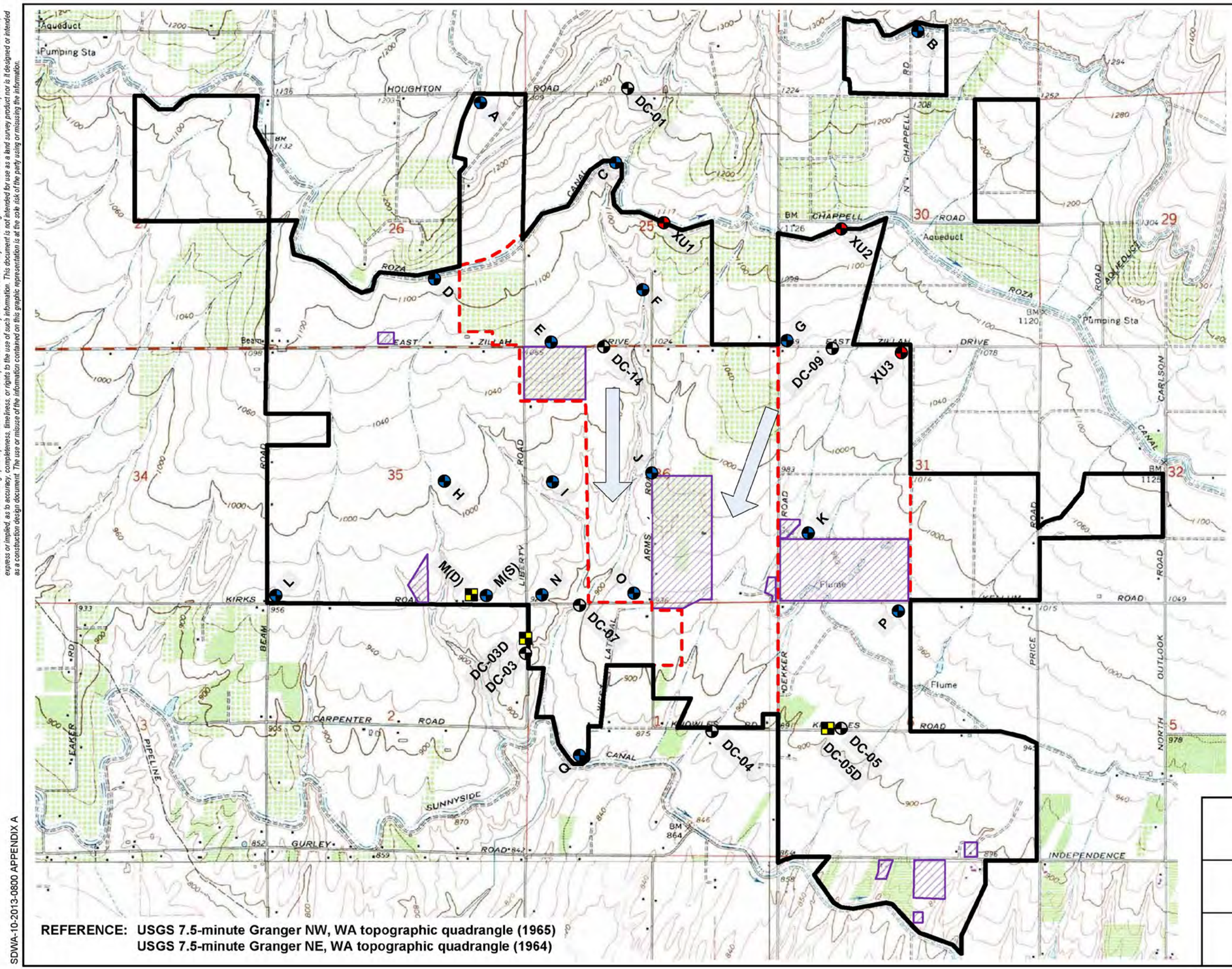

LEGEND

- APPROXIMATE BOUNDARY OF DAIRY FACILITIES
- EXISTING EPA WELL (7) (LOCATION APPROXIMATE)
- "SHALLOW" SURFICIAL AQUIFER MONITORING WELL (17)
- "DEEP" SURFICIAL AQUIFER MONITORING WELL (3)
- ADDITIONAL UPGRADIENT "SHALLOW" SURFICIAL AQUIFER MONITORING WELL [AT RESPONDENTS DISCRETION] (3)
- GENERAL SURFICIAL AQUIFER GROUNDWATER FLOW DIRECTION
- LAND WITHIN BOUNDARY NOT OWNED OR OPERATED BY RESPONDENTS
- RESPONDENTS OWNERSHIP BOUNDARIES

APPROXIMATE SCALE

0 2,000

FEET

SDWA-10-2013-0080

APPENDIX A

SITE DIAGRAM

SDWA-10-2013-0800 APPENDIX A

APPENDIX B
STATEMENT OF WORK
ADMINISTRATIVE ORDER ON CONSENT
EPA DOCKET NO. SDWA-10-2013-0080

I. INTRODUCTION AND PURPOSE

This Statement of Work (SOW) defines the response actions and obligations that Respondents are required to perform to implement the work ("Work") under the Administrative Order on Consent, Docket No. SDWA-10-2013-0080 (the "Consent Order"), issued by the U.S. Environmental Protection Agency (EPA) to address sources of nitrate contamination in groundwater near and downgradient of Respondents' Dairy Facilities. All Work described in this Statement of Work shall be conducted in accordance with local, state, and federal regulations. The goal of this Consent Order is to achieve drinking water quality that meets the EPA maximum contaminant level ("MCL") for nitrate of 10 mg/L in the drinking water aquifer beneath and downgradient of the Dairy Facilities. Attachment 1 to this SOW is a Schedule of Tasks. In the event of conflicts between the Schedule of Tasks and the SOW, the SOW shall control.

II. OBJECTIVES

The objectives of this Statement of Work are to:

A. Expeditiously provide a permanent, safe alternative drinking water supply to residents using private drinking water wells that exceed the MCL for nitrate (nitrate as nitrogen or "NO_3-N") and are on, or within one mile downgradient of the Dairy Facilities.

B. Take specific actions to further control potential sources of nitrogen at the Dairy Facilities.

C. Establish a network of monitoring wells to measure the effectiveness of the nitrogen source reduction actions on water quality in the shallow, alluvial aquifer which serves as an underground source of drinking water.

D. Ensure effective nutrient management at the Dairy Facilities to reduce the introduction of nitrate to an underground source of drinking water.

III. REQUIRED ACTIVITIES AND SUBMISSIONS

As specified below, most of the Work required of Respondents by this Consent Order shall be conducted pursuant to EPA-approved plans. Each plan shall describe the activities to be performed by Respondents. Respondents are also required to submit reports relating to the Work to EPA for review and approval, as specified below.

A. Quality Assurance Project Plan

1. Before Respondents commence any monitoring, sampling, field measurements, or laboratory sample analysis under this Consent Order, Respondents shall submit to the EPA a Quality

Assurance Project Plan ("QAPP") that shall ensure that all information, sample collection, analytical data and resulting decisions are technically sound, scientifically valid, and properly administered. Each QAPP submitted by Respondents shall be consistent with the Consent Order, including the SOW, and applicable EPA guidance documents. Each QAPP shall describe all data collection activities, contain a schedule for activities to be conducted pursuant to the QAPP, and describe and provide a schedule for submission of the report of the Work to be conducted in accordance with the QAPP. All data collected shall be submitted to the EPA in an electronic, manipulable format. Respondents shall ensure that all field methodologies utilized in collecting samples for analysis pursuant to the Consent Order are conducted in accordance with the procedures set forth in the QAPP approved by the EPA.

2. For each sampling activity required, Respondents shall submit to the EPA a QAPP that 1) describes the project objectives and organization, functional activities, and quality assurance and quality control ("QA/QC") protocols that shall be used to achieve the desired data quality objectives ("DQOs"), and 2) ensures that sample collection and analytical activities are conducted in accordance with technically acceptable protocols and that the data generated will meet the established DQOs. Each QAPP shall be prepared in accordance with the "Guidance for Quality Assurance Project Plans (QA/G-5)" (EPA/240/R-02/009, December 2002), and "EPA Requirements for Quality Assurance Project Plans (QA/R-5)" (EPA/240/B-01/003, March 2001, reissued May 2006), and any amendments to these documents. The project DQOs should be developed for use in the QAPP in accordance with the "Guidance on Systematic Planning Using the Data Quality Objectives Process (QA/G-4)" (EPA/240/B-06/001, February 2006). The QAPP shall be written so that a field sampling team unfamiliar with the project would be able to gather the samples and field information required.

3. To provide quality assurance and maintain quality control, Respondents shall:

a. Use only a certified drinking water laboratory to analyze the groundwater samples for drinking water contaminants.[1] For the non-drinking water contaminants and the application field samples, use a laboratory that has been accredited by the State of Washington, National Environmental Laboratory Accreditation Program (NELAP) or equivalent as determined by the EPA. Application fields are those fields on which the Respondents apply solid or liquid animal waste.

b. Provide written instructions to each laboratory to be used by Respondents to perform analyses in accordance with approved analytical methods. Accepted methods for the analytes of interest per matrix for this project will align with DQOs approved by the EPA and shall consist of, at a minimum, the following:

Groundwater samples:

- Nitrate as Nitrogen (NO_3-N) – EPA Method 300.0
- Nitrite as Nitrogen (NO_2-N) – EPA Method 300.0
- Ammonia – EPA Method 350.1
- Total Phosphorus – EPA Method 365.1
- Total Kjeldahl Nitrogen – EPA Method 351.2
- Inorganic Anions (i.e., chloride, fluoride, sulfate) – EPA Method 300.0
- Metals (i.e., calcium, potassium, magnesium, sodium) – EPA Method 200.7

[1] See http://water.epa.gov/scitech/drinkingwater/labcert/analyticalmethods.cfm#approved.

- Alkalinity (Total and Bicarbonate) – Standard Method 2320B

Application field samples:

- Ammonia (NH_3)
- Nitrate as Nitrogen
- Phosphorus
- Potassium
- pH
- Electrical Conductivity
- Soil Organic Matter

Respondents shall propose, for EPA approval, analytical methods for application fields consistent with the goals of the Work. Respondents may use analytical methods other than those listed above with prior approval from the EPA.

c. Instruct the laboratory in writing to allow EPA personnel and its authorized representatives access to the laboratory and personnel utilized by Respondents for analyses.

d. Notify EPA not less than fourteen (14) days in advance of any sample collection or other field activity. At the request of the EPA, Respondents shall allow split or duplicate samples to be taken by the EPA or its authorized representatives, of any samples collected by Respondents with regard to the Work or pursuant to the implementation of this Consent Order. In addition, the EPA or its authorized representatives shall have the right to take any additional samples that the EPA deems necessary.

e. All results of measurements, sampling, tests, modeling, or other data (including raw data) generated by Respondents, or on Respondents' behalf, related to this Consent Order and during the period that this Consent Order is in effect, shall be incorporated in the report of the data collection activity or field activity submitted to the EPA. Except as specified below:

(1) Respondents shall submit validated groundwater nitrate analytical results to the EPA within 30 days of sample collection;

(2) Respondents shall submit a report of the data collection or other field activity and all validated data within 60 days of the date of last sample collection or field activity, whichever is later.

These requirements must be reflected in the QAPP schedule.

B. Health and Safety Plan

At least 14 days in advance of initial field work for each task, including sampling domestic water and provision of alternative drinking water, Respondents shall submit to EPA a Health and Safety Plan ("HASP") that is compliant with the Occupational Safety and Health Act and its implementing regulations. The HASP shall identify specific to each task to be conducted: physical and chemical hazards that workers may encounter conducting Work under the Consent Order, identify how the safety of personnel will be ensured, and shall name a qualified site safety officer. The HASP shall identify any personal protective equipment that personnel shall wear during different site tasks,

including specific materials or properties of materials necessary to ensure appropriate protection. The proper safety equipment and instrumentation must be on site during all project activities. Respondents shall submit revised HASPs as necessary to address new field tasks.

C. Public Involvement

Within 30 days of the Effective Date, Respondents shall notify EPA of their interest in participating in the public involvement process.

D. Provision of Water

1. As described below, Respondents shall offer to provide reverse osmosis (RO) treatment systems, or other alternative water if mutually approved by EPA and Respondents, to each residence where testing shows that the drinking water supply exceeds the nitrate MCL of 10 mg/L and that is within:

a. the boundary of the Dairy Facilities (depicted on Appendix A to the Consent Order), or

b. one mile downgradient of the boundary of the Dairy Facilities (See Figure 1), if that residence does not already have a RO treatment system or other alternative water.

2. Within 21 days of the Effective Date, Respondents shall submit to EPA a Residential Well Sampling QAPP for testing residential drinking water wells. The Residential Well Sampling QAPP may include an option of Hach nitrate test strips for water well screening. The Residential Well Sampling QAPP shall specify that if Hach nitrate test strips are used, then for each well where the Hach test strip indicates 5 mg/L nitrate or above, Respondents shall collect a sample and submit that sample to a laboratory for analysis. The Residential Well Sampling QAPP shall include a schedule of activities related to accomplishing this task.

3. Within 60 days of EPA approval of the Residential Well Sampling QAPP, Respondents shall endeavor to test each drinking water well at the residences situated within the boundary of the Dairy Facilities and those residences that are located within one mile downgradient of the Dairy Facilities (Figure 1). After providing advance notice via postcard, Respondents shall make at least one visit per house. If no one is home at the time of Respondents' visit, then Respondents shall leave a note, pre-approved by EPA, that contains sufficient information regarding the reason for the visit, an invitation for response by occupants, and contact information for both EPA and the Respondents.

4. Results of testing using the Hach test strip shall be provided to the resident at the time of the testing, as well as documented in writing and included in the report required below in Paragraph 6. Preliminary laboratory results shall be submitted to EPA within 14 days from the date of the sample collection. Validated laboratory analytical results for those drinking water wells from which Respondents collected a sample to send to a laboratory must be provided to each resident and to the EPA within 21 days of sample collection.

5. Within 30 days of submittal to the EPA of the validated laboratory analytical data for drinking water wells, for each residence where the nitrate concentration exceeds 10 mg/L and

the occupant accepts Respondents' offer for alternative water, Respondents shall supply that residence with a RO treatment system or some other form of alternative water approved by the EPA.

6. Within 150 days of EPA approval of the Residential Well Sampling QAPP, Respondents shall submit a report to the EPA documenting the efforts made by Respondents, including identifying those residences contacted by Respondents, results of testing the well water, and whether the residence received a RO treatment system, already had a RO treatment system, did not respond to the offer, or rejected the offer.

7. So long as the Consent Order is in effect, if a resident located within the boundary of the Dairy Facilities (Appendix A to the Consent Order) or within the one mile radius as depicted on Figure 1 makes a request to EPA or Respondents for testing and a RO treatment system, then Respondents shall test the drinking water well and provide a RO treatment system to such resident if the nitrate concentration exceeds 10 mg/L.

8. For every alternative drinking water supply provided by Respondents, and for any property that already has a point-of-use system installed to treat drinking water for nitrate, Respondents shall provide professional maintenance service for that alternative water supply if a professional maintenance service for the alternative water supply is not already being provided.

9. Respondents shall continue to provide and maintain the alternative water supply so long as the property is occupied, and will resume provision and maintenance of alternative water supply if the property is occupied after a vacant period and Respondents are made aware of the re-occupation, regardless of whether there is a change in ownership or occupancy of the property.

10. Respondents may discontinue provision of alternative water supply to a residence if Respondents demonstrate to EPA that the nitrate level in a drinking water well is consistently below the MCL over a two-year period, as measured on a quarterly basis (8 quarters).

E. Groundwater Monitoring

1. Groundwater Monitoring QAPP

Within 60 days of the Effective Date, Respondents shall submit to EPA a Groundwater Monitoring QAPP. The objectives of the Groundwater Monitoring QAPP are to establish a baseline of groundwater quality information at the Dairy Facilities to evaluate whether actions taken to reduce nitrogen loading are effective over time, and to collect information to supplement and verify existing information on the environmental setting at the Dairy Facilities, including further clarification of the hydraulic gradient of the aquifer beneath the Dairy Facilities. The components of the Groundwater Monitoring QAPP shall include:

a. Environmental Setting

The Groundwater Monitoring QAPP shall provide available information regarding the environmental setting at the Dairy Facilities. In addition, the Groundwater Monitoring QAPP shall include provisions to collect information to supplement and verify existing information on the environmental setting at the Dairy Facilities. Information collected in accordance with the Groundwater Monitoring QAPP shall be

reported in the Groundwater Monitoring Installation Report and the Groundwater Monitoring Data Reports. The following shall be provided regarding hydrogeology:

(1) A short description of regional and site-specific geologic and hydrogeologic characteristics affecting groundwater flow and contaminant migration beneath the Dairy Facilities. This description shall include, but not be limited to, regional and site-specific stratigraphy. At a minimum, this shall include a detailed lithologic description of the area of the Dairy Facilities from the surface to fifteen feet below the water table of the drinking water aquifer at the time of monitoring well installation.

(2) A description of the regional and site-specific hydrogeologic flow regime for the alluvial aquifer. At a minimum, the groundwater hydrogeologic flow description shall include water level contour and/or potentiometric surface maps using measurements from EPA approved wells. These maps shall include contour maps that incorporate representative data obtained from water level or fluid pressure measurements from all groundwater monitoring wells used to fulfill the requirements of this Consent Order.

(3) A description of human influences, including off-site structures and conditions, that may affect the hydrogeology of and migration of any contaminants at or from the Dairy Facilities, identifying:

(a) Active and inactive local water withdrawal wells with the potential to affect groundwater flow at the Dairy Facilities, and approximate pumping schedules, and;

(b) Structures including, but not limited to, pipelines, french drains, creeks, ditches, unlined ponds, septic tanks, NPDES outfalls, sewer pipes, stormwater drains, tile drains and wastewater or surface water retention areas, etc.

(4) A description of surface water flow regimes, both regional and on/near the Dairy Facilities, based on present and historical conditions since operations began on the Dairy Facilities. At a minimum, this description must include a description and map of surface water channels (named or unnamed) as identified in published reports by the United States Geologic Survey (USGS) regarding Yakima County.

b. Groundwater Monitoring Well Installation

The Groundwater Monitoring QAPP shall include a conceptual site model in accordance with EPA guidance, DQOs, and a detailed description of the monitoring well installation and groundwater sampling and analysis. Data to be collected shall include the date, time and location of sampling, environmental conditions during sampling, media sampled, field parameters, contaminant concentrations, and the identity of the individuals performing the sampling and analysis. The Groundwater Monitoring QAPP shall, at a minimum, provide the following information:

(1) Provisions for installation of all groundwater monitoring wells needed to establish a baseline of nitrate contamination in the underlying aquifer. The Groundwater Monitoring QAPP shall define the design and installation procedures to be used. The proposed groundwater monitoring system and monitoring well network shall be capable of operating for a period

of time sufficient to provide representative groundwater samples during the implementation of actions to control nitrogen migration to groundwater at the Dairy Facilities pursuant to this Consent Order.

(2) The conceptual site model shall include a figure and a flow chart developed from available information. The conceptual site model shall be consistent with the following guidance document: Environmental Cleanup Best Management Practices: Effective Use of the Project Life Cycle Conceptual Site Model, EPA 542-F-11-011, July 2011. The conceptual site model shall be periodically updated as appropriate, based on new information.

(3) As the wells are drilled, the soil borings shall be logged by a qualified, state-registered geologist. Respondents shall submit the credentials of the qualified, state-registered geologist to EPA in accordance with Section VII.13.a. of the Consent Order. The Groundwater Monitoring QAPP shall document the procedures to be used in making the above determinations (e.g., well design, well construction, etc.).

(4) Lithologic descriptions shall include, but not be limited to, items such as grain size and sorting, depositional environment, and description according to the Unified Soil Classification System.

(5) The monitoring well data shall enable development of a baseline of nitrate concentrations in the drinking water aquifer against which progress in addressing nitrate contamination can be measured. At a minimum, Respondents shall install groundwater monitoring wells at the approximate locations indicated on Appendix A, or at alternative locations approved by EPA. Well locations must be sufficient to meet EPA approved DQOs.

(6) The shallow monitoring wells must have screens that provide access to sampling the uppermost zone of the surficial aquifer and are within the range of the variability of the water table in the area to be monitored. For each shallow well, a 20-foot section of well screen must be installed across the water table as determined at the time of monitoring well installation. The bottom of the screen must be installed 15 feet below the water table; the top of the well screen must be positioned 5 feet above the water table at the time of monitoring well installation. The deep monitoring wells shall have 10 foot screens, the top of which must be set at 45 feet below the water table elevation as measured at the time of monitoring well installation.

(7) The wells shall be monitored on a quarterly basis in accordance with the EPA approved QAPP. Monitoring shall include all field parameters (temperature, pH, turbidity, depth to water, water elevation, etc.), and the analytes listed in Section III. A above. Monitoring shall continue for a period of eight (8) years (i.e., 32 rounds) from the date of the first sampling event unless the Parties agree to extend that time if no downward trend is apparent at the end of the eight (8) years as described in III.G. below.

(8) At any time after the initial round of sampling, at the EPA's unreviewable discretion, frequency and parameters for subsequent sampling events may be reduced.

(9) Pressure transducers with data loggers shall be installed in up to six wells within the boundary of the Dairy Facilities to measure fluctuations in the water table. Measurements from these instruments shall be collected once a week until the EPA determines that these measurements may cease.

(10) Within 5 days of completion of installation of monitoring wells, Respondents shall commence groundwater sampling.

(11) Respondents shall collect information sufficient to support submission of well construction and lithologic logs in the Groundwater Monitoring Well Installation Report.

(12) Description of well development methods and procedures. Respondents shall use the method in the *Monitoring Well Development Guidelines for Superfund Project Managers*, April 1992, unless Respondents propose and EPA approves an alternative method.

(13) Respondents shall complete a land survey, to be performed by a Washington State licensed professional land surveyor, of the well locations and elevations.

(14) Any non-EPA existing monitoring wells on or near the Dairy Facilities may be included in the monitoring well network, depending on their location and construction characteristics, if the EPA approves their use.

(15) Prior to termination of this Consent Order, if Respondents can demonstrate to the EPA that the nitrate level in a downgradient monitoring well has remained below the MCL for eight (8) consecutive quarters, upon notice from the EPA, Respondents may cease to sample that well. Prior to termination of this Consent Order, upgradient well sampling may cease as determined by the EPA.

2. Groundwater Monitoring Well Installation Report

The Groundwater Monitoring QAPP shall specify the outline, format and schedule for the Groundwater Monitoring Well Installation Report. The Groundwater Monitoring Well Installation Report shall include, at a minimum, the following information for all groundwater monitoring wells used to meet the project objectives described in Section II of this SOW, and shall be updated and resubmitted to include any wells installed pursuant to this Consent Order:

a. A description and map showing all well locations, including each well's surveyed surface reference point and vertical reference point elevation surveyed by a Washington State licensed surveyor. Wells shall be surveyed using, or existing well elevations converted to, the National Geodetic Vertical Datum (NGVD), 1929, or updated to North American Vertical Datum of 1988 (NAVD88) to an accuracy of within 0.01 feet. Horizontal surveying accuracy shall be within 1.0 foot and must include the Washington State Coordinate System of each location. The table which provides these data must reference the datum used for all measurements. Additional Regional guidance on constructing maps and formatting tabulated data will be provided by the EPA.

b. Respondents shall prepare a base map to identify the monitoring locations in reference to the potential source areas which are present. Base maps prepared from aerial photographs must reference: source of the photograph, date, north arrow, scale, altitude, name, photograph number or identification code, photo provider, camera calibration, etc. Image maps should be based on orthorectified or geo-registered imagery.

c. Site maps must show the locations of major features such as structures (buildings, tanks, lagoons, irrigated fields, fertilized fields, manure piles, unlined corrals, etc.), natural

features, monitoring wells, other sampling locations, major surface topography characteristics, spill areas, discharge points (pipes, culverts, weirs, etc.), scale, roads (including names), property and fence lines, etc. They must also include the base map reference, date of latest revision, project name and number, site location, north arrow, scale, and legend with the appropriate information depicted on the map.

d. The boring and casing diameter and depth of each well; description of well intake design, including screen slot type, size and length, depth of screen, filter pack materials, and method of filter pack emplacement.

e. As-built descriptions of the well casing and screen materials. Well construction materials shall be chosen based on parameters to be monitored, and the nature of contaminants that could potentially exist and migrate at or from the Dairy Facilities. Well materials shall: (1) minimize the potential of adsorption of constituents from the samples, and (2) not be a source of sample contamination. Wells shall be constructed for the purpose of long term monitoring in accordance with all applicable federal, state, and local laws.

f. Documentation of methods used to seal the well from the surface to prevent infiltration of water into the well and downward migration of contaminants through the well annulus.

g. Description of well development methods and procedures, including volume purged and parameter measurements.

h. Documentation that all boring, well installation, and well abandonment procedures comply with all applicable federal, state, and local laws, and were conducted by a well driller licensed in the State of Washington.

3. Groundwater Monitoring Data Reports

The Groundwater Monitoring QAPP shall also specify the outline and format for Quarterly and Annual Groundwater Monitoring Data Reports to present the findings of the groundwater monitoring Work. These specifications shall include, but are not limited to, the following:

a. Each Quarterly Groundwater Monitoring Data Report shall contain tabular displays that present the field parameters and validated data with qualifiers if applied, and complete analytical data package for constituents monitored in groundwater for monitoring events undertaken during that quarterly event. Each quarterly report shall include figure(s) that depict, at a minimum, water level elevations and gradient, and constituent concentrations. The second Quarterly Groundwater Monitoring Data Report shall include all of the information, interpretation, and cumulative data presentation and be formatted to be representative of an Annual Groundwater Monitoring Data Report. Each Quarterly Groundwater Monitoring Data Report shall be submitted to the EPA after each quarterly data collection effort as required in Section III.A. above.

b. Each Annual Groundwater Monitoring Data Report shall contain the same information contained in the Quarterly Groundwater Monitoring Data Reports, but must include a cumulative presentation of all data collected to date.

c. Each Annual Groundwater Monitoring Data Report must contain a chart for each sample parameter at each well. The charts will display time along the "x" axis and the measured amount along the "y" axis. The charts will include all historical data collected from each well that is depicted on Appendix A. Piper diagrams will also be included at intervals specified in the QAPP.

d. Each Annual Groundwater Monitoring Data Report shall be submitted as part of the Annual Report described in Section III.K.2. below.

F. Immediate Source Control Actions – Respondents shall conduct the following activities on the schedule indicated. Documentation of compliance, including photographs and diagrams, shall be provided in the Annual Report described in Section III.K.2. below.

1. **Application Fields**

a. Beginning on the Effective Date, Respondents shall apply animal waste and synthetic fertilizer in accordance with the current NRCS Practice Standard 590.

b. Within 60 days of the Effective Date, Respondents shall submit a Dairy Facility Application Field Management Plan that meets the requirements in Section III.A. above. The Dairy Facility Application Field Management Plan shall present the quality assurance project plan for representative sampling of the application fields and will be consistent with the following:

(1) Representative samples will be collected from a Sampling Unit (SU). A SU may correspond to a particular application field or, at the discretion of Respondent in consultation with a certified nutrient management planner, agronomist, or soil scientist, application fields may be subdivided into Management Units. Respondents shall submit the credentials of the certified nutrient management planner, agronomist, or soil scientist to the EPA in accordance with Section VII.13.a. of the Consent Order.

(2) If an application field is divided into Management Units, then the SUs will correspond to the particular Management Units contained by that application field.

(3) Representative samples will be collected from a SU using the following methodology:

(a) A single composite sample, produced from a defined number of subsamples, will be collected from the SU for each target depth to be sampled.

(b) A minimum of 20 subsamples will be collected from discrete locations within a SU of 25 acres or less. For SUs between 25 to 50 acres in size, 25 subsamples will be collected. For SUs greater than 50 acres in size, 30 subsamples will be collected.

(c) The subsample locations within the SU will be determined using a random method. The sampler will meander or zig-zag throughout the SU, making sure to distribute subsample sites throughout the SU.

(d) The target depth subsamples will be collected concurrently from the same subsample location.

(e) The subsamples will be of consistent volume and not less than 30 grams (approximately 1 ounce).

(4) This representative sampling procedure is consistent with generally-accepted professional agricultural practice and guidance for agricultural field sampling presented in Soil Sampling, University of Idaho College of Agriculture Cooperative Extension System Bulletin 704 (revised); Monitoring Soil Nutrients in Dryland Systems using Management Units, Oregon State University Extension Publication EM 8920-E; and Soil Sampling, USDA NRCS Fact Sheet MN-NUTR3 (revised July 2002).

(5) The composite soil samples shall be sent to a North American Proficiency Testing-accredited laboratory for the analysis specified in Section III.A above.

c. In accordance with the Dairy Facility Application Field Management Plan, Respondents shall take representative spring "pre-planting" and fall "post-harvest" soil samples at 12" and 24" depths below ground surface (bgs) from each sampling unit in accordance with practices as set forth in Respondent's Nutrient Management Plan using NRCS soil sampling guidance.

d. For each field where the "pre-planting" or "post-harvest" representative soil sample collected at the 24" depth bgs exceeds 45 ppm NO_3-N, Respondents shall employ a certified nutrient management planner, agronomist, or soil scientist to manage the field with the goal of achieving 45 ppm NO_3-N at the 24" depth. Respondents shall submit the credentials of the certified nutrient management planner, agronomist, or soil scientist to EPA in accordance with Section VII.13.a of the Consent Order.

e. In accordance with the Dairy Facility Application Field Management Plan, Respondents shall collect "post-harvest" representative soil samples at 36" depth bgs from each sampling unit. The purpose of these samples is to provide information regarding the soil nitrate concentrations below the crop root zone.

f. Within six months and twelve months of the Effective Date and within a month of the anniversaries of those dates for eight years, Respondents shall collect samples of manure liquids and solids twice each year from each Dairy Facility in accordance with the EPA-approved Dairy Facility Application Field Management Plan.

g. Respondents will consider planting crops with longer root zones. If crops with longer root zones are planted, Respondents shall submit an amendment to the Dairy Facility Application Field Management Plan that describes changes to required soil sampling to ensure samples will be collected from approximately one foot below the new, deeper root zone.

2. **Irrigation Water Management** – Working with the assistance of a professional irrigation consultant, Respondents shall prepare and submit an Irrigation Water Management Plan ("IWM Plan") that describes a system for irrigation water management. Respondents shall submit the credentials of the professional irrigation consultant to the EPA in accordance with Section VII.13.a. of the Consent Order. The IWM Plan shall describe flow metering to measure the volume of liquid applied to specific fields, and the installation of electronic sensors at the bottom of the root zone in each application field to provide for automatic shut off of the irrigation system to minimize water movement

below the root zone. Respondents shall submit the IWM Plan within 90 days of the Effective Date. Within 30 days of approval by the EPA, Respondents shall implement the IWM Plan.

3. **Silage Storage** - Within 60 days of the Effective Date, Respondents shall take actions to reduce nitrate contributions from silage storage at the Dairy Facilities. Actions shall include minimizing the ponding of leachate to reduce infiltration of leachate by directing leachate to storage ponds or lagoons.

4. **Solid Separator** – Within 60 days of the Effective Date, Respondents shall take actions to reduce nitrate contributions from solid separators operated at the Dairy Facilities. Actions shall include the following:

a. Locate on an impervious surface.
b. Berm and contain area receiving solids.
c. Direct leachate to storage pond or lagoon.

5. **Backflow Prevention System** – Within 30 days of the Effective Date, Respondents shall install and maintain backflow prevention devices to protect all wells at the Dairy Facilities.

6. **Lagoons** – Within 60 days of the Effective Date, Respondents shall submit to the EPA a Lagoon Review Report that provides documentation, i.e., plans and specifications signed by a WA licensed engineer, that shows that existing lagoons are constructed to current WA NRCS 313 standards, including a soil permeability rate not to exceed $1x10^{-6}$ ("NRCS 313 standard")[2]. For the purposes of this Consent Order, the term "lagoon" includes animal waste lagoons, and animal waste management or storage ponds. If any lagoons are not constructed to the current NRCS 313 standard, within 60 days of EPA approval of Lagoon Review Report, Respondents shall submit a plan for conducting an evaluation of each such lagoon at the Dairy Facilities. The purpose of this evaluation shall be to determine whether each such lagoon meets the current NRCS 313 standard ("Lagoon Evaluation Plan"). This evaluation shall include leak detection or water balance tests to determine that each such lagoon is not leaking beyond the current NRCS 313 standard. Within 60 days of the EPA's approval of the Lagoon Evaluation Plan, Respondents shall complete the evaluation of each such lagoon at the Dairy Facilities. The Lagoon Evaluation Plan shall include a schedule for submitting a Lagoon Evaluation Report and a Lagoon Work Plan, if needed. For each lagoon that does not meet the current NRCS 313 standard, the Lagoon Work Plan shall describe, at Respondents election, measures to address leakage or how Respondents will line those lagoons to meet the current standard at the rate of one lagoon per Dairy Facility per year.[3]

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[2] Washington NRCS Practice Standard 313 states: Soil permeability rate of the ponds wetted surface shall not exceed $1x10^{-6}$ cm/s. The effects of manure sealing will provide approximately one order of magnitude of additional protection resulting in a liner permeability of $1x\ 10^{-7}$ cm/s. If the foundation permeability rate exceeds $1x10^{-6}$ cm/s, a compacted clay, amended soil liner or synthetic liner is required. Refer to NRCS Conservation Practice Standard 521A-D.

[3] For purposes of this provision only, the Liberty Dairy, LLC and its associated Dairy Facility H&S Bosma shall be treated separately. That is, each Dairy Facility (Liberty Dairy LLC and H & S Bosma) may elect to line the lagoons to meet the current standard at the rate of one lagoon per Dairy Facility per year, subject to Section III.F.6.

7. **Manure Management** – Respondents shall manage solid animal waste stored or managed on site to minimize generation of leachate. Respondents shall also endeavor to avoid transporting manure to locations where groundwater is known by Respondents to currently exceed 10 mg/L nitrate. Applications of manure on crop fields in such areas is allowed only if "post-harvest" soil sample is 45 ppm NO_3-N or lower at the 2 foot depth. Respondents shall maintain records of locations to which manure is transported off of the Dairy Facilities. Respondents shall submit those records in the Annual Report submitted to EPA.

8. **Furrow Irrigation** – Respondents shall eliminate all furrow irrigation at the Dairy Facilities within two years of the Effective Date.

9. **Dry wells** – Respondents shall decommission all dry wells at the Dairy Facilities in accordance with Washington Department of Ecology regulations (WAC 173-160-381 Standards for Decommissioning Wells).

10. **Cow Pens** – Respondents shall minimize the ponding of liquid in the cow pen areas to reduce infiltration of nitrogen-rich water.

11. **Roof Runoff** – Respondents shall confirm that all roof runoff is not allowed to pond on the ground and infiltrate; roof runoff must either be kept separated from contaminated areas or directed to lagoons.

12. **Respondent Liberty Dairy, LLC only** – As the nearest Dairy Facility and without admission of fault or causation, Respondent Liberty Dairy, LLC agrees to conduct an assessment of the area surrounding monitoring well DC-03 (190 mg/L nitrate level obtained in January 2013). Respondent Liberty Dairy, LLC shall retain an Environmental Professional to perform a review of present conditions of the property surrounding DC-03 and evaluate any likely causes for the well contamination. Within 60 days of the Effective Date, Respondent Liberty Dairy, LLC shall prepare and submit to EPA for approval a plan for this evaluation and a schedule for a follow-up report.

G. Additional Source Control Actions

The Annual Report that is submitted after collection of the 32 rounds of monitoring well samples (after eight years and so the "Year Eight Report"), shall include a complete set of the eight years of data collected from the monitoring wells and a chart showing nitrate concentrations in each well over time. After the EPA's notification based on the information presented in the Year Eight Report, Respondents shall follow the steps set forth below:

1. After eight years of monitoring (or longer period as agreed by the Parties), for those monitoring wells downgradient of the Dairy Facilities, where nitrate levels were at any time above the MCL, if nitrate levels show a downward trend considering upgradient well data; and where nitrate levels were below the MCL, the trend is not increasing; then, no further work is required. Upon notice by the EPA, the Consent Order will be terminated.

2. If, after eight years of monitoring (or longer period as agreed by the Parties), there is no downward trend in one or more downgradient wells that exceed the nitrate MCL,

considering the upgradient well data, or the wells that were below the nitrate MCL show increasing nitrate levels, then Respondents shall take either of the following actions at each Respondent's discretion:

a. Within 45 days of EPA approval of the Year Eight Report, Respondents shall submit to the EPA a Source Investigation QAPP that identifies each downgradient monitoring well where nitrate levels exceeded the MCL at any time and did not trend downward. For each of these wells, the Source Investigation QAPP shall identify all of the potential sources that are upgradient of these monitoring wells. The sources shall also be categorized by the type of source (e.g. lagoons of similar construction, application fields on the same soil type where the same crop is grown and irrigation and fertilizer rates are similar, etc.). The Source Investigation QAPP shall identify a representative source for each type of source. The Source Investigation QAPP shall describe further monitoring at each such representative source. This further monitoring shall include at least one upgradient and two to three downgradient wells (which could include existing wells) at each type of source that is representative (e.g., lagoons of similar construction, fields where similar crops have been grown, etc.). The monitoring well installation, sampling, and reporting described in the Source Investigation QAPP shall comply with the requirements set forth in Section E. (Groundwater Monitoring) of this SOW. The Source Investigation QAPP shall include a schedule for implementation, describe the Source Investigation Report, as well as provide for submission and implementation of subsequent mitigation plans (Supplemental Source Control Plans) to be submitted based on the results of the source investigation. Any Supplemental Source Control Plan required based on the source investigation shall pertain to each source within the Dairy Facilities that is similar to the representative source investigated.

OR

b. Within 45 days of EPA approval of the Year Eight Report, Respondents shall submit to the EPA a Supplemental Source Control Plan that shall include a schedule for implementation of source control actions and provide for a Supplemental Source Control Actions Report. Respondents shall implement control actions at each source upgradient from those monitoring wells that exceed the nitrate MCL and where a downward trend considering upgradient well data was not achieved and at every similar type of source throughout the Dairy Facilities, in accordance with the EPA approved Supplemental Source Control Plan and the following:

(1) **Silage** – Ensure that the bottom of each silage storage area is impermeable and leachate is routed to a lagoon or waste storage pond.

(2) **Lagoons** –

(a) Line lagoons to the current NRCS 313 standard at the time of lining, but not less than 1×10^{-6} cm/sec, at the rate of two per year per Dairy Facility;

(b) Use enhanced solids separator to minimize lagoon usage; or

(c) Sufficiently reduce herd size to eliminate the need for a particular lagoon; or

(d) Take a lagoon out of service. For any lagoon once used by a Respondent that is no longer in use, Respondents shall submit a closure plan to EPA to ensure that each such inactive lagoon is not contributing nitrate.

(3) **Cow Pens** – Improve management of manure in cow pens. Minimize the ponding of liquid (e.g., direct ponding liquid to lagoons).

(4) **Application Fields** – Consider any additional measures to further reduce amount of NO_3-N migrating past the root zone, such as crop changes, reduction of amount of manure applied, application splits (applying fertilizer three times in smaller amounts to fields instead of two larger applications), additives/treatments to further denitrify lagoon water, nitrogen stabilizers for the fields, and other measures designed to help reduce the amount of NO_3-N getting past the root zone.

(5) Submit plan to investigate surface water retention basins (e.g., tail water ponds) for possible contribution of nitrate. Submit and implement mitigation plan, if determined to be a source.

H. Alternative Termination

Upon completion of supplemental source control actions, EPA approval of the Supplemental Source Control Actions Report, and notice by EPA, this Consent Order will be terminated.

I. Three Year Review

At Respondents' election, Respondents and the EPA may elect to conduct a review approximately three years after the Effective Date – regardless of the monitoring results. The purpose of this review will be to discuss whether the Consent Order should be amended at Respondents' request based on new developments or technologies, such as:

1. Digester developments;
2. GWMA actions;
3. State/federal legislative actions; or
4. USGS report on groundwater in the Yakima Valley.

J. Continuation of Source Control Actions

After this Consent Order terminates, each Respondent shall continue source control actions that are undertaken pursuant to this Consent Order as long as Respondent continues to operate a Dairy Facility at the location depicted on Appendix A.

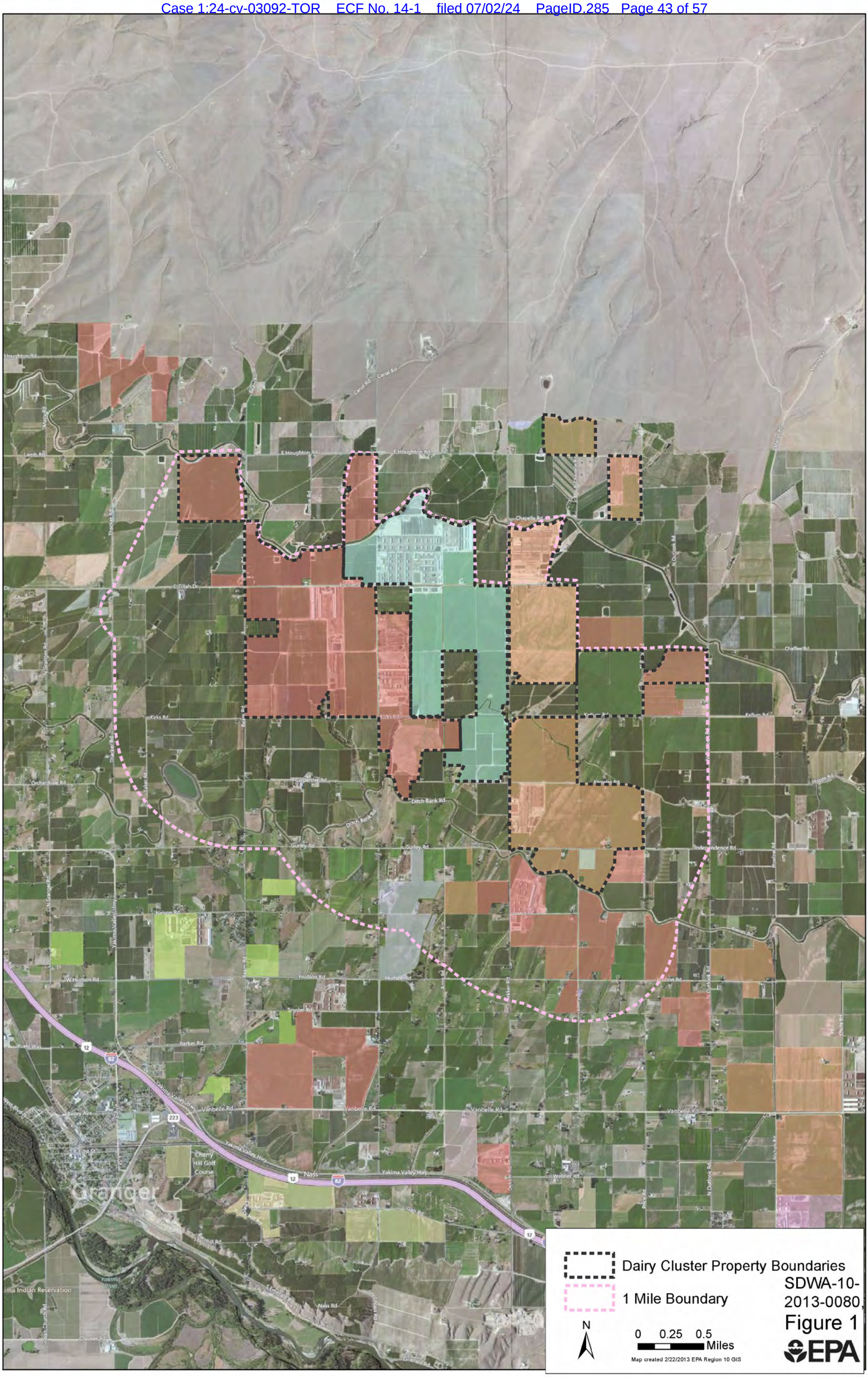
K. Reporting

1. Monthly Progress Reports

Monthly progress reports shall include, at a minimum and in this order: (1) identify major accomplishments and issues that arose during the previous month; (2) briefly describe all other actions which have been taken to comply with this Consent Order during the prior month; (3) describe all work planned for the next sixty (60) days with schedules relating to such work to the overall project schedule for completion of the Work; and (4) describe all problems encountered and any anticipated problems and actual or anticipated delays, and solutions developed and implemented to address any actual or anticipated problems or delays.

2. Annual Reports

No later than March 1 of each year after the Effective Date, beginning in 2014, Respondents shall provide to the EPA an Annual Report which shall describe all activities undertaken pursuant to this Consent Order over the prior year. All data shall be presented with cumulative results reflecting prior years and shall be summarized and presented in tabulated form. Data shall be organized by Dairy Facility and type of data. For example, soil data shall be organized by Dairy Facility and application field at that Dairy Facility, etc. The Annual Report shall include, at a minimum, a table and a chart for each application field that displays the measured nitrogen soil levels for the current year and all previous years for which data is available, so that a trend, if any, may be observed at each sampling depth. The Annual Report shall include the Groundwater Monitoring Data Report for each year which shall contain the complete set of data collected from the monitoring wells to date and a chart showing nitrate concentrations in each well over time. Respondents may cease submitting these Annual Reports to the EPA upon termination of the Consent Order.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Yakima Valley Hwy
Cherry Hill Golf Course
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Independence Rd
Orchardvale Rd
Thacker Rd
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Dairy Cluster Property Boundaries
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SDWA-10-2013-0080,
Figure 1
EPA

ATTACHMENT 1
SCHEDULE OF TASKS
STATEMENT OF WORK
ADMINISTRATIVE ORDER ON CONSENT
EPA DOCKET NO. SDWA-10-2013-0080

TABLE 1: SCHEDULE OF TASKS		
Task Number	**Task Title**	**Time to Complete**
	GENERAL TASKS	
1	Identify Project Coordinator (Consent Order 16. b.) and Contractor (notification of subsequent contractors must be provided to EPA 20 days prior to commencement of Work) (Consent Order 16.a.)	Within 10 days after Effective Date
2	Submit a QAPP for EPA review and approval (III.A.)	Prior to commencing monitoring, sampling, field measurements, laboratory analysis.
3	Submit Health and Safety Plan (III.B.)	At least 14 days prior to initial field work for any task.
4	Notify EPA regarding interest in participating in the public involvement process (III.C.)	Within 30 days of the Effective Date
	PROVISION OF WATER (III.D.)	
5	Submit Residential Well Sampling QAPP (III.D.2.)	Within 21 days of the Effective Date
6	Test each residential drinking water well within the Dairy Facilities boundary and within one mile downgradient of the Dairy Facilities (III.D.3.)	Within 60 days of EPA approval of the Residential Well Sampling QAPP
7	Provide residents results of Hach test strip (III.D.4.)	At the time of testing
8	Provide preliminary results of laboratory analysis of residential drinking water well samples to EPA (III.D.4.)	Within 14 days of sample collection
9	Provide validated laboratory analytical results to each resident and to EPA (III.D.4.)	Within 21 days of sample collection
10	Provide reverse osmosis treatment system (or other EPA approved alternative water supply) to each owner/occupant that accepts offer for alternative water (III.D.5)	Within 30 days of submitting validated laboratory analytical results to EPA
11	Submit Residential Well Sampling Report	Within 150 days of EPA approval of Residential Well Sampling QAPP
	GROUNDWATER MONITORING (III.E.)	
12	Submit Groundwater Monitoring QAPP (III.E.1.)	Within 60 days of the Effective Date

13	Submit Groundwater Monitoring Well Installation Report (III.E.2.)	In accordance with the schedule in the EPA-approved Groundwater Monitoring QAPP, but not later than 60 days after monitoring well installation
14	Report validated groundwater nitrate analytical results (III.A.3.e.(1))	Within 30 days of collecting last sample of each sampling event
15	Quarterly Groundwater Monitoring Data Reports (III.E.3.)	Within 60 days of each quarterly monitoring event for at least the first year, with later adjustment allowed by EPA.
16	Annual Groundwater Monitoring Data Report (III.E.3.)	No later than March 1 of each year after the Effective Date beginning in 2014 (as part of the Annual Report described in III.K.2.)
	IMMEDIATE SOURCE CONTROL ACTIONS (III.F.)	
17	Submit Dairy Facility Application Field Management Plan (III.F.1.)	Within 60 days of the Effective Date
18	Submit Dairy Facility Application Field Reports (III.A.3.e.(2))	Within 60 days of collecting last sample of each sampling event
19	Submit Irrigation Water Management Plan (III.F.2.)	Within 90 days of the Effective Date
20	Implement Irrigation Water Management Plan (III.F.2.)	Within 30 days of approval by EPA
21	Take action to reduce nitrate contributions from silage storage (III.F.3.)	Within 60 days of the Effective Date
22	Take action to reduce nitrate contributions from solid separator (III.F.4)	Within 60 days of the Effective Date
23	Install backflow prevention system (III.F.5)	Within 30 days of the Effective Date
24	Submit Lagoon Review Report (III.F.6.)	Within 60 days of the Effective Date
25	Submit Lagoon Evaluation Plan (III.F.6).	Within 60 days of EPA's approval of the Lagoon Review Report
26	Submit Lagoon Evaluation Report and Lagoon Work Plan (III.F.6)	In accordance with the schedule in the EPA-approved Lagoon Evaluation Plan
27	Submit records of locations to which manure is transported off of the Dairy Facilities (III.F.7)	In the Annual Report
28	Eliminate furrow irrigation (III.F.8.)	Within two years of the Effective Date
29	Submit Plan for assessment of area surrounding monitoring well DC-03 (III.F.12.)	Within 60 days of the Effective Date

	ADDITIONAL SOURCE CONTROL ACTIONS (III.G.)	
30	Submit Year Eight Report (III.G.)	After eight years (32 rounds) of monitoring well sample collection
31	Submit Source Investigation QAPP (III.G.2.a.)	If triggered, within 45 days of EPA approval of the Year Eight Report
32	Submit Source Investigation Report and Supplemental Source Control Plan(s) (III.G.2.a.)	In accordance with the schedule in the EPA-approved Source Investigation QAPP
33	Supplemental Source Control Plan (III.G.2.b.)	Within 45 days of EPA approval of the Year Eight Report
	REPORTING (III.K.)	
34	Monthly Progress Reports (III.K.1.)	No later than the 15th day of each month after the Effective Date beginning in April 2013
35	Annual Reports (III.K.2.)	No later than March 1 of each year after the Effective Date beginning in 2014

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10

In the Matter of: Yakima Valley Dairies Cow Palace, LLC; D&A Dairy, LLC (also known as D and A Dairy L.L.C.), George DeRuyter & Son Dairy, L.L.C., and George & Margaret, L.L.C.; Liberty Dairy, LLC, and its associated Dairy Facility H&S Bosma Dairy Respondents	)	FIRST AMENDMENT TO ADMINISTRATIVE ORDER ON CONSENT Proceeding under Section 1431(a) of the Safe Drinking Water Act, 42 U.S.C. § 300i(a) Docket No. SDWA-10-2013-0080

1. This First Amendment modifies the Administrative Order on Consent ("Consent Order") entered into by the United States Environmental Protection Agency ("EPA") and the Respondents to the Consent Order, pursuant to Section XV of the Consent Order (Modifications).

2. The Respondents have agreed to perform all requirements of the Consent Order and its Appendix B Statement of Work ("SOW"), such as sampling, monitoring, and several immediate source controls, within the boundaries of their dairy facilities.

3. Paragraph 9 of Section IV of the Consent Order defines a "dairy facility" subject to the Consent Order as "the facility or facilities owned or operated by Respondents and depicted on Appendix A."

4. The maps constituting Appendix A of the Consent Order include approximately 96.48 acres of real property unrelated to any dairy facility that was inadvertently included within the boundaries of the Liberty Dairy and its associated dairy facility H&S Bosma Dairy ("Liberty Dairy").

5. The 96.48 acres of unrelated real property consists of three tax parcels assigned the following parcel numbers by the Yakima County Department of Assessment: #21112614004, #21112611009, and #21112611008 (collectively, the "Non-Dairy Property").

USEPA REG
0002036

6. The Non-Dairy Property is depicted in red on Attachment A hereto.

7. The parties have agreed to correct this mistake and remove the Non-Dairy Property from the scope of the Consent Order and the SOW.

8. In accordance with Paragraph 45 of Section XV of the Consent Order, the Consent Order may be modified in writing by mutual agreement of the parties by this First Amendment.

9. Appendix A of the Consent Order is hereby modified by removing the two maps currently constituting Appendix A of the Consent Order and replacing them with the maps attached hereto as Attachment B.

10. This First Amendment to the Consent Order shall be effective on the day that it is signed by the Director of the Office of Compliance and Enforcement in Region 10, of EPA, who shall be the last signatory to this First Amendment.

11. In all other respects the Consent Order remains unchanged.

It is so AGREED:

For Liberty Dairy, LLC and its associated Dairy Facility H&S Bosma Dairy:

By: _____ 11-14-13
Signature Date

Henry W Bosma
Print Name

member
Print Title or Affiliation

For Cow Palace, LLC:

By: [signature] 11-12-13
Signature Date

Adam Dolson
Print Name

Owner
Print Title or Affiliation

For D & A Dairy, LLC (also known as D and A Dairy, L.L.C.), and George DeRuyter & Son Dairy, L.L.C.:

By: Dan DeRuyter 11/15/13
Signature Date

Dan DeRuyter
Print Name

Member
Print Title or Affiliation

For George & Margaret, L.L.C.:

By: Dan DeRuyter 11/15/13
Signature Date

Dan DeRuyter
Print Name

member
Print Title or Affiliation

It is so ORDERED and Agreed:

For the U.S. Environmental Protection Agency

BY: _____ DATE: 10/25/2013

Edward J. Kowalski, Director
Office of Compliance and Enforcement
U.S. Environmental Protection Agency, Region 10

ATTACHMENT A

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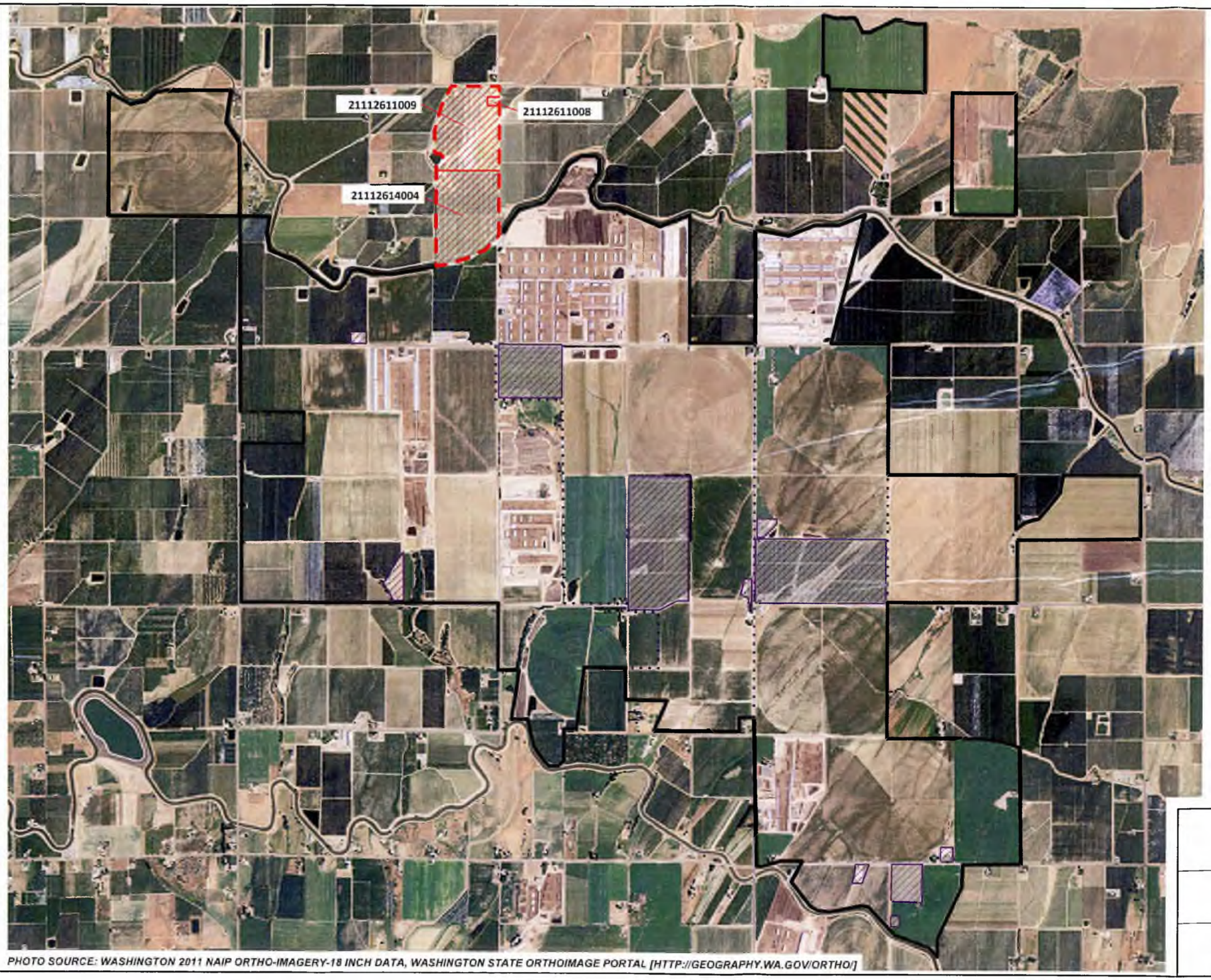

LEGEND

- APPROXIMATE BOUNDARY OF DAIRY FACILITIES
- LAND WITHIN BOUNDARY NOT OWNED OR OPERATED BY RESPONDENTS
- RESPONDENTS OWNERSHIP BOUNDARIES
- PARCEL(S) CURRENTLY WITHIN THE DAIRY FACILITY BOUNDARY TO BE RELEASED FROM THE AOC

APPROXIMATE SCALE

0 2,000

FEET

PHOTO SOURCE: WASHINGTON 2011 NAIP ORTHO-IMAGERY-18 INCH DATA, WASHINGTON STATE ORTHOIMAGE PORTAL [HTTP://GEOGRAPHY.WA.GOV/ORTHO/]

REQUEST FOR MODIFICATION – EXHIBIT A

SDWA-10-2013-0080

ATTACHMENT A

REVISED FACILITY BOUNDARY

ATTACHMENT B

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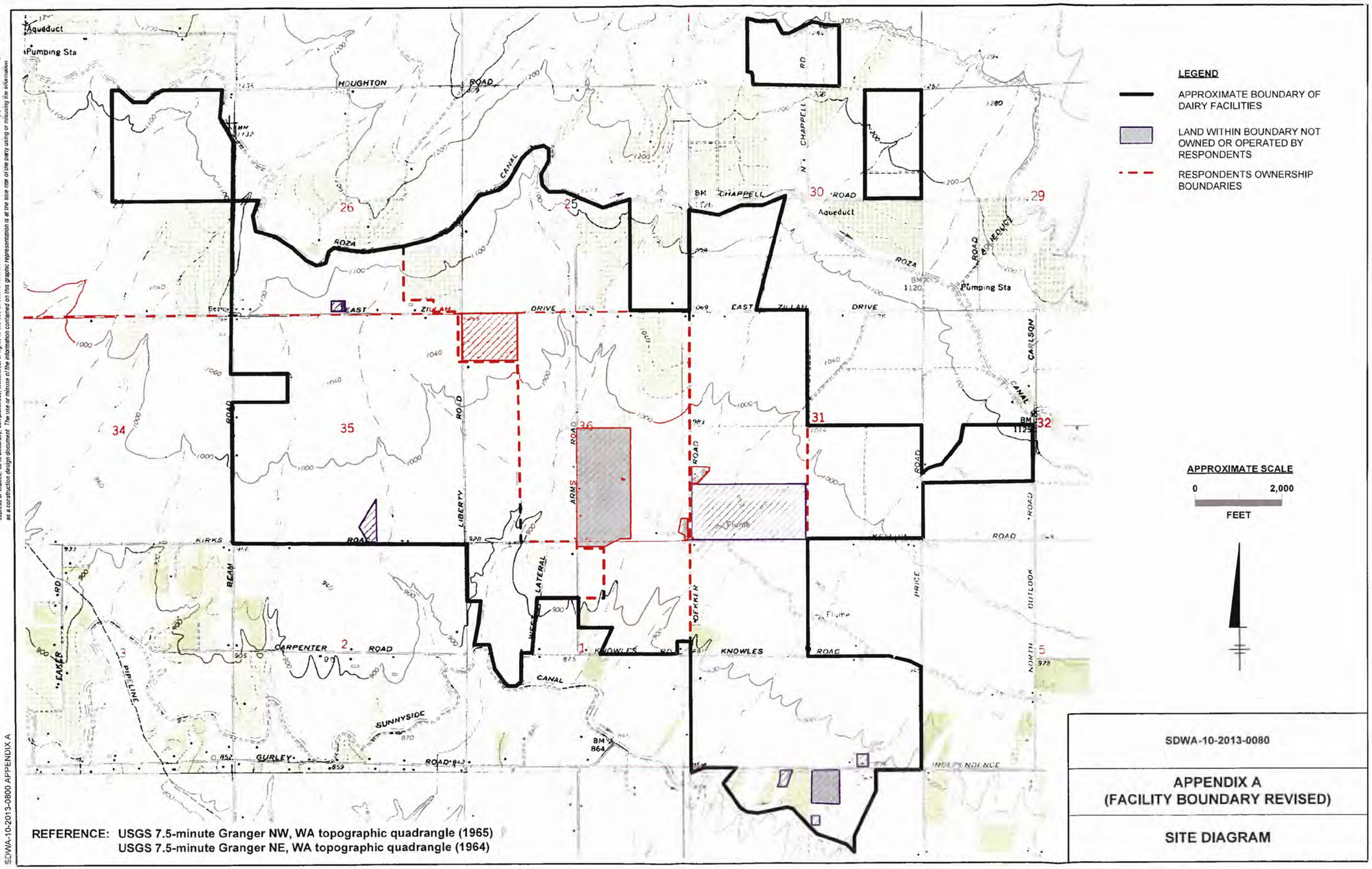

REFERENCE: USGS 7.5-minute Granger NW, WA topographic quadrangle (1965)
USGS 7.5-minute Granger NE, WA topographic quadrangle (1964)

SDWA-10-2013-0080

APPENDIX A
(FACILITY BOUNDARY REVISED)

SITE DIAGRAM

SDWA-10-2013-0800 APPENDIX A

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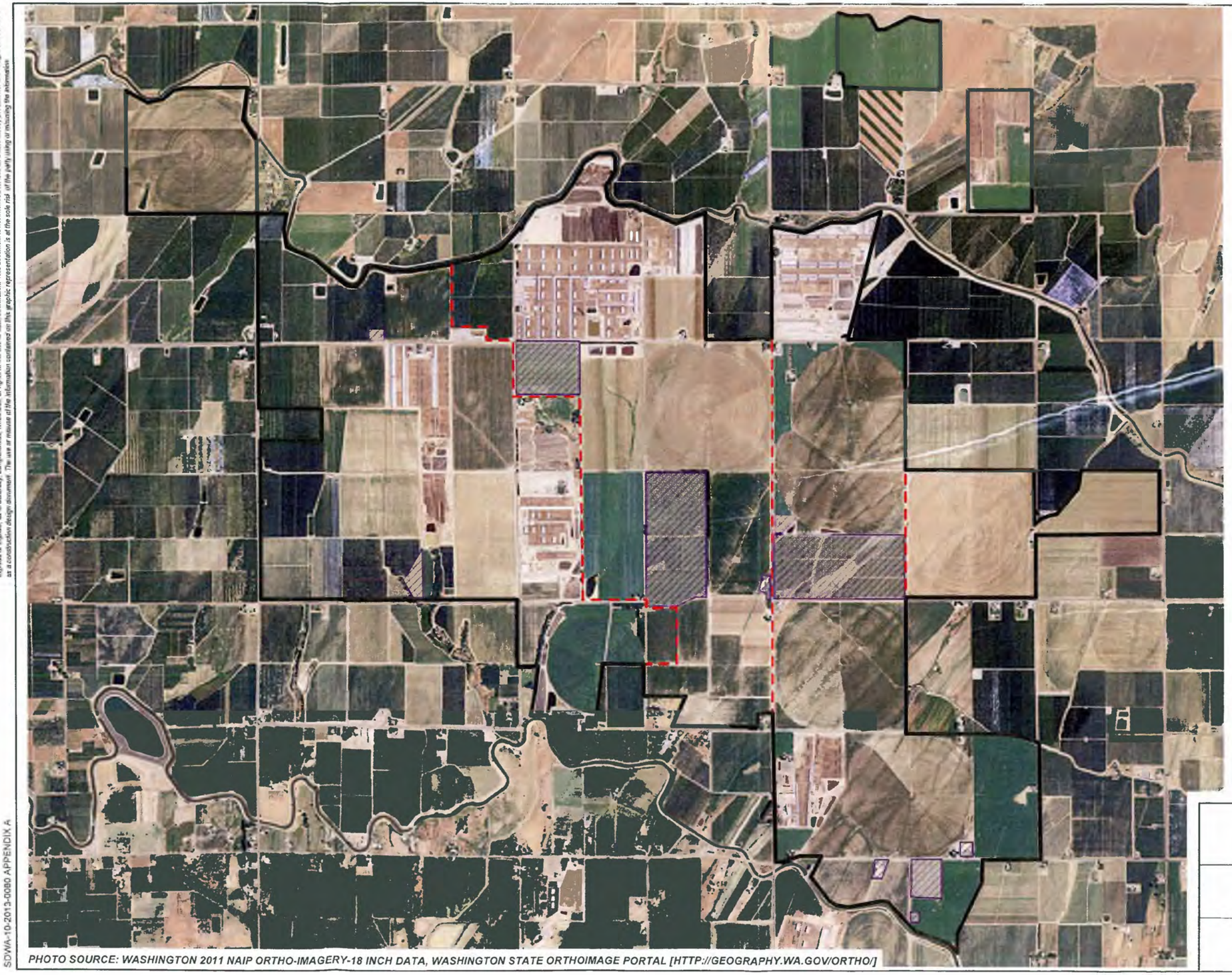

LEGEND

APPROXIMATE BOUNDARY OF DAIRY FACILITIES

LAND WITHIN BOUNDARY NOT OWNED OR OPERATED BY RESPONDENTS

RESPONDENTS OWNERSHIP BOUNDARIES

APPROXIMATE SCALE

0 2,000

FEET

PHOTO SOURCE: WASHINGTON 2011 NAIP ORTHO-IMAGERY-18 INCH DATA, WASHINGTON STATE ORTHOIMAGE PORTAL [HTTP://GEOGRAPHY.WA.GOV/ORTHO/]

SDWA-10-2013-0080

APPENDIX A
(REVISED FACILITY BOUNDARY)

AERIAL PHOTOGRAPH

SDWA-10-2013-0080 APPENDIX A

Eric Winiecki Declaration
Exhibit B

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, WA 98101

March 18, 2013

Reply to
Attn Of: OWW-136

To: The File

From: Eric Winiecki
EPA Region 10 Drinking Water Program

Re: Underground Sources of Drinking Water (USDW) in the Yakima Valley

The shallow alluvial aquifer and the deeper basaltic aquifers in the Yakima Basin are Underground Sources of Drinking Water (USDW). More specifically, the alluvial and basaltic aquifers in the vicinity of the Henry Bosma Dairy, Liberty Dairy, Cow Palace #1 and #2, George DeRuyter Dairy, and R&M Haak Diary are USDWs.

EPA's review of publicly available well logs (including dairy well logs and private residential well logs) in the vicinity of these dairy facilities shows that the alluvial and basaltic aquifers currently supply drinking water for human consumption, and that both aquifers can provide water in sufficient quantity for a public water system.

The water in the alluvial aquifer and the basaltic aquifer contains less than 10,000 milligrams per liter of total dissolved solids (TDS). The World Health Organization considers 1,000 milligrams per liter TDS to be the upper limit of human palatability,[1] and there are numerous drinking water wells in the area that are screened at various depths. EPA is unaware of any widespread claims that the groundwater in these areas is, or has ever been, unpalatable.

Based on personal communications with Washington Department of Ecology's Underground Injection Control Program and their Toxic Cleanup Program on August 6, 2012, there are no exempted aquifers in the Yakima Valley. Staff indicated the alluvial and basaltic aquifers in the vicinity of the dairy facilities would likely not be eligible for exemption because they are currently used as a source of drinking water.

---

1 Total Dissolved Solids in Drinking-water, Background document for development of WHO Guidelines for Drinking Water Quality, originally published in Guidelines for Drinking-water quality, 2nd ed. Vol. 2, World Health Organization, Geneva, 1996.

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There are public water systems located in a generally downgradient direction of the diaries listed above. The City of Sunnyside water wells are located downgradient of the Haak Dairy. There are many public water systems located generally downgradient of the Dairy Cluster including the public water system serving the City of Granger. The Granger Water Department (ID Number 29000) is a Group A Community Water System with 3 active sources, 728 connections, serving a population of 2,990. Well depths of their sources are 252 feet (capacity 350 gpm), 106 feet (capacity 280 gpm), and 554 feet (capacity 425 gpm). The 106 foot deep well is likely screened in the shallow alluvial aquifer and contains a sufficient quantity of ground water to supply a public water system.

The groundwater in the alluvial and basaltic aquifers that underlie the dairy facilities discharges to the Yakima River or its tributaries. Downriver public water systems utilizing the Yakima River or the receiving Columbia River as a source of drinking water would pull in water that came in part from these aquifers. Tributaries located near and on the dairy facilities, and parts of the Yakima River, have been identified by the State of Washington as "source water protection areas" for specific water systems that utilize surface water as their source of drinking water.

Eric Winiecki Declaration
Exhibit C

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Provision of Water

Residential Well Sampling Report

Administrative Order on Consent
SDWA-10-2013-0080

March 6, 2014

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Residential Well Sampling

Provision of Water

Administrative Order on Consent SDWA-10-2013-0080

Yakima Valley Dairies, Washington

Report Approvals:

March 6, 2014
Kevin M. Freeman, PG — Date
Project Coordinator

March 6, 2014
Amy Goldberg-Day — Date
Project Chemist

March 6, 2014
Steve Hicks, PE — Date
Quality Manager

ARCADIS

Residential Well Sampling Report

Provision of Water
Administrative Order on Consent
SDWA-10-2013-0080

Prepared for:
Yakima Valley Dairies

Prepared by:
ARCADIS U.S., Inc.
695 North Legacy Ridge Drive
Suite 200
Liberty Lake
Washington 99019
Tel 509 928 3369
Fax 509 928 3075

Our Ref.:
SK030326.0001
SK030334.0001
SK030335.0001

Date:
March 6, 2014

ARCADIS

Table of Contents

1. Introduction **1**

1.1 Purpose 1

1.2 Scope of Work 2

2. Data Generation and Acquisition **3**

2.1 Residence Identification and Communication 3

2.2 Residential Well Sampling 4

2.2.1 Sampling Methods 5

2.2.2 Sample Handling and Custody 7

2.3 Analytical Methods 8

2.4 Quality Control 9

2.4.1 Field Quality Control Samples 9

2.4.2 Laboratory Quality Control Procedures 9

2.5 Data Management 10

3. Assessment **10**

3.1 Residential Sampling Locations 11

3.2 Field Screening 11

3.3 Analytical Results 11

3.3.1 Result Less Than MCL 11

3.3.2 Result Greater Than MCL 12

3.4 Treatment System Installations and Maintenance 12

3.4.1 Reverse Osmosis System Installations 12

3.4.2 Existing RO System Maintenance 12

3.4.3 Not-At-Home and Refusal Residences 12

4. Data Validation and Usability **13**

4.1 Data Review, Verification, and Validation 13

4.2 Verification and Validation Methods 13

4.2.1 Validation 13

4.3 Reconciliation with User Requirements 15

5. References Cited 16

6. Certifications 17

6.1 Cow Palace Certification 17

6.2 D & A Dairy and George DeRuyter & Son Dairy Certification 18

6.3 George & Margaret Certification 19

6.4 Liberty Dairy Certification 20

Tables

Table 1 Summary of Residences

Table 2 Existing Reverse Osmosis Systems

Table 3 Hach™ Test Results Less Than 5 PPM

Table 4 Drinking Water Sampling Results

Table 5 Analytical Quality Control Samples

Table 6 Drinking Water Sampling Results Less Than MCL

Table 7 Drinking Water Sampling Results Greater Than MCL

Table 8 Reverse Osmosis System Installation

Table 9 Existing Reverse Osmosis System Maintenance

Table 10 Not-At-Home and Refusal Residences

Figures

Figure 1 Site Map

Figure 2 Aerial Photograph

Figure 3 Nitrate Analytical Results

Appendices

A	Model Letters Used to Communicate with Residences
B	Residential Well Sampling Records
C	Analytical Laboratory Reports
D	Data Usability Summary Reports (Without Analytical Laboratory Reports)
E	Reverse Osmosis Treatment System Work Orders
F	WQX Data Files (Attached CD-ROM)

Acronyms and Abbreviations

AOC	Administrative Order on Consent
DQO	data quality objective
EPA	U.S. Environmental Protection Agency
HSP	Health and Safety Plan
MCL	maximum contaminant level
mg/L	milligrams per liter
PARCC	precision, accuracy, representativeness, comparability, and completeness
PC	Project Coordinator
QAM	Quality Assurance Manager
QAPP	Quality Assurance Project Plan
QC	quality control
RO	reverse osmosis
SOP	standard operating procedure
SOW	Statement of Work
SSC/STL	Site Safety Coordinator/Sampling Team Leader

Distribution List

Adam Dolson	Cow Palace
Dan DeRuyter	George DeRuyter & Son Dairy
Henry Bosma	Liberty Dairy
Eric Winiecki	EPA
Gina Greppo-Grove	EPA
Rene Fuentes	EPA
Jennifer MacDonald	EPA
Kevin Freeman	ARCADIS
Steve Hicks	ARCADIS
Amy Goldberg Day	ARCADIS
Patrick W. Ryan	Perkins Coie LLP
Lori Terry Gregory	Foster Pepper PLLC

Executive Summary

Pursuant to Section III.D - Provision of Water as presented in the Statement of Work (SOW) of the Yakima Valley Dairies (the "Dairies") Administrative Order on Consent (AOC) SDWA-10-2013-0080, the Dairies are required to offer reverse osmosis (RO) treatment systems, or other alternative water if mutually approved by the U.S. Environmental Protection Agency (EPA) and the Dairies, to each residence that does not already have a RO treatment system or alternative water where testing showed that nitrate concentrations in the drinking water supply exceed the nitrate maximum contaminant level (MCL) of 10 milligrams per liter (mg/L), provided that the residence is within the "area of interest" as defined by the AOC.

Collection and analysis of drinking water samples were required in order to determine the need for RO treatment systems or alternative water supply at residences within the area of interest. For residences where RO systems are in place, no sampling of the water supply was conducted. The Dairies offered to provide professional maintenance of these pre-existing systems at the Dairies cost.

The scope of the Residential Well Sampling included the collection and analysis of drinking water samples from residences within the area of interest according to methods presented in the Residential Well Sampling Quality Assurance Project Plan (QAPP) dated April 26, 2013 (approved by EPA May 13, 2013). Residential well sampling was initiated on May 27, 2013 and substantially completed by June 20, 2013; ARCADIS continued to sample residences who responded to the notification letter and/or "not-at-home" notification until June 20, 2013.

The results of the sampling effort and subsequent RO treatment system installation and maintenance offers are summarized on a per-residence basis as follows:

Element	Number of Residences	Information Reference
Residences identified as being located within the area of interest	224	Table 1
Residence already had reverse osmosis unit installed	50	Table 2
Residence assessed for nitrate concentration in drinking water, either by Hach test strip or lab analysis	141	Tables 3 and 4

Element	Number of Residences	Information Reference
Hach test strip indicated a drinking water nitrate concentration under 5 ppm at the residence	26	Table 3
Residence drinking water was sampled and sent to analytical laboratory for nitrate analysis	115	Tables 6 and 7
Residence drinking water sample nitrate concentration was less than the nitrate MCL, either by Hach test strip or lab analysis	75	Tables 3 and 6
Residence drinking water sample nitrate concentration exceeded the nitrate MCL based on laboratory analysis	67	Table 7
Residence drinking water sample nitrate concentration was below the nitrate MCL based on laboratory analysis	49	Table 6
Residence drinking water was not sampled because the resident refused access	4	Table 10
Residence drinking water was not sampled because there was no resident at home and follow-up contact requests failed	19	Table 10
Residence drinking water was not sampled because the residence was vacant	8	Table 10
Residence was offered reverse osmosis treatment system, at no charge to the resident	63	Table 8
Residence accepted the offer of a reverse osmosis unit	36	Table 8
Residence was offered maintenance of existing reverse osmosis unit, at no charge to the resident	50	Table 9
Residence accepted the offer of maintenance of an existing reverse osmosis unit	15	Table 9

Out of 191 residences that were assessed for nitrate (either by Hach test strip, laboratory analysis, or the presence of an existing reverse osmosis unit) approximately 61 percent exceeded the maximum contaminant level (MCL) of 10 mg/L for nitrate or already had a nitrate treatment system installed

At the time of this report (March 6, 2014), the Dairies have responded to all received requests from residents for either (1) installation and maintenance of new RO systems

or (2) maintenance of existing RO systems. Based on this information, the Dairies have met and completed the Provision of Water requirement of the AOC.

1. Introduction

ARCADIS U.S. Inc. (ARCADIS) on behalf of: (1) Cow Palace, LLC; (2) D & A Dairy, LLC (also known as D&A Dairy L.L.C.), George DeRuyter & Son Dairy, L.L.C., and George & Margaret, L.L.C; and (3) Liberty Dairy LLC and its associated dairy facility H&S Bosma Dairy presents the U.S. Environmental Protection Agency (EPA) this Residential Well Sampling Report (the "Report") for the Yakima Valley Dairies (the "Dairies"). The Report was prepared in accordance with the requirements identified in Section III - Provision of Water of the Statement of Work (SOW) for Administrative Order on Consent (AOC) SDWA-10-2013-0080. Residential Well Sampling Activities are defined in the Residential Well Sampling Quality Assurance Project Plan (QAPP) dated April 26, 2013 (approved by EPA May 13, 2013).

1.1 Purpose

Pursuant to Section III.D - Provision of Water as presented in the AOC SOW, the Dairies are required to offer reverse osmosis (RO) treatment systems, or other alternative water if mutually approved by the EPA and the Dairies, to each residence that does not already have a RO treatment system or alternative water where testing showed that nitrate concentrations in the drinking water supply exceed the nitrate maximum contaminant level (MCL) of 10 milligrams per liter (mg/L), provided that the residence is within:

- The boundary of the Dairy Facilities (Figures 1 and 2), or
- One mile downgradient of the boundary of the Dairy Facilities (Figure 1 and Figure 2).

Collection and analysis of drinking water samples were required in order to determine the need for RO treatment systems or alternative water supply at residences within the boundaries identified in Figures 1 and 2, hereafter referred to as the "area of interest".

For residences where RO systems are in place, no sampling of the water supply was conducted. The Dairies offered to provide professional maintenance of these systems at the Dairies cost.

1.2 Scope of Work

The scope of the Residential Well Sampling included the collection and analysis of drinking water samples from residences within the area of interest as presented in Section 1.1.

Activities performed as part of the Residential Wells Sampling included the following

- Identification of residences located within the area of interest (Figures 1 and 2)
- Communication with residents within the area of interest via:
  - Notification letters mailed prior to Residential Well Sampling
  - Home visits during Residential Well Sampling
  - "Not-at-home" notification left at residences where contact could not be made with the occupants.
- Collection of drinking water samples for nitrate concentration field screening at residences where permission to collect samples was granted. Drinking water samples were screened in the field at the time of collection using Hach™ test strips to estimate nitrate concentrations.
- At residences where field screening samples indicated nitrate concentrations greater than 5 parts per million (ppm), drinking water samples were collected and delivered to TestAmerica Laboratory, Inc. (TestAmerica), a State of Washington accredited drinking water laboratory located in Spokane Valley, Washington for nitrate analysis by EPA Method 300.0.
- Following laboratory analysis, residences where detected nitrate concentrations in drinking water exceed the 10 mg/L MCL were offered RO treatment systems.
- Where offers of RO treatment systems were accepted, they were installed and will be maintained by the Dairies.
- For residences where RO systems were found to be in place, the Dairies offered professional maintenance of these systems at the Dairies cost.

2. Data Generation and Acquisition

2.1 Residence Identification and Communication

A Residential Well Sampling notification letter was sent to each of the 224 residences that were identified within the area of interest. The letters were sent to the residences on May 17, 2013. Table 1 presents the 224 residences by street address. The notification letter was presented in English and Spanish and included the following information:

- Notification of the purpose of the Residential Well Sampling
- Dates when sampling crews will be in the area
- An invitation for response to:
- Ask questions about the sampling
- Contact information for both the Project Coordinator (PC) and the U.S. Environmental Protection Agency (EPA) PC.

Responses to notification letters were documented and categorized as they were received. For residences where positive responses were received, sampling appointments were scheduled. For negative responses or non-respondent residences, the name and address associated with the residence was forwarded to the EPA PC by the ARCADIS PC. Model letters used to communicate with the residences (e.g., a generic offer to sample letter, letter offering to install a reverse osmosis unit, etc.) are presented in Appendix A.

Residences were visited by the ARCADIS field sampling teams beginning on May 28, 2013. Field sampling teams informed the residents of the Residential Well Sampling and requested permission to sample. Where permission was granted, samples were collected. For residences where permission was denied, the refusal was documented, and the name and address associated with the residence was forwarded to the EPA PC by the ARCADIS PC.

For residences where no one was present, a "not-at-home" note was left either on the door or in an area believed to readily visible by the resident. The names and addresses associated with "not-at-home" residences were forwarded to the EPA PC by the

ARCADIS PC. If a positive response for sampling was received as a result of the "not-at-home" note, a sampling appointment was scheduled with the resident. A follow-up round of visits to "not-at-home" residents who did not respond was completed on June 19 and 20, 2013. Residences that declined sampling via response to the initial notification letter were not visited by the field sampling teams.

2.2 Residential Well Sampling

Residential well sampling was initiated on May 28, 2013 and substantially completed by June 20, 2013; ARCADIS continued to sample residences who responded to the notification letter and/or "not-at-home" notification until June 20, 2013. Additionally, ARCADIS sampled seven (7) residential properties owned by the Dairies. Five of the seven where no resident response was received were sampled on September 18, 2013. Where residents granted permission for ARCADIS sampling crews to enter the premises, the sampling crews initially inquired as to presence or absence of (1) a reverse osmosis (RO) system or (2) a water treatment system (such as a water softener) at the residence. If an RO system was present, the sampling team documented that an RO system was present. The sampling team inquired if the RO system is professionally maintained, and if so, who performs the maintenance (including contact information, if available). Offers for professional RO system maintenance were made to all residences with existing RO systems.

Upon receiving permission to collect a water sample at the residence, an initial screening sample was collected. In most cases, samples were collected from an outside hose bib. Fifteen samples were collected inside a residence from the kitchen faucet. If a water softener was present, field sampling crews ensured that samples were collected upstream of the treatment system or the system was disconnected prior to collecting the sample.

The screening sample was analyzed using Hach™ test strips. If the Hach™ test strip indicated that the nitrate concentration was less than 5 mg/L, then no sample for laboratory analysis was collected. If the Hach™ test strip indicated that the nitrate concentration was equal to or greater than 5 mg/L, a sample for laboratory analysis was collected. In all cases, the result of the Hach™ test strip analysis was shared with the resident at the time of sampling and documented on the Residential Well Sampling Record and in the Hach™ test strip log. The Residential Well Sampling Records are presented in Appendix B.

Laboratory analytical results were used to determine the need for an offer of an RO treatment system. If the nitrate concentration was confirmed by laboratory analysis to be greater than 10 mg/L, an offer was made. If the nitrate concentration was less than 10 mg/L, no offer was made. In all cases, the laboratory analytical results were provided to both the resident (via U.S. Mail) and EPA.

2.2.1 Sampling Methods

This section presents the sampling methodology for the collection of screening and laboratory analytical samples from residences where positive responses to requests for sampling were obtained. As noted in Section 2.1, initial sampling activities focused on residences where positive responses were received from the initial request letter, followed by residences where permission was obtained by site visit. The sampling and site visit activities were conducted by a field team of two ARCADIS staff.

1) Ask the resident if an RO system or water softener is present at the residence.

2) If an RO system is present, visually observe the system to document the make and model. Ascertain and document if the system is professionally maintained. No sample was collected from the residence if an RO system was present..

3) If a water softener or other water treatment system is present, visually verify the location of the system and determine the appropriate location at the residence to collect a water sample upstream of the treatment system or ensure that the treatment system is in "bypass" mode during sampling.

4) Endeavor to collect the sample from an outdoor hose bib. Outside hose bibs are typically located upstream of treatment systems, and use of an outdoor sampling location eliminates the need to enter the residence, results in less inconvenience to the resident, and allows for purge water to be spread on the lawn or other outside area. If an outdoor hose bib is not present or accessible, collect the samples from a utility or kitchen area sink.

5) If an indoor faucet is used for sampling, remove any filters or aerators prior to sampling.

6) Don clean nitrile gloves and disinfect the hose bib or faucet prior to sampling using a disinfecting spray or wipe and then dry using a clean paper towel.

7) Fit variable width tubing over the disinfected hose bib or faucet and cut to an appropriate length to allow sampling. If necessary, hose clamps may be used to attach the tubing to the water supply.

8) After attaching tubing, run the water source for 5 minutes to remove stagnant water from the water system.

9) After 5 minutes, take a nitrate Hach™ test strip measurement, following manufacturer instructions.

10) Shut off the water.

11) Follow test strip manufacturer instructions to determine the nitrate concentration in the sample.

12) Record the results on the residence sample sheet and in the test strip result log and share the results with resident.

13) If the nitrate test strip indicates a nitrate concentration of less than 5 mg/L, disassemble the sampling equipment, restore the resident's property (e.g., aerators, filters, garden hose) to its original location prior to sampling, and depart location.

14) If the nitrate test strip indicates a nitrate concentration of 5 mg/L or greater, turn on water source and allow it to run for 1 minute.

15) Fill the sample bottle to within 1 inch of the top and seal with the lid. Do not overflow.

16) Collect duplicate samples for laboratory analysis at a frequency of one out of every ten samples.

17) Fill out the chain-of-custody form and sample bottle label, and record sample numbers on the residence sampling field sheet and sample log forms. Unique sample numbers for each residence are provided to the sample team by the Sampling Team Leader (STL) prior to sampling activities. If a duplicate sample is collected, follow the duplicate sample number guidance provided in Section 2.5.2 of the QAPP.

18) Place samples on ice in coolers for shipment to the laboratory.

19) Disassemble sampling equipment and restore resident's property (e.g., aerators, filters, garden hose) to its original location prior to sampling.

20) Prior to departing, collect and decontaminate all non-disposable sampling equipment (e.g., hose clamps, screwdrivers) using a disinfectant spray or wipe. All disposable sampling equipment (e.g., tubing, gloves, disinfectant wipes) will be contained in a garbage bag and disposed of in an appropriate trash receptacle identified by the STL at the end of each day.

21) Measure and record the GPS coordinates of the location for each well sampled. GPS data include latitude, longitude, and elevation. Coordinates are recorded in decimal degrees.

2.2.2 Sample Handling and Custody

All samples were accompanied by a chain-of-custody record. When custody of samples was transferred, the individuals relinquishing and receiving the samples signed and dated the chain-of-custody record. The chain-of-custody record documents the custody transfer from the sampler, often through another agent (shipping/transport company), to the laboratory sample custodian.

Prior to shipment, samples were packaged properly and a chain-of-custody record accompanied each shipping container. All shipping containers were sealed with custody seals for shipment/transport to the laboratory. Custody seals were placed in a manner that indicated if the container has been opened during shipment. Courier names and other pertinent information were documented on the chain-of-custody record. All shipments were accompanied by the chain-of-custody record that identifies the contents of the shipment. The original and one copy was included in the shipment, an additional copy was retained by the sampler and provided to the ARCADIS PC. All shipping documentation (e.g., freight bills) was retained as part of the chain-of-custody documentation by the ARCADIS PC.

All samples collected for laboratory nitrate concentration analysis were received by Ms. Cat Stapleton at TestAmerica located at 11922 E 1st Avenue, Spokane, Washington. Upon arrival at the laboratory, the TestAmerica sample custodian accepted custody of the samples from the carrier and entered information about the shipment into a sample receipt log that included the initials of the person delivering the

package and the status of custody seals on the containers. The sample custodian logged in the samples following the laboratory standard operating procedure (SOP). Following sample analysis, the unused portions of all samples were disposed of by TestAmerica in accordance with their laboratory SOP. A total of 12 sample delivery groups were submitted to the analytical laboratory; the delivery groups and collection dates are as follows:

Sample Delivery Group	Samples Collected	Date Received by Lab
SWE0197	May 28, 29, 2013	May 30, 2013
SWE0206	May 29 & 30, 2013	May 30, 2013
SWE0207	May 30, 2013	May 31, 2013
SWF0005	June 3, 2013	June 4, 2013
SWF0019	June 3 & 4, 2013	June 5, 2013
SWF0030	June 4 & 5, 2013	June 6, 2013
SWF0049	June 5 & 6, 2013	June 7, 2013
SWF0058	June 9 & 10, 2013	June 11, 2013
SWF0070	June 10, 2013	June 11, 2013
SWF0123	June 18 & 19, 2013	June 20, 2013
SWF0131	June 19 & 20, 2013	June 20, 2013
SWI0124	September 18, 2013	September 19, 2013

In addition to the chain-of-custody documentation described above, field sampling forms were completed at each residence and indicated if samples were collected, sample numbers, duplicate samples, and other pertinent information including significant events and observations that occurred during sampling activities. Sufficient information was noted on field sampling forms to enable participants to reconstruct events that occurred and to refresh the memory of field personnel, if needed (Appendix B). Original copies of all field forms and chain-of-custody documents were retained by the ARCADIS PC in the project files.

2.3 Analytical Methods

Residential well samples were analyzed for nitrate by EPA Method 300.0. Because of the 48-hour holding time for nitrate analysis by EPA Method 300.0, samples were shipped using an overnight delivery service each day (Monday through Thursday).

TestAmerica analyzed the samples immediately upon receipt to ensure holding time compliance. Analytical laboratory reports are presented in Appendix C.

2.4 Quality Control

This section presents the field and laboratory quality control (QC) requirements for Residential Wells Sampling.

2.4.1 Field Quality Control Samples

The Residential Wells Sampling included the collection of field QC samples including field duplicates and field blanks. The field duplicate samples were collected immediately following collection of target samples using the same collection procedures. Field duplicate samples were collected at a frequency of one in every ten samples. A field blank QC sample was prepared by the sampling team at the beginning of each sampling day by filling a sample bottle with laboratory supplied deionized water. The field blank was stored in the sample cooler for the duration of the sampling day. Field blanks were prepared for each sample cooler and were sent to the laboratory for analysis as part of the related sample delivery group.

Table 5 presents the quality control samples and subsequent results. In total, 16 duplicate pairs and 15 field blanks were collected throughout the duration of the sampling event. The results were presented in the data validation report generated for the sampling groups. The relative percent difference between the duplicate pair met the criteria as specified in the QAPP. In addition, no detections above laboratory reporting limits were reported in the field blanks, which met the field blank QC criteria. Eight (8) matrix spike and eight (8) matrix spike duplicates were prepared and analyzed by TestAmerica.

2.4.2 Laboratory Quality Control Procedures

Laboratory QC procedures included the following:

- Nitrate analysis of water samples according to EPA Method 300.0
- Instrument calibration and standards as defined in EPA Method 300.0
- Laboratory blank measurements at a minimum 5 percent or one per batch frequency

- Accuracy and precision measurements at a minimum of one in 20 or one per set
- Data reduction and reporting according to EPA Method 300.0
- Laboratory documentation according to EPA Method 300.0 and laboratory SOP requirements.

2.5 Data Management

All field data collected during the Residential Wells Sampling was recorded on field forms (Appendix B). Pertinent information, such as Hach™ test strip results, was transferred to an Excel spreadsheet.

The analytical data obtained from the laboratory is maintained in an electronic data management tool. All data underwent review and validation as described in Section 4. Five Data Usability Summary Reports, documenting the data validation for each of the sample delivery groups, were submitted to EPA during the course of the project. Data validation reports are presented in Appendix D.

In addition, the data are provided to the EPA in accordance with the procedures presented in "EPA Region 10 Monitoring and Analytical Data Deliverables Data Submission Process for Water Quality Exchange (WQX) Compatible Deliverables for Yakima Dairies (Docket No. SDWA-10-2013-0080), and "EPA Region 10 Geographic Information System Data Deliverable Guidance for Yakima Dairies (Docket No. SDWA-10-2013-0080). ARCADIS provides the complete data set in electronic format on the enclosed CD (Appendix F).

Data submitted to the EPA is provided in the requested format which is consistent with the examples provided by the EPA to ARCADIS.

3. Assessment

The Residential Well Sampling Report documents the following:

- All residences identified within the area of interest
- All efforts to contact residents to sample drinking water supplies
- All screening and laboratory analytical results

- Records of offers for treatments systems and resident responses.

Tables 1 through 10 provide a summary of the information and data generated as a result of the Residential Well Sampling effort. Figure 3 provides a depiction of (1) location of residences within the area of interest; (2) relative nitrate concentrations at sampled residences, and; (3) location of residences with existing RO systems within the area of interest. Figure 3 does not depict residences where sampling was refused or otherwise not conducted (as described in the following sections).

3.1 Residential Sampling Locations

A total of 224 residences were identified within the area of interest. One hundred eighty-two (182) residences were located one mile downgradient of the boundary of the Dairy Facilities. Forty-two (42) residences were located within the Dairy Facilities boundary. A summary of all the residences identified for the Residential Well Sampling and visited by ARCADIS personnel is presented in Table 1. Fifty (50) residences were identified as having an existing RO system (Table 2).

3.2 Field Screening

One hundred forty-one (141) residences gave permission to collect samples (does not include residences that were determined to have existing reverse osmosis [RO] systems installed). Field screening of 26 residences had Hach™ test strip results less than 5 mg/L (Table 3). Drinking water samples were not collected from these residences.

3.3 Analytical Results

One hundred fifteen (115) residences were identified for the collection of drinking water samples (Table 4). Fifteen (15) of these residences shared a common well with a nearby residence. A total of 100 residences were sampled for the analysis of nitrate in drinking water. A summary of quality control samples is presented in Table 5.

3.3.1 Result Less Than MCL

Analytical results of drinking water samples indicated that 49 residences had detected nitrate concentrations less than the MCL of 10 mg/L (Table 6). Three of these residences share a well having a nitrate concentration less than the MCL.

3.3.2 Result Greater Than MCL

Analytical results of drinking water samples indicated that 67 residences had detected nitrate concentrations equal to or greater than the MCL of 10 mg/L (Table 7). Twelve (12) residences share a well with a nitrate concentration greater than the MCL.

3.4 Treatment System Installations and Maintenance

Letters offering either the installation of an RO system or the maintenance of an existing system were mailed to residences that had a drinking water nitrate concentration greater than the MCL or an existing RO system, respectively. If a mailed offer letter was returned to ARCADIS as undeliverable, ARCADIS personnel hand-delivered the letter to the residence. At the time of this report, a total of 34 RO system installations and 15 RO system maintenance offers have been accepted.

Installation of new RO systems and maintenance of new and existing RO systems is performed by Pinnacle Plumbing & Heating, Inc. of Selah, Washington. Reverse osmosis system installation and maintenance work orders through December 20, 2013 are presented in Appendix E. At the time of this report, the Dairies have responded to all requests for new system installation or maintenance of existing systems.

3.4.1 Reverse Osmosis System Installations

A total of 36 RO system installations have been accepted (Table 8). Thirty-four (34) RO system installations were complete as of December 20, 2013. Two accepted RO system installations (RW-1139 and RW-1140) remain unscheduled, as the owner has been non-responsive to numerous attempts to schedule installation.

3.4.2 Existing RO System Maintenance

A total of 15 RO system maintenance offers have been accepted (Table 9). Fifteen (15) RO system maintenances have been completed as of December 20, 2013.

3.4.3 Not-At-Home and Refusal Residences

Information for the 36 residences that were "Not at Home", vacant, or access was refused is summarized in Table 10. Detail for these residences is as follows:

- Nineteen (19) "Not at Home" residences. ARCADIS visited these residences twice in an attempt to establish contact
- Four undeveloped lots
- Eight vacant homes
- Four refusals
- One parcel was found not to exist

4. Data Validation and Usability

4.1 Data Review, Verification, and Validation

Data verification was conducted by the laboratory prior to submission to the PC. Data review, validation, and verification performed by the laboratory comply with EPA Method 300.0 requirements and laboratory SOPs.

4.2 Verification and Validation Methods

Prior to submitting the analytical samples to the laboratory, the sampling team leader or a designate reviewed the field notes and chain of custody for accuracy and completeness. The notes were reviewed for appropriate documentation of the field work pertinent activities, including verifying complete residential information. The chain-of-custodies were reviewed for appropriate sample nomenclature and selected analysis.

The analytical data generated was reduced, validated, and reported by the laboratory as described in EPA Method 300.0 and laboratory SOPs. Data verification was performed by the laboratory for all analyses prior to the release of the data to ARCADIS. The laboratory archived the analytical data in their own laboratory data management system. In addition, the project chemist validated laboratory data upon receipt.

4.2.1 Validation

An ARCADIS chemist performed a Tier II data validation on each sample delivery group (SDG) for this project. The validation process was consistent with the National

Functional Guidelines (EPA 2010). As part of the Tier II procedure, the following table was completed for each analytical method within each SDG.

Method Specified	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Tier II Validation					
Holding times					
Reporting limits (units)					
Blanks					
Method blanks					
Equipment blanks					
Trip blanks					
Laboratory Control Sample (LCS)					
Laboratory Control Sample Duplicate (LCSD)					
LCS/LCSD Precision (RPD)					
Matrix Spike (MS)					
Matrix Spike Duplicate (MSD)					
MS/MSD Precision (RPD)					
Field/Lab Duplicate (RPD)					
Dilution Factor					

RSD Relative standard deviation
R Percent recovery
RPD Relative percent difference
D Percent difference

Method 300.0 within each SDG met the data quality objectives. The data were deemed usable for their intended purposes. In addition, for some of the SDGs, field blanks were used as the matrix spike, matrix spike duplicates. Data validation reports are presented in Appendix D.

4.3 Reconciliation with User Requirements

Analytical data results obtained during the Residential Wells Sampling was reconciled with precision, accuracy, and completeness criteria shown in Table 2 of the QAPP and presented in the Data Usability Summary Reports (Appendix F). In addition, the primary field sample results, the duplicate result and the relative percent differences (RPD) are presented in Table 5. For each field duplicate pair, the RPDs were within compliance criteria and no data were qualified. The RPDs ranged from zero to 7.6 percent.

Some variability was noted, but was within the acceptable criteria. The variability between parent and duplicate result could possibly be attributed to analytical variability inherent within the instrumentation.

5. References Cited

ARCADIS U.S., Inc. (ARCADIS). 2013 Residential Well Sampling Quality Assurance Project Plan. Administrative Order on Consent SDWA-10-2013-0080. Prepared for the Yakima Valley Dairies. April 26.

U.S. Environmental Protection Agency (EPA). 2001. EPA Requirements for Quality Assurance Project Plans (EPA QA/R-5). Office of Environmental Information, Washington, D.C. EPA/240/B-01/1003. March (reissued 2006).

EPA. 2002. Guidance for Quality Assurance Project Plans (EPA QA/G-5). Office of Environmental Information, Washington, D.C. EPA/240/R-02/009. December.

EPA. 2006. Guidance on Systematic Planning Using Data Quality Objectives Processes (EPA QA/G-4). Office of Environmental Information, Washington, D.C. EPA/240/B-06/001. February.

EPA. 2010. National Functional Guidelines for Inorganic Superfund Data Review. EPA/540/R-10/011. Contract Laboratory Program. January.

EPA. 2013. Administrative Order on Consent (AOC) Docket No. SDWA-10-2013-0080, March 19.

6.2 D & A Dairy and George DeRuyter & Son Dairy Certification

I certify under the penalty of law that this document and all attachments were prepared by me or under my direction or supervision in accordance with a system designed to assure that qualified personnel gathered and evaluated the information submitted. Based on my inquiry of any and all persons directly responsible for gathering and analyzing the information obtained, I certify that the information contained in or accompanying this submittal is to the best of my knowledge and belief, true, accurate and complete. As to those identified portion(s) of this submittal for which I cannot personally verify the accuracy, I certify that this submittal and all attachments were prepared in accordance with procedures designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those directly responsible for gathering the information, or the immediate supervisor of such person(s), the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

D & A Dairy, LLC (also known as D and A Dairy L.L.C.),
George DeRuyter & Son Dairy, L.L.C

Signature: Dan DeRuyter

Name: Dan DeRuyter

Title: Member

Date: 12/20/13

6.3 George & Margaret Certification

I certify under the penalty of law that this document and all attachments were prepared by me or under my direction or supervision in accordance with a system designed to assure that qualified personnel gathered and evaluated the information submitted. Based on my inquiry of any and all persons directly responsible for gathering and analyzing the information obtained, I certify that the information contained in or accompanying this submittal is to the best of my knowledge and belief, true, accurate and complete. As to those identified portion(s) of this submittal for which I cannot personally verify the accuracy, I certify that this submittal and all attachments were prepared in accordance with procedures designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those directly responsible for gathering the information, or the immediate supervisor of such person(s), the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

George & Margaret, L.L.C.

Signature:

Name: Dan DeRuyter

Title: Member

Date: 12/20/13

6.4 Liberty Dairy Certification

I certify under the penalty of law that this document and all attachments were prepared by me or under my direction or supervision in accordance with a system designed to assure that qualified personnel gathered and evaluated the information submitted. Based on my inquiry of any and all persons directly responsible for gathering and analyzing the information obtained, I certify that the information contained in or accompanying this submittal is to the best of my knowledge and belief, true, accurate and complete. As to those identified portion(s) of this submittal for which I cannot personally verify the accuracy, I certify that this submittal and all attachments were prepared in accordance with procedures designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those directly responsible for gathering the information, or the immediate supervisor of such person(s), the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Liberty Dairy, LLC and its associated dairy facility
H & S Bosma Dairy

Signature: Henry W Bosma

Name: Henry Bosma

Title: Partner

Date: 12-20-13

ARCADIS

Tables

Table 1
Summary of Residences
Residential Well Sampling
Yakima Valley Dairies

SDWA-10-2013-0080

	Sample No.	Number	Street	Owner/Occupant Last Name	Owner/Occupant First Name	Latitude (DD)	Longitude (DD)	Visit Date (2013)	Type	Sampled	Notes
1	RW-1001	[redacted]						6/2			Vacant lot; [redacted]
2	RW-1002							6/10			RO system present
3	RW-1003							6/2			RO system present
4	RW-1004							6/10			RO system present
5	RW-1005							6/2			RO system present
6	RW-1006							6/10			RO system present
7	RW-1007							6/19			RO system present - Same corresponds to RW-1205
8	RW-1008							6/3	Well Sample	6/3/2013 10:08	
9	RW-1009							6/19			Not home; left card (2nd attempt; first visit 6/3)
10	RW-1010							6/3			RO system present
11	RW-1011							5/30	Well Sample	5/30/2013 11:55	
12	RW-1012							5/30	Well Sample	5/30/2013 11:40	
13	RW-1013							6/3			RO system present
14	RW-1014							6/3	Well Sample	6/3/2013 19:07	
15	RW-1015							6/2			RO system present
16	RW-1016							6/2			Vacant
17	RW-1017							6/3	Well Sample	6/3/2013 10:07	
18	RW-1018							6/2			Hach test <5 ppm
19	RW-1019							6/2			RO system present
20	RW-1020							6/3	Well Sample	6/3/2013 13:15	
21	RW-1021							6/3			RO system present
22	RW-1022							6/19			RO system present; uncooperative occupant
23	RW-1023							6/3			Vacant; left card
24	RW-1024							6/19			Hach test <5 ppm
25	RW-1025							6/18	Well Sample	6/18/2013 19:06	
26	RW-1026							6/3	Well Sample	6/3/2013 13:03	
27	RW-1027							6/3	Well Sample	6/3/2013 13:46	
28	RW-1028							6/3			RO system present
29	RW-1029							6/18			RO system present
30	RW-1030							5/28	Well Sample	5/28/2013 14:35	
31	RW-1031							6/3	Well Sample	6/3/2013 17:26	
32	RW-1032							6/3			Hach test <5 ppm
33	RW-1033							6/3			Hach test <5 ppm
34	RW-1034							6/3			RO system present
35	RW-1035							6/5			Hach test <5 ppm
36	RW-1036							6/3			RO system present
37	RW-1037							6/3	Well Sample	6/3/2013 13:31	

Table 1
Summary of Residences
Residential Well Sampling
Yakima Valley Dairies

	Sample No.	Number	Street	Owner/Occupant Last Name	Owner/Occupant First Name	Latitude (DD)	Longitude (DD)	Visit Date (2013)	Type	Sampled	Notes
38	RW-1038	[redacted]						6/18			Not home; left card (2nd attempt; first visit 6/4)
39	RW-1039							6/4			Hach test <5 ppm
40	RW-1040							6/4			RO system present; shares well w/ RW-1042
41	RW-1041							6/3	Well Sample	6/3/2013 8:47	
42	RW-1042							6/4	Well Sample	6/4/2013 12:34	[redacted]
43	RW-1043							6/4			Hach test <5 ppm
44	RW-1044							5/28	Well Sample	5/28/2013 15:25	
45	RW-1045							5/28	Well Sample	5/28/2013 15:47	
46	RW-1046							5/28	Well Sample	5/28/2013 16:20	
47	RW-1047							5/28	Well Sample	5/28/2013 16:40	
48	RW-1048							6/4	Well Sample	6/4/2013 16:42	
49	RW-1049							5/28	Well Sample	5/28/2013 17:00	
50	RW-1050							5/28	Well Sample		Shares well w/ RW-1049
51	RW-1051							5/28	Well Sample	5/28/2013 17:25	
52	RW-1052							6/5			Vacant; left card
53	RW-1053							6/19			Hach test <5 ppm
54	RW-1054							5/28	Well Sample	5/28/2013 17:40	Same well as RW-1055
55	RW-1055							5/28	Well Sample		Same well as RW-1054
56	RW-1055A							5/28	Well Sample	5/28/2013 17:40	Same well as RW-1054
57	RW-1056							5/29			Hach test <5 ppm
58	RW-1057							6/18			Not home; left card (2nd attempt; first visit 6/4)
59	RW-1058							6/19			Not home; left card (2nd attempt; first visit 6/4)
60	RW-1059							6/19			Not home; left card (2nd attempt; first visit 6/4)
61	RW-1060							6/10			Hach test <5 ppm
62	RW-1061							6/6			Refusal; Do not sample
63	RW-1062							5/30	Well Sample	5/30/2013 10:05	
64	RW-1063							6/4			Hach test <5 ppm; owner denied access to outside water, insisted they fill sample from indoor faucet, protocols not followed
65	RW-1064							6/4	Well Sample	6/4/2013 14:00	
66	RW-1065							6/3			RO system present
67	RW-1066							5/29			RO system present
68	RW-1067							6/4			Hach test <5 ppm
69	RW-1068							6/5	Well Sample	6/5/2013 10:21	

Table 1
Summary of Residences
Residential Well Sampling
Yakima Valley Dairies

	Sample No.	Number	Street	Owner/Occupant Last Name	Owner/Occupant First Name	Latitude (DD)	Longitude (DD)	Visit Date (2013)	Type	Sampled	Notes
70	RW-1069	[redacted]						6/19			RO system present
71	RW-1070							6/3			Hach test <5 ppm
72	RW-1071							5/29			Hach test <5 ppm
73	RW-1072							6/3	Well Sample	6/3/2013 17:10	
74	RW-1073							6/4			Hach test <5 ppm
75	RW-1074							6/3			Hach test <5 ppm
76	RW-1075							6/4	Well Sample	6/4/2013 10:17	
77	RW-1076							6/19	Well Sample	6/19/2013 9:51	
78	RW-1077							6/19			Not home; left card (2nd attempt; first visit 6/4)
79	RW-1078							5/29	Well Sample	5/29/2013 16:33	RO system present @ kitchen sink
80	RW-1079							5/30			Vacant; [redacted] left card; left message [redacted]
81	RW-1080							5/30			RO system present
82	RW-1081							6/20			RO system present
83	RW-1082							6/6	Well Sample		Shares well w/ RW-1083
84	RW-1083							6/6	Well Sample	6/6/2013 10:52	
85	RW-1084							5/29	Well Sample	5/29/2013 15:20	
86	RW-1085							5/29	Well Sample	5/29/2013 8:15	
87	RW-1086							5/30	Well Sample	5/30/2013 8:55	
88	RW-1087							5/30	Well Sample	5/30/2013 10:15	
89	RW-1088							6/19			Not home; left card (2nd attempt; first visit 5/30)
90	RW-1089							5/30	Well Sample		Shares well w/ RW-1086
91	RW-1090A							5/30	Well Sample	5/30/2013 10:50	
92	RW-1090B							5/30	Well Sample	5/30/2013 10:55	
93	RW-1091							5/30	Well Sample	5/30/2013 15:38	
94	RW-1092							5/29	Well Sample	5/29/2013 15:40	
95	RW-1093							5/29	Well Sample	5/29/2013 8:57	
96	RW-1094							5/29	Well Sample	5/29/2013 9:18	
97	RW-1095							5/29	Well Sample	5/29/2013 9:30	
98	RW-1096							5/29	Well Sample	5/29/2013 9:45	
99	RW-1097							5/30	Well Sample	5/30/2013 13:55	
100	RW-1098							5/30	Well Sample		Shares well w/ RW-1097
101	RW-1099							5/29	Well Sample	5/29/2013 11:20	
102	RW-1100							5/29	Well Sample	5/29/2013 10:55	
103	RW-1101							5/29	Well Sample	5/29/2013 14:20	RO system present @ kitchen sink
104	RW-1102							5/30	Well Sample	5/30/2013 9:40	
105	RW-1103							5/29	Well Sample	5/29/2013 11:10	

Table 1
Summary of Residences
Residential Well Sampling
Yakima Valley Dairies

	Sample No.	Number	Street	Owner/Occupant Last Name	Owner/Occupant First Name	Latitude (DD)	Longitude (DD)	Visit Date (2013)	Type	Sampled	Notes
106	RW-1104	[redacted]						6/20			Not home; left card (2nd attempt; first visit 5/29)
107	RW-1105							6/20	Well Sample	6/20/2013 9:55	
108	RW-1106							5/29			Vacant
109	RW-1107							5/29	Well Sample	5/29/2013 12:25	
110	RW-1108							5/29	Well Sample	5/29/2013 14:00	
111	RW-1109							5/29	Well Sample		Shares well w/ RW-1108
112	RW-1110							5/30	Well Sample	5/30/2013 14:30	
113	RW-1111							6/18	Well Sample	6/18/2013 19:28	
114	RW-1112							6/19	Well Sample	6/19/2013 17:52	
115	RW-1113							6/6			RO system present
116	RW-1114							6/19	Well Sample	6/19/2013 17:05	
117	RW-1115							6/4	Well Sample	6/4/2013 18:25	
118	RW-1116							6/4	Well Sample	6/4/2013 19:45	
119	RW-1117							6/19			Not home; left card (2nd attempt; first visit 6/4)
120	RW-1118							6/19	Well Sample	6/19/2013 17:20	
121	RW-1119							6/4	Well Sample		Shares well w/ RW-1115
122	RW-1120							6/4			RO system present
123	RW-1121							6/4	Well Sample	6/4/2013 17:52	
124	RW-1122							6/4	Well Sample	6/4/2013 18:10	
125	RW-1123							6/4			RO system present
126	RW-1124							6/4	Well Sample	6/4/2013 17:34	
127	RW-1125							5/28	Well Sample	5/28/2013 16:05	
128	RW-1126							6/4	Well Sample		Shares well w/ RW-1127
129	RW-1127							6/4	Well Sample	6/4/2013 17:06	
130	RW-1128							6/4	Well Sample		Shares well w/ RW-1127
131	RW-1129							9/18	Well Sample	9/18/2013 13:20	Sampled 9/18; (not home; left card - 1st visit 6/5; 2nd visit 6/19)
132	RW-1130							6/5	Well Sample	6/5/2013 13:41	
133	RW-1131							6/19			Hach test <5 ppm
134	RW-1132							6/5			Hach test <5 ppm
135	RW-1133							6/20			RO system present
136	RW-1134							6/19	Well Sample	6/19/2013 14:14	
137	RW-1135							6/19			Refusal
138	RW-1136							6/5			RO system present
139	RW-1137							6/19			Not home; left card (2nd attempt; first visit 6/5)
140	RW-1138							6/5			RO system present
141	RW-1139							6/5	Well Sample	6/5/2013 17:19	

Table 1
Summary of Residences
Residential Well Sampling
Yakima Valley Dairies

	Sample No.	Number	Street	Owner/Occupant Last Name	Owner/Occupant First Name	Latitude (DD)	Longitude (DD)	Visit Date (2013)	Type	Sampled	Notes
142	RW-1140	[redacted]						6/5	Well Sample		Shares well w/ RW-1139
143	RW-1141							6/6	Well Sample	6/6/2013 11:16	
144	RW-1142							6/6	Well Sample	6/6/2013 14:08	
145	RW-1143							6/6	Well Sample		Shares well w/ RW-1142
146	RW-1144							6/3			Vacant; left card
147	RW-1145							6/5	Well Sample	6/5/2013 17:56	
148	RW-1146							6/5			RO system present
149	RW-1147							6/5			Vacant; left card
150	RW-1148							6/19			Not home; left card [redacted]; 2nd attempt; first visit 6/6)
151	RW-1149							5/29	Well Sample	5/29/2013 11:50	RO system present @ kitchen sink
152	RW-1150							5/30			RO system present
153	RW-1151							6/6			RO system present
154	RW-1152							5/29	Well Sample	5/29/2013 16:00	
155	RW-1153							6/5	Well Sample	6/5/2013 18:32	
156	RW-1154							6/5			Hach test <5 ppm
157	RW-1155							6/19			Refusal
158	RW-1156							6/19			Not home; left card (2nd attempt; first visit 6/5)
159	RW-1157							6/19			Not home; left card (2nd attempt; first visit 6/5)
160	RW-1158							5/29	Well Sample	5/29/2013 10:08	RO system present @ kitchen sink
161	RW-1159							6/3	Well Sample	6/3/2013 10:31	
162	RW-1160							6/5	Well Sample	6/5/2013 12:23	
163	RW-1161							6/5	Well Sample	6/5/2013 12:11	
164	RW-1162							6/20			RO system present
165	RW-1163							6/6			Hach test <5 ppm
166	RW-1164							6/5			RO system present
167	RW-1165							6/5	Well Sample	6/5/2013 19:26	
168	RW-1166							6/20			RO system present
169	RW-1167							6/20			Not home; left card (2nd attempt; first visit 6/6)
170	RW-1168							6/20			Not home; left card (2nd attempt; first visit 6/6)
171	RW-1169							6/10	Well Sample	6/10/2013 15:08	
172	RW-1170							6/6			RO system present
173	RW-1171							5/30	Well Sample	5/30/2013 15:00	
174	RW-1172							5/29	Well Sample	5/29/2013 14:35	

Table 1
Summary of Residences
Residential Well Sampling
Yakima Valley Dairies

	Sample No.	Number	Street	Owner/Occupant Last Name	Owner/Occupant First Name	Latitude (DD)	Longitude (DD)	Visit Date (2013)	Type	Sampled	Notes
175	RW-1173	[redacted]						5/30			RO system present
176	RW-1174							5/30			RO system present
177	RW-1175							6/20			Not home; left card (2nd attempt; first visit 6/3)
178	RW-1176							6/6			RO system present
179	RW-1177							6/19	Well Sample	6/19/2013 20:15	
180	RW-1178							6/19	Well Sample	6/19/2013 20:29	
181	RW-1179							6/3	Well Sample	6/3/2013 16:42	
182	RW-1180							6/4			Refusal; [redacted]; left card [redacted]
183	RW-1201							6/19			Not home; left card (2nd attempt; first visit 6/10)
184	RW-1202							6/10			No home present
185	RW-1203							6/19	Well Sample	6/19/2013 18:52	
186	RW-1204							6/10	Well Sample	6/10/2013 18:40	
187	RW-1205							6/10			RO system present; previously listed as RW-1007
188	RW-1206							6/10			Parcel does not exist
189	RW-1207							6/10			RO system present
190	RW-1208							6/10			Hach test <5 ppm
191	RW-1209							6/10			Hach test <5 ppm; [redacted]
192	RW-1210							6/20	Well Sample	6/20/2013 8:00	
193	RW-1211							6/10	Well Sample	6/10/2013 16:40	
194	RW-1212							6/10	Well Sample	6/10/2013 16:00	Shares well w/ RW-1212A
195	RW-1212A							9/18	Well Sample	9/18/2013 12:28	Sampled 9/18; (not home; left card - 6/10)
196	RW-1213							9/18			Hach test <5 ppm 9/18; (two homes on property; not home; left card 6/10; no one home in Unit 2)
197	RW-1214							6/9	Well Sample	6/9/2013 18:12	
198	RW-1215							6/10			No home present
199	RW-1216							6/10	Well Sample	6/10/2013 17:02	
200	RW-1217							6/10			RO system present
201	RW-1218							6/10	Well Sample	6/10/2013 17:55	
202	RW-1219							6/10	Well Sample	6/10/2013 18:10	
203	RW-1220							6/10			RO system present
204	RW-1221							6/9	Well Sample	6/9/2013 19:28	Shares well w/ RW-1222 & RW-1223
205	RW-1222							6/9	Well Sample		Shares well w/ RW-1221

Table 1
Summary of Residences
Residential Well Sampling
Yakima Valley Dairies

	Sample No.	Number	Street	Owner/Occupant Last Name	Owner/Occupant First Name	Latitude (DD)	Longitude (DD)	Visit Date (2013)	Type	Sampled	Notes
206	RW-1223	[redacted]						6/9			RO system present; shares well w/ RW-1221
207	RW-1224							6/9	Well Sample	6/9/2013 16:00	
208	RW-1225							6/9			No home present
209	RW-1226							6/19			Hach test <5 ppm
210	RW-1227							9/18	Well Sample	9/18/2013 14:05	Sampled 9/18; (not home; left card - 1st visit 6/10; 2nd visit 6/19)
211	RW-1228							6/19	Well Sample	6/19/2013 19:43	
212	RW-1229							6/20			Not home; left card (2nd attempt; first visit 6/10)
213	RW-1230							6/10	Well Sample	6/10/2013 11:19	Owner did not give name
214	RW-1231							6/19			Not home; left card (2nd attempt; first visit 6/10)
215	RW-1232							6/19			Not home; left card (2nd attempt; first visit 6/10)
216	RW-1233							6/10			No home present
217	RW-1234							6/19			Not home; left card (2nd attempt; first visit 6/10)
218	RW-1235							6/9	Well Sample	6/9/2013 18:32	
219	RW-1235A							6/19			Hach test <5 ppm; separate well - same parcel as RW-1235
220	RW-1236							6/9	Well Sample		Shares well w/ RW-1235
221	RW-1237							6/9	Well Sample	6/9/2013 19:00	
222	RW-1238							6/9	Well Sample	6/9/2013 19:44	
223	RW-1239							6/10			RO system present
224	RW-1240							9/18			Hach test <5 ppm - 9/18; (not home; left card - 1st visit 6/10; 2nd visit 6/19)

NOTES

DD - Decimal Degrees
mg/l - milligrams per liter
RO - Reverse Osmosis

Table 2
Existing Reverse Osmosis Systems
Residential Well Sampling
Yakima Valley Dairies

	Sample No.	Number	Street	Owner/Occupant Last Name	Owner/Occupant First Name	Latitude (DD)	Longitude (DD)	Visit Date (2013)	Notes
1	RW-1002	[redacted]						6/10	RO system present
2	RW-1003							6/2	RO system present
3	RW-1004							6/10	RO system present
4	RW-1005							6/2	RO system present
5	RW-1006							6/10	RO system present
6	RW-1007							6/19	RO system present - previously listed as RW-1205
7	RW-1010							6/3	RO system present
8	RW-1013							6/3	RO system present
9	RW-1015							6/2	RO system present
10	RW-1019							6/2	RO system present
11	RW-1021							6/3	RO system present
12	RW-1022							6/19	RO system present; uncooperative occupant
13	RW-1028							6/3	RO system present
14	RW-1029							6/18	RO system present
15	RW-1034							6/3	RO system present
16	RW-1036							6/3	RO system present
17	RW-1040							6/4	RO system present; shares well w/ RW-1042
18	RW-1065							6/3	RO system present
19	RW-1066							5/29	RO system present
20	RW-1069							6/19	RO system present
21	RW-1078							5/29	RO system present @ kitchen sink
22	RW-1080							5/30	RO system present
23	RW-1081							6/20	RO system present
24	RW-1101							5/29	RO system present @ kitchen sink
25	RW-1113							6/6	RO system present
26	RW-1120							6/4	RO system present
27	RW-1123							6/4	RO system present
28	RW-1128							6/4	RO System present - shares well with RW-1127
29	RW-1133							6/20	RO system present
30	RW-1136							6/5	RO system present
31	RW-1138							6/5	RO system present
32	RW-1146							6/5	RO system present
33	RW-1149							5/29	RO system present @ kitchen sink
34	RW-1150							5/30	RO system present
35	RW-1151							6/6	RO system present
36	RW-1158							5/29	RO system present @ kitchen sink
37	RW-1162							6/20	RO system present
38	RW-1164							6/5	RO system present
39	RW-1166							6/20	RO system present

Table 2
Existing Reverse Osmosis Systems
Residential Well Sampling
Yakima Valley Dairies

	Sample No.	Number	Street	Owner/Occupant Last Name	Owner/Occupant First Name	Latitude (DD)	Longitude (DD)	Visit Date (2013)	Notes
40	RW-1170	[redacted]						6/6	RO system present
41	RW-1173							5/30	RO system present
42	RW-1174							5/30	RO system present
43	RW-1176							6/6	RO system present
44	RW-1201							6/19	RO system present
45	RW-1205							6/10	RO system present; previously listed as RW-1007
46	RW-1207							6/10	RO system present
47	RW-1217							6/10	RO system present
48	RW-1220							6/10	RO system present
49	RW-1223							6/9	RO system present; shares well w/ RW-1221
50	RW-1231							6/19	RO system present
51	RW-1239							6/10	RO system present

NOTES

DD - Decimal Degrees
mg/l - milligrams per liter
RO - Reverse Osmosis

Table 3
Hach Test Results Less Than 5 PPM
Residential Well Sampling
Yakima Valley Dairies

	Sample No.	Number	Street	Owner/Occupant Last Name	Owner/Occupant First Name	Latitude (DD)	Longitude (DD)	Visit Date (2013)	Notes
1	RW-1018	[redacted]						6/2	Hach test <5 ppm
2	RW-1024							6/19	Hach test <5 ppm
3	RW-1032							6/3	Hach test <5 ppm
4	RW-1033							6/3	Hach test <5 ppm
5	RW-1035							6/5	Hach test <5 ppm
6	RW-1039							6/4	Hach test <5 ppm
7	RW-1043							6/4	Hach test <5 ppm
8	RW-1053							6/19	Hach test <5 ppm
9	RW-1056							5/29	Hach test <5 ppm
10	RW-1060							6/10	Hach test <5 ppm
11	RW-1063							6/4	Hach test <5 ppm; owner denied access to outside water, insisted they fill sample from indoor faucet, protocols not followed
12	RW-1067							6/4	Hach test <5 ppm
13	RW-1070							6/3	Hach test <5 ppm
14	RW-1071							5/29	Hach test <5 ppm
15	RW-1073							6/4	Hach test <5 ppm
16	RW-1074							6/3	Hach test <5 ppm
17	RW-1131							6/19	Hach test <5 ppm
18	RW-1132							6/5	Hach test <5 ppm
19	RW-1154							6/5	Hach test <5 ppm
20	RW-1163							6/6	Hach test <5 ppm
21	RW-1208							6/10	Hach test <5 ppm
22	RW-1209							6/10	Hach test <5 ppm: [redacted]
23	RW-1213							9/18	Hach test <5 ppm 9/18; ([redacted] not home; left card 6/10; no one home [redacted]
24	RW-1226							6/19	Hach test <5 ppm
25	RW-1235A							6/19	Hach test <5 ppm
26	RW-1240							9/18	Hach test <5 ppm - 9/18; (not home; left card - 1st visit 6/10; 2nd visit 6/19)

NOTES

DD - Decimal Degrees
ppm - parts per million

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Table 4
Drinking Water Sampling Results
Residential Well Sampling
Yakima Valley Dairies

SDWA-10-2013-0080

	Sample No.	Number	Street	Owner/Occupant Last Name	Owner/Occupant First Name	Latitude (DD)	Longitude (DD)	Visit Date (2013)	Type	Sampled	Sample Delivery Group	Analytical Method	Analyte	Result	Units	Qualifier	Notes
1	RW-1008	[redacted]						6/3	Well Sample	6/3/2013 10:08	SWF0005	EPA 300.0	Nitrate-Nitrogen	20	mg/l		
2	RW-1011							5/30	Well Sample	5/30/2013 11:55	SWE0206	EPA 300.0	Nitrate-Nitrogen	30.6	mg/l		
3	RW-1012							5/30	Well Sample	5/30/2013 11:40	SWE0206	EPA 300.0	Nitrate-Nitrogen	5.63	mg/l		
4	RW-1014							6/3	Well Sample	6/3/2013 19:07	SWF0019	EPA 300.0	Nitrate-Nitrogen	50.9	mg/l		
5	RW-1017							6/3	Well Sample	6/3/2013 10:07	SWF0005	EPA 300.0	Nitrate-Nitrogen	15.9	mg/l		
6	RW-1020							6/3	Well Sample	6/3/2013 13:15	SWF0005	EPA 300.0	Nitrate-Nitrogen	5.4	mg/l		
7	RW-1025							6/18	Well Sample	6/18/2013 19:06	SWF0123	EPA 300.0	Nitrate-Nitrogen	6.16	mg/l		
8	RW-1026							6/3	Well Sample	6/3/2013 13:03	SWF0005	EPA 300.0	Nitrate-Nitrogen	8.3	mg/l		
9	RW-1027							6/3	Well Sample	6/3/2013 13:46	SWF0005	EPA 300.0	Nitrate-Nitrogen	5	mg/l		
10	RW-1030							5/28	Well Sample	5/28/2013 14:35	SWE0197	EPA 300.0	Nitrate-Nitrogen	7.59	mg/l		
11	RW-1031							6/3	Well Sample	6/3/2013 17:26	SWF0019	EPA 300.0	Nitrate-Nitrogen	5.5	mg/l		
12	RW-1037							6/3	Well Sample	6/3/2013 13:31	SWF0005	EPA 300.0	Nitrate-Nitrogen	5.3	mg/l		
13	RW-1041							6/3	Well Sample	6/3/2013 8:47	SWF0005	EPA 300.0	Nitrate-Nitrogen	36.8	mg/l		
14	RW-1042							6/4	Well Sample	6/4/2013 12:34	SWF0019	EPA 300.0	Nitrate-Nitrogen	39.3	mg/l		
15	RW-1044							5/28	Well Sample	5/28/2013 15:25	SWE0197	EPA 300.0	Nitrate-Nitrogen	8.19	mg/l		
16	RW-1045							5/28	Well Sample	5/28/2013 15:47	SWE0197	EPA 300.0	Nitrate-Nitrogen	15.3	mg/l		
17	RW-1046							5/28	Well Sample	5/28/2013 16:20	SWE0197	EPA 300.0	Nitrate-Nitrogen	9.98	mg/l		
18	RW-1047							5/28	Well Sample	5/28/2013 16:40	SWE0197	EPA 300.0	Nitrate-Nitrogen	10.2	mg/l		
19	RW-1048							6/4	Well Sample	6/4/2013 16:42	SWF0030	EPA 300.0	Nitrate-Nitrogen	9.4	mg/l		
20	RW-1049							5/28	Well Sample	5/28/2013 17:00	SWE0197	EPA 300.0	Nitrate-Nitrogen	9.36	mg/l		
21	RW-1050							5/28	Well Sample			EPA 300.0	Nitrate-Nitrogen	9.36	mg/l		Shares well w/ RW-1049
22	RW-1051							5/28	Well Sample	5/28/2013 17:25	SWE0197	EPA 300.0	Nitrate-Nitrogen	17.1	mg/l		
23	RW-1054							5/28	Well Sample	5/28/2013 17:40	SWE0197	EPA 300.0	Nitrate-Nitrogen	10.2	mg/l		
24	RW-1055							5/28	Well Sample			EPA 300.0	Nitrate-Nitrogen	10	mg/l		Shares well w/ RW-1054
25	RW-1062							5/30	Well Sample	5/30/2013 10:05	SWE0206	EPA 300.0	Nitrate-Nitrogen	3.67	mg/l		
26	RW-1064							6/4	Well Sample	6/4/2013 14:00	SWF0019	EPA 300.0	Nitrate-Nitrogen	8.74	mg/l		
27	RW-1068							6/5	Well Sample	6/5/2013 10:21	SWF0030	EPA 300.0	Nitrate-Nitrogen	30.7	mg/l		
28	RW-1072							6/3	Well Sample	6/3/2013 17:10	SWF0019	EPA 300.0	Nitrate-Nitrogen	4.86	mg/l		
29	RW-1075							6/4	Well Sample	6/4/2013 10:17	SWF0019	EPA 300.0	Nitrate-Nitrogen	11.3	mg/l		
30	RW-1076							6/19	Well Sample	6/19/2013 9:51	SWF0123	EPA 300.0	Nitrate-Nitrogen	9.58	mg/l		
31	RW-1078							5/29	Well Sample	5/29/2013 16:33	SWE0206	EPA 300.0	Nitrate-Nitrogen	12.4	mg/l		RO system present @ kitchen sink
32	RW-1082							6/6	Well Sample			EPA 300.0	Nitrate-Nitrogen	36.5	mg/l		Shares well w/ RW-1083
33	RW-1083							6/6	Well Sample	6/6/2013 10:52	SWF0049	EPA 300.0	Nitrate-Nitrogen	36.5	mg/l		
34	RW-1084							5/29	Well Sample	5/29/2013 15:20	SWE0206	EPA 300.0	Nitrate-Nitrogen	7.91	mg/l		
35	RW-1085							5/29	Well Sample	5/29/2013 8:15	SWE0197	EPA 300.0	Nitrate-Nitrogen	8	mg/l		
36	RW-1086							5/30	Well Sample	5/30/2013 8:55	SWE0206	EPA 300.0	Nitrate-Nitrogen	16.8	mg/l		
37	RW-1087							5/30	Well Sample	5/30/2013 10:15	SWE0206	EPA 300.0	Nitrate-Nitrogen	3.82	mg/l		
38	RW-1089							5/30	Well Sample			EPA 300.0	Nitrate-Nitrogen	16.8	mg/l		Shares well w/ RW-1086
39	RW-1090A							5/30	Well Sample	5/30/2013 10:50	SWE0206	EPA 300.0	Nitrate-Nitrogen	23.8	mg/l		
40	RW-1090B							5/30	Well Sample	5/30/2013 10:55	SWE0206	EPA 300.0	Nitrate-Nitrogen	23	mg/l		
41	RW-1091							5/30	Well Sample	5/30/2013 15:38	SWE0207	EPA 300.0	Nitrate-Nitrogen	3.12	mg/l		
42	RW-1092							5/29	Well Sample	5/29/2013 15:40	SWE0206	EPA 300.0	Nitrate-Nitrogen	8.3	mg/l		
43	RW-1093							5/29	Well Sample	5/29/2013 8:57	SWE0197	EPA 300.0	Nitrate-Nitrogen	7.87	mg/l		

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Table 4
Drinking Water Sampling Results
Residential Well Sampling
Yakima Valley Dairies

SDWA-10-2013-0080

	Sample No.	Number	Street	Owner/Occupant Last Name	Owner/Occupant First Name	Latitude (DD)	Longitude (DD)	Visit Date (2013)	Type	Sampled	Sample Delivery Group	Analytical Method	Analyte	Result	Units	Qualifier	Notes
44	RW-1094	[redacted]						5/29	Well Sample	5/29/2013 9:18	SWE0197	EPA 300.0	Nitrate-Nitrogen	4.59	mg/l		
45	RW-1095							5/29	Well Sample	5/29/2013 9:30	SWE0197	EPA 300.0	Nitrate-Nitrogen	11.8	mg/l		
46	RW-1096							5/29	Well Sample	5/29/2013 9:45	SWE0197	EPA 300.0	Nitrate-Nitrogen	16	mg/l		
47	RW-1097							5/30	Well Sample	5/30/2013 13:55	SWE0207	EPA 300.0	Nitrate-Nitrogen	10.1	mg/l		
48	RW-1098							5/30	Well Sample			EPA 300.0	Nitrate-Nitrogen	10.1	mg/l		Shares well w/ RW-1097
49	RW-1099							5/29	Well Sample	5/29/2013 11:20	SWE0197	EPA 300.0	Nitrate-Nitrogen	14	mg/l		
50	RW-1100							5/29	Well Sample	5/29/2013 10:55	SWE0197	EPA 300.0	Nitrate-Nitrogen	10.9	mg/l		
51	RW-1101							5/29	Well Sample	5/29/2013 14:20	SWE0206	EPA 300.0	Nitrate-Nitrogen	18.2	mg/l		RO system present @ kitchen sink
52	RW-1102							5/30	Well Sample	5/30/2013 9:40	SWE0206	EPA 300.0	Nitrate-Nitrogen	18.2	mg/l		
53	RW-1103							5/29	Well Sample	5/29/2013 11:10	SWE0197	EPA 300.0	Nitrate-Nitrogen	12.3	mg/l		
54	RW-1105							6/20	Well Sample	6/20/2013 9:55	SWF0131	EPA 300.0	Nitrate-Nitrogen	8.58	mg/l		
55	RW-1107							5/29	Well Sample	5/29/2013 12:25	SWE0197	EPA 300.0	Nitrate-Nitrogen	10.4	mg/l		
56	RW-1108							5/29	Well Sample	5/29/2013 14:00	SWE0206	EPA 300.0	Nitrate-Nitrogen	20.3	mg/l		
57	RW-1109							5/29	Well Sample			EPA 300.0	Nitrate-Nitrogen	20.3	mg/l		Shares well w/ RW-1108
58	RW-1110							5/30	Well Sample	5/30/2013 14:30	SWE0207	EPA 300.0	Nitrate-Nitrogen	7.62	mg/l		
59	RW-1111							6/18	Well Sample	6/18/2013 19:28	SWF0123	EPA 300.0	Nitrate-Nitrogen	3.16	mg/l		
60	RW-1112							6/19	Well Sample	6/19/2013 17:52	SWF0131	EPA 300.0	Nitrate-Nitrogen	18.1	mg/l		
61	RW-1114							6/19	Well Sample	6/19/2013 17:05	SWF0131	EPA 300.0	Nitrate-Nitrogen	12.3	mg/l		
62	RW-1115							6/4	Well Sample	6/4/2013 18:25	SWF0030	EPA 300.0	Nitrate-Nitrogen	7.76	mg/l		
63	RW-1116							6/4	Well Sample	6/4/2013 19:45	SWF0030	EPA 300.0	Nitrate-Nitrogen	4.36	mg/l		
64	RW-1118							6/19	Well Sample	6/19/2013 17:20	SWF0131	EPA 300.0	Nitrate-Nitrogen	3.9	mg/l		
65	RW-1119							6/4	Well Sample			EPA 300.0	Nitrate-Nitrogen	7.76	mg/l		Shares well w/ RW-1115
66	RW-1121							6/4	Well Sample	6/4/2013 17:52	SWF0030	EPA 300.0	Nitrate-Nitrogen	15.6	mg/l		
67	RW-1122							6/4	Well Sample	6/4/2013 18:10	SWF0030	EPA 300.0	Nitrate-Nitrogen	26.9	mg/l		
68	RW-1124							6/4	Well Sample	6/4/2013 17:34	SWF0030	EPA 300.0	Nitrate-Nitrogen	18.6	mg/l		
69	RW-1125							5/28	Well Sample	5/28/2013 16:05	SWE0197	EPA 300.0	Nitrate-Nitrogen	10.5	mg/l		
70	RW-1126							6/4	Well Sample			EPA 300.0	Nitrate-Nitrogen	13.7	mg/l		Shares well w/ RW-1127
71	RW-1127							6/4	Well Sample	6/4/2013 17:06	SWF0030	EPA 300.0	Nitrate-Nitrogen	13.7	mg/l		
72	RW-1128							6/4	Well Sample			EPA 300.0	Nitrate-Nitrogen	13.7	mg/l		Shares well w/ RW-1127
73	RW-1129							9/18	Well Sample	9/18/2013 13:20	SWI0124	EPA 300.0	Nitrate-Nitrogen	28.5	mg/l		Sampled 9/18; (not home; left card - 1st visit 6/5; 2nd visit 6/19)
74	RW-1130							6/5	Well Sample	6/5/2013 13:41	SWF0030	EPA 300.0	Nitrate-Nitrogen	3.4	mg/l		
75	RW-1134							6/19	Well Sample	6/19/2013 14:14	SWF0123	EPA 300.0	Nitrate-Nitrogen	7.08	mg/l		
76	RW-1139							6/5	Well Sample	6/5/2013 17:19	SWF0049	EPA 300.0	Nitrate-Nitrogen	30.6	mg/l		
77	RW-1140							6/5	Well Sample			EPA 300.0	Nitrate-Nitrogen	30.6	mg/l		Shares well w/ RW-1139
78	RW-1141							6/6	Well Sample	6/6/2013 11:16	SWF0049	EPA 300.0	Nitrate-Nitrogen	30.2	mg/l		
79	RW-1142							6/6	Well Sample	6/6/2013 14:08	SWF0049	EPA 300.0	Nitrate-Nitrogen	18.5	mg/l		
80	RW-1143							6/6	Well Sample			EPA 300.0	Nitrate-Nitrogen	18.5	mg/l		Shares well w/ RW-1142
81	RW-1145							6/5	Well Sample	6/5/2013 17:56	SWF0049	EPA 300.0	Nitrate-Nitrogen	27.3	mg/l		
82	RW-1149							5/29	Well Sample	5/29/2013 11:50	SWE0197	EPA 300.0	Nitrate-Nitrogen	13.2	mg/l		RO system present @ kitchen sink
83	RW-1152							5/29	Well Sample	5/29/2013 16:00	SWE0206	EPA 300.0	Nitrate-Nitrogen	15.8	mg/l		
84	RW-1153							6/5	Well Sample	6/5/2013 18:32	SWF0049	EPA 300.0	Nitrate-Nitrogen	8.78	mg/l		

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Table 4
Drinking Water Sampling Results
Residential Well Sampling
Yakima Valley Dairies

SDWA-10-2013-0080

	Sample No.	Number	Street	Owner/Occupant Last Name	Owner/Occupant First Name	Latitude (DD)	Longitude (DD)	Visit Date (2013)	Type	Sampled	Sample Delivery Group	Analytical Method	Analyte	Result	Units	Qualifier	Notes
85	RW-1158	[redacted]						5/29	Well Sample	5/29/2013 10:08	SWE0197	EPA 300.0	Nitrate-Nitrogen	29.4	mg/l		RO system present @ kitchen sink
86	RW-1159							6/3	Well Sample	6/3/2013 10:31	SWF0005	EPA 300.0	Nitrate-Nitrogen	12	mg/l		
87	RW-1160							6/5	Well Sample	6/5/2013 12:23	SWF0030	EPA 300.0	Nitrate-Nitrogen	9.16	mg/l		
88	RW-1161							6/5	Well Sample	6/5/2013 12:11	SWF0030	EPA 300.0	Nitrate-Nitrogen	5.16	mg/l		
89	RW-1165							6/5	Well Sample	6/5/2013 19:26	SWF0049	EPA 300.0	Nitrate-Nitrogen	9.3	mg/l		
90	RW-1169							6/10	Well Sample	6/10/2013 15:08	SWF0070	EPA 300.0	Nitrate-Nitrogen	9.72	mg/l		
91	RW-1171							5/30	Well Sample	5/30/2013 15:00	SWE0207	EPA 300.0	Nitrate-Nitrogen	12.7	mg/l		
92	RW-1172							5/29	Well Sample	5/29/2013 14:35	SWE0206	EPA 300.0	Nitrate-Nitrogen	9.72	mg/l		
93	RW-1177							6/19	Well Sample	6/19/2013 20:15	SWF0131	EPA 300.0	Nitrate-Nitrogen	6.32	mg/l		
94	RW-1178							6/19	Well Sample	6/19/2013 20:29	SWF0131	EPA 300.0	Nitrate-Nitrogen	5.34	mg/l		
95	RW-1179							6/3	Well Sample	6/3/2013 16:42	SWF0019	EPA 300.0	Nitrate-Nitrogen	5.68	mg/l		
96	RW-1203							6/19	Well Sample	6/19/2013 18:52	SWF0131	EPA 300.0	Nitrate-Nitrogen	17.9	mg/l		
97	RW-1204							6/10	Well Sample	6/10/2013 18:40	SWF0070	EPA 300.0	Nitrate-Nitrogen	13.1	mg/l		
98	RW-1210							6/20	Well Sample	6/20/2013 8:00	SWF0131	EPA 300.0	Nitrate-Nitrogen	4.06	mg/l		
99	RW-1211							6/10	Well Sample	6/10/2013 16:40	SWF0070	EPA 300.0	Nitrate-Nitrogen	3.06	mg/l		
100	RW-1212							6/10	Well Sample	6/10/2013 16:00	SWF0070	EPA 300.0	Nitrate-Nitrogen	12.5	mg/l		Shares well w/ RW-1212A
101	RW-1212A							9/18	Well Sample	9/18/2013 12:28	SWI0124	EPA 300.0	Nitrate-Nitrogen	15.1	mg/l		Sampled 9/18; (not home; left card - 6/10)
102	RW-1214							6/9	Well Sample	6/9/2013 18:12	SWF0058	EPA 300.0	Nitrate-Nitrogen	12.7	mg/l		
103	RW-1216							6/10	Well Sample	6/10/2013 17:02	SWF0070	EPA 300.0	Nitrate-Nitrogen	4.56	mg/l		
104	RW-1218							6/10	Well Sample	6/10/2013 17:55	SWF0070	EPA 300.0	Nitrate-Nitrogen	26.6	mg/l		
105	RW-1219							6/10	Well Sample	6/10/2013 18:10	SWF0070	EPA 300.0	Nitrate-Nitrogen	31.1	mg/l		
106	RW-1221							6/9	Well Sample	6/9/2013 19:28	SWF0058	EPA 300.0	Nitrate-Nitrogen	13	mg/l		Shares well w/ RW-1222 & RW-1223
107	RW-1222							6/9	Well Sample			EPA 300.0	Nitrate-Nitrogen	13	mg/l		Shares well w/ RW-1221
108	RW-1224							6/9	Well Sample	6/9/2013 16:00	SWF0058	EPA 300.0	Nitrate-Nitrogen	9.26	mg/l		
109	RW-1227							9/18	Well Sample	9/18/2013 14:05	SWI0124	EPA 300.0	Nitrate-Nitrogen	51.6	mg/l		Sampled 9/18; (not home; left card - 1st visit 6/10; 2nd visit 6/19)
110	RW-1228							6/19	Well Sample	6/19/2013 19:43	SWF0131	EPA 300.0	Nitrate-Nitrogen	9.08	mg/l		
111	RW-1230							6/10	Well Sample	6/10/2013 11:19	SWF0058	EPA 300.0	Nitrate-Nitrogen	25.9	mg/l		Owner did not give name
112	RW-1235							6/9	Well Sample	6/9/2013 18:32	SWF0058	EPA 300.0	Nitrate-Nitrogen	6.16	mg/l		
113	RW-1236							6/9	Well Sample			EPA 300.0	Nitrate-Nitrogen	6.16	mg/l		Shares well w/ RW-1235
114	RW-1237							6/9	Well Sample	6/9/2013 19:00	SWF0058	EPA 300.0	Nitrate-Nitrogen	35.7	mg/l		
115	RW-1238							6/9	Well Sample	6/9/2013 19:44	SWF0058	EPA 300.0	Nitrate-Nitrogen	13.8	mg/l		

NOTES

DD - Decimal Degrees
mg/l - milligrams per liter

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Table 5
Analytical Quality Control Samples
Residential Well Sampling
Yakima Valley Dairies

SDWA-10-2013-0080

	Sample No.	Type	Sampled	Sample Delivery Group	Analytical Method	Analyte	Result	Parent Result	Units	Qualifier	RPD
1	RW-2068	Duplicate of RW-1068	6/5/2013 10:22	SWF0030	EPA 300.0	Nitrate-Nitrogen	29.4	30.7	mg/l		4.3%
2	RW-2075	Duplicate of RW-1075	6/4/2013 10:20	SWF0019	EPA 300.0	Nitrate-Nitrogen	11.2	11.3	mg/l		0.9%
3	RW-2093	Duplicate of RW-1093	5/29/2013 9:00	SWE0197	EPA 300.0	Nitrate-Nitrogen	7.84	7.87	mg/l		0.4%
4	RW-2100	Duplicate of RW-1100	5/29/2013 10:57	SWE0197	EPA 300.0	Nitrate-Nitrogen	10.9	10.9	mg/l		0.0%
5	RW-2102	Duplicate of RW-1102	5/30/2013 9:45	SWE0206	EPA 300.0	Nitrate-Nitrogen	18.4	18.2	mg/l		1.1%
6	RW-2107	Duplicate of RW-1107	5/29/2013 12:30	SWE0197	EPA 300.0	Nitrate-Nitrogen	10.4	10.4	mg/l		0.0%
7	RW-2112	Duplicate of RW-1112	6/19/2013 18:00	SWF0131	EPA 300.0	Nitrate-Nitrogen	17.5	18.1	mg/l		3.4%
8	RW-2127	Duplicate of RW-1127	6/4/2013 17:07	SWF0030	EPA 300.0	Nitrate-Nitrogen	14	13.7	mg/l		2.2%
9	RW-2129	Duplicate of RW-1129	9/18/2013 13:20	SWI0124	EPA 300.0	Nitrate-Nitrogen	27.1	28.5	mg/l		5.0%
10	RW-2134	Duplicate of RW-1134	6/19/2013 14:20	SWF0123	EPA 300.0	Nitrate-Nitrogen	7.2	7.08	mg/l		1.7%
11	RW-2141	Duplicate of RW-1141	6/6/2013 11:20	SWF0049	EPA 300.0	Nitrate-Nitrogen	32.6	30.2	mg/l		7.6%
12	RW-2152	Duplicate of RW-1152	5/29/2013 16:05	SWE0206	EPA 300.0	Nitrate-Nitrogen	15.6	15.8	mg/l		1.3%
13	RW-2159	Duplicate of RW-1159	6/3/2013 10:35	SWF0005	EPA 300.0	Nitrate-Nitrogen	12	12	mg/l		0.0%
14	RW-2210	Duplicate of RW-1210	6/20/2013 8:20	SWF0131	EPA 300.0	Nitrate-Nitrogen	3.78	4.06	mg/l		7.1%
15	RW-2212	Duplicate of RW-1212	6/10/2013 16:05	SWF0070	EPA 300.0	Nitrate-Nitrogen	12.3	12.5	mg/l		1.6%
16	RW-2224	Duplicate of RW-1224	6/9/2013 16:03	SWF0058	EPA 300.0	Nitrate-Nitrogen	9.28	9.26	mg/l		0.2%
17	RW-3025	Field Blank	6/18/2013 19:00	SWF0123	EPA 300.0	Nitrate-Nitrogen	0.2		mg/l	U	
18	RW-3030	Field Blank	5/28/2013 14:20	SWE0197	EPA 300.0	Nitrate-Nitrogen	0.2		mg/l	U	
19	RW-3041	Field Blank	6/3/2013 8:40	SWF0005	EPA 300.0	Nitrate-Nitrogen	0.2		mg/l	U	
20	RW-3048	Field Blank	6/4/2013 16:35	SWF0030	EPA 300.0	Nitrate-Nitrogen	0.2		mg/l	U	
21	RW-3083	Field Blank	6/6/2013 9:00	SWF0049	EPA 300.0	Nitrate-Nitrogen	0.2		mg/l	U	
22	RW-3085	Field Blank	5/29/2013 8:00	SWE0197	EPA 300.0	Nitrate-Nitrogen	0.2		mg/l	U	
23	RW-3086	Field Blank	5/30/2013 8:50	SWE0206	EPA 300.0	Nitrate-Nitrogen	0.2		mg/l	U	
24	RW-3097	Field Blank	5/30/2013 13:50	SWE0207	EPA 300.0	Nitrate-Nitrogen	0.2		mg/l	U	
25	RW-3108	Field Bank	5/29/2013 13:50	SWE0206	EPA 300.0	Nitrate-Nitrogen	0.2		mg/l	U	
26	RW-3114	Field Blank	6/19/2013 17:00	SWF0131	EPA 300.0	Nitrate-Nitrogen	0.2		mg/l	U	
27	RW-3139	Field Blank	6/5/2013 17:15	SWF0049	EPA 300.0	Nitrate-Nitrogen	0.2		mg/l	U	
28	RW-3169	Field Blank	6/10/2013 14:55	SWF0070	EPA 300.0	Nitrate-Nitrogen	0.2		mg/l	U	
29	RW-3179	Field Blank	6/3/2013 16:40	SWF0019	EPA 300.0	Nitrate-Nitrogen	0.2		mg/l	U	
30	RW-3212A	Field Blank	9/18/2013 11:30	SWI0124	EPA 300.0	Nitrate-Nitrogen	0.2		mg/l	U	
31	RW-3214	Field Blank	6/9/2013 18:05	SWF0058	EPA 300.0	Nitrate-Nitrogen	0.2		mg/l	U	
32	13E0178-MS1	MS/MSD of RW-2100	5/30/2013	SWE0197	EPA 300.0	Nitrate-Nitrogen	100		% Recovery		
33	13E0178-MSD1	MS/MSD of RW-2100	5/30/2013	SWE0197	EPA 300.0	Nitrate-Nitrogen	100		% Recovery		
34	13E0187-MS1	MS/MSD of RW-3097	5/31/2013	SWE0207	EPA 300.0	Nitrate-Nitrogen	95		% Recovery		
35	13E0187-MSD1	MS/MSD of RW-3097	5/31/2013	SWE0207	EPA 300.0	Nitrate-Nitrogen	94		% Recovery		
36	13F0022-MS1	MS/MSD of RW-3179	6/5/2013	SWF0019	EPA 300.0	Nitrate-Nitrogen	96.6		% Recovery		
37	13F0022-MSD1	MS/MSD of RW-3179	6/5/2013	SWF0019	EPA 300.0	Nitrate-Nitrogen	96.4		% Recovery		
38	13F0034-MS1	MS/MSD of RW-3048	6/6/2013	SWF0030	EPA 300.0	Nitrate-Nitrogen	97		% Recovery		
39	13F0034-MSD1	MS/MSD of RW-3048	6/6/2013	SWF0030	EPA 300.0	Nitrate-Nitrogen	97		% Recovery		

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Table 5
Analytical Quality Control Samples
Residential Well Sampling
Yakima Valley Dairies

	Sample No.	Type	Sampled	Sample Delivery Group	Analytical Method	Analyte	Result	Parent Result	Units	Qualifier	RPD
40	13F0043-MS1	MS/MSD of RW-3083	6/7/2013	SWF0049	EPA 300.0	Nitrate-Nitrogen	96.1		% Recovery		
41	13F0043-MSD1	MS/MSD of RW-3083	6/7/2013	SWF0049	EPA 300.0	Nitrate-Nitrogen	96.4		% Recovery		
42	13F0062-MS1	MS/MSD of RW-3214	6/11/2013	SWF0058	EPA 300.0	Nitrate-Nitrogen	93.7		% Recovery		
43	13F0062-MSD1	MS/MSD of RW-3214	6/11/2013	SWF0058	EPA 300.0	Nitrate-Nitrogen	94.2		% Recovery		
44	13F0067-MS1	MS/MSD of RW-3169	6/11/2013	SWF0070	EPA 300.0	Nitrate-Nitrogen	98.1		% Recovery		
45	13F0067-MSD1	MS/MSD of RW-3169	6/11/2013	SWF0070	EPA 300.0	Nitrate-Nitrogen	97.9		% Recovery		
46	13F0120-MS1	MS/MSD of RW-3025	6/20/2013	SWF0123	EPA 300.0	Nitrate-Nitrogen	93.9		% Recovery		
47	13F0120-MDS1	MS/MSD of RW-3025	6/20/2013	SWF0123	EPA 300.0	Nitrate-Nitrogen	94.6		% Recovery		

NOTES

RPD - Relative Percent Difference
mg/l - milligrams per liter
U - The compound was analyzed for but not detected. The result is the compound quantitation limit.
% Recovery - Percent Recovery

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Table 6
Drinking Water Sampling Results Less Than MCL
Residential Well Sampling
Yakima Valley Dairies

SDWA-10-2013-0080

	Sample No.	Number	Street	Owner/Occupant Last Name	Owner/Occupant First Name	Latitude (DD)	Longitude (DD)	Visit Date (2013)	Type	Sampled	Analytical Method	Analyte	Result	Units	Qualifier	Notes
1	RW-1012	[redacted]						5/30	Well Sample	5/30/2013 11:40	EPA 300.0	Nitrate-Nitrogen	5.63	mg/l		
2	RW-1020							6/3	Well Sample	6/3/2013 13:15	EPA 300.0	Nitrate-Nitrogen	5.4	mg/l		
3	RW-1025							6/18	Well Sample	6/18/2013 19:06	EPA 300.0	Nitrate-Nitrogen	6.16	mg/l		
4	RW-1026							6/3	Well Sample	6/3/2013 13:03	EPA 300.0	Nitrate-Nitrogen	8.3	mg/l		
5	RW-1027							6/3	Well Sample	6/3/2013 13:46	EPA 300.0	Nitrate-Nitrogen	5	mg/l		
6	RW-1030							5/28	Well Sample	5/28/2013 14:35	EPA 300.0	Nitrate-Nitrogen	7.59	mg/l		
7	RW-1031							6/3	Well Sample	6/3/2013 17:26	EPA 300.0	Nitrate-Nitrogen	5.5	mg/l		
8	RW-1037							6/3	Well Sample	6/3/2013 13:31	EPA 300.0	Nitrate-Nitrogen	5.3	mg/l		
9	RW-1044							5/28	Well Sample	5/28/2013 15:25	EPA 300.0	Nitrate-Nitrogen	8.19	mg/l		
10	RW-1046							5/28	Well Sample	5/28/2013 16:20	EPA 300.0	Nitrate-Nitrogen	9.98	mg/l		
11	RW-1048							6/4	Well Sample	6/4/2013 16:42	EPA 300.0	Nitrate-Nitrogen	9.4	mg/l		
12	RW-1049							5/28	Well Sample	5/28/2013 17:00	EPA 300.0	Nitrate-Nitrogen	9.36	mg/l		
13	RW-1050							5/28	Well Sample		EPA 300.0	Nitrate-Nitrogen	9.36	mg/l		Shares well w/ RW-1049
14	RW-1062							5/30	Well Sample	5/30/2013 10:05	EPA 300.0	Nitrate-Nitrogen	3.67	mg/l		
15	RW-1064							6/4	Well Sample	6/4/2013 14:00	EPA 300.0	Nitrate-Nitrogen	8.74	mg/l		
16	RW-1072							6/3	Well Sample	6/3/2013 17:10	EPA 300.0	Nitrate-Nitrogen	4.86	mg/l		
17	RW-1076							6/19	Well Sample	6/19/2013 9:51	EPA 300.0	Nitrate-Nitrogen	9.58	mg/l		
18	RW-1084							5/29	Well Sample	5/29/2013 15:20	EPA 300.0	Nitrate-Nitrogen	7.91	mg/l		
19	RW-1085							5/29	Well Sample	5/29/2013 8:15	EPA 300.0	Nitrate-Nitrogen	8	mg/l		
20	RW-1087							5/30	Well Sample	5/30/2013 10:15	EPA 300.0	Nitrate-Nitrogen	3.82	mg/l		
21	RW-1091							5/30	Well Sample	5/30/2013 15:38	EPA 300.0	Nitrate-Nitrogen	3.12	mg/l		
22	RW-1092							5/29	Well Sample	5/29/2013 15:40	EPA 300.0	Nitrate-Nitrogen	8.3	mg/l		
23	RW-1093							5/29	Well Sample	5/29/2013 8:57	EPA 300.0	Nitrate-Nitrogen	7.87	mg/l		
24	RW-1094							5/29	Well Sample	5/29/2013 9:18	EPA 300.0	Nitrate-Nitrogen	4.59	mg/l		
25	RW-1105							6/20	Well Sample	6/20/2013 9:55	EPA 300.0	Nitrate-Nitrogen	8.58	mg/l		
26	RW-1110							5/30	Well Sample	5/30/2013 14:30	EPA 300.0	Nitrate-Nitrogen	7.62	mg/l		
27	RW-1111							6/18	Well Sample	6/18/2013 19:28	EPA 300.0	Nitrate-Nitrogen	3.16	mg/l		
28	RW-1115							6/4	Well Sample	6/4/2013 18:25	EPA 300.0	Nitrate-Nitrogen	7.76	mg/l		
29	RW-1116							6/4	Well Sample	6/4/2013 19:45	EPA 300.0	Nitrate-Nitrogen	4.36	mg/l		
30	RW-1118							6/19	Well Sample	6/19/2013 17:20	EPA 300.0	Nitrate-Nitrogen	3.9	mg/l		
31	RW-1119							6/4	Well Sample		EPA 300.0	Nitrate-Nitrogen	7.76	mg/l		Shares well w/ RW-1115
32	RW-1130							6/5	Well Sample	6/5/2013 13:41	EPA 300.0	Nitrate-Nitrogen	3.4	mg/l		
33	RW-1134							6/19	Well Sample	6/19/2013 14:14	EPA 300.0	Nitrate-Nitrogen	7.08	mg/l		
34	RW-1153							6/5	Well Sample	6/5/2013 18:32	EPA 300.0	Nitrate-Nitrogen	8.78	mg/l		
35	RW-1160							6/5	Well Sample	6/5/2013 12:23	EPA 300.0	Nitrate-Nitrogen	9.16	mg/l		
36	RW-1161							6/5	Well Sample	6/5/2013 12:11	EPA 300.0	Nitrate-Nitrogen	5.16	mg/l		
37	RW-1165							6/5	Well Sample	6/5/2013 19:26	EPA 300.0	Nitrate-Nitrogen	9.3	mg/l		
38	RW-1169							6/10	Well Sample	6/10/2013 15:08	EPA 300.0	Nitrate-Nitrogen	9.72	mg/l		
39	RW-1172							5/29	Well Sample	5/29/2013 14:35	EPA 300.0	Nitrate-Nitrogen	9.72	mg/l		
40	RW-1177							6/19	Well Sample	6/19/2013 20:15	EPA 300.0	Nitrate-Nitrogen	6.32	mg/l		
41	RW-1178							6/19	Well Sample	6/19/2013 20:29	EPA 300.0	Nitrate-Nitrogen	5.34	mg/l		
42	RW-1179							6/3	Well Sample	6/3/2013 16:42	EPA 300.0	Nitrate-Nitrogen	5.68	mg/l		
43	RW-1210							6/20	Well Sample	6/20/2013 8:00	EPA 300.0	Nitrate-Nitrogen	4.06	mg/l		
44	RW-1211							6/10	Well Sample	6/10/2013 16:40	EPA 300.0	Nitrate-Nitrogen	3.06	mg/l		
45	RW-1216							6/10	Well Sample	6/10/2013 17:02	EPA 300.0	Nitrate-Nitrogen	4.56	mg/l		

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CONTAINS PERSONALLY IDENTIFIABLE INFORMATION

Table 6
Drinking Water Sampling Results Less Than MCL
Residential Well Sampling
Yakima Valley Dairies

SDWA-10-2013-0080

	Sample No.	Number	Street	Owner/Occupant Last Name	Owner/Occupant First Name	Latitude (DD)	Longitude (DD)	Visit Date (2013)	Type	Sampled	Analytical Method	Analyte	Result	Units	Qualifier	Notes
46	RW-1224	[redacted]						6/9	Well Sample	6/9/2013 16:00	EPA 300.0	Nitrate-Nitrogen	9.26	mg/l		
47	RW-1228							6/19	Well Sample	6/19/2013 19:43	EPA 300.0	Nitrate-Nitrogen	9.08	mg/l		
48	RW-1235							6/9	Well Sample	6/9/2013 18:32	EPA 300.0	Nitrate-Nitrogen	6.16	mg/l		
49	RW-1236							6/9	Well Sample		EPA 300.0	Nitrate-Nitrogen	6.16	mg/l		Shares well w/ RW-1235

NOTES

DD - Decimal Degrees
mg/l - milligrams per liter

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CONTAINS PERSONALLY IDENTIFIABLE INFORMATION

Table 7
Drinking Water Sampling Results Greater Than MCL
Residential Well Sampling
Yakima Valley Dairies

SDWA-10-2013-0080

	Sample No.	Number	Street	Owner/Occupant Last Name	Owner/Occupant First Name	Latitude (DD)	Longitude (DD)	Visit Date (2013)	Type	Sampled	Analytical Method	Analyte	Result	Units	Qualifier	Notes
1	RW-1008	[redacted]						6/3	Well Sample	6/3/2013 10:08	EPA 300.0	Nitrate-Nitrogen	20	mg/l		
2	RW-1011							5/30	Well Sample	5/30/2013 11:55	EPA 300.0	Nitrate-Nitrogen	30.6	mg/l		
3	RW-1014							6/3	Well Sample	6/3/2013 19:07	EPA 300.0	Nitrate-Nitrogen	50.9	mg/l		
4	RW-1017							6/3	Well Sample	6/3/2013 10:07	EPA 300.0	Nitrate-Nitrogen	15.9	mg/l		
5	RW-1041							6/3	Well Sample	6/3/2013 8:47	EPA 300.0	Nitrate-Nitrogen	36.8	mg/l		
6	RW-1042							6/4	Well Sample	6/4/2013 12:34	EPA 300.0	Nitrate-Nitrogen	39.3	mg/l		
7	RW-1045							5/28	Well Sample	5/28/2013 15:47	EPA 300.0	Nitrate-Nitrogen	15.3	mg/l		
8	RW-1047							5/28	Well Sample	5/28/2013 16:40	EPA 300.0	Nitrate-Nitrogen	10.2	mg/l		
9	RW-1051							5/28	Well Sample	5/28/2013 17:25	EPA 300.0	Nitrate-Nitrogen	17.1	mg/l		
10	RW-1054							5/28	Well Sample	5/28/2013 17:40	EPA 300.0	Nitrate-Nitrogen	10.2	mg/l		
11	RW-1055							5/28	Well Sample	5/28/2013 17:40	EPA 300.0	Nitrate-Nitrogen	10.2	mg/l		
12	RW-1068							6/5	Well Sample	6/5/2013 10:21	EPA 300.0	Nitrate-Nitrogen	30.7	mg/l		
13	RW-1075							6/4	Well Sample	6/4/2013 10:17	EPA 300.0	Nitrate-Nitrogen	11.3	mg/l		
14	RW-1078							5/29	Well Sample	5/29/2013 16:33	EPA 300.0	Nitrate-Nitrogen	12.4	mg/l		RO system present @ kitchen sink
15	RW-1082							6/6	Well Sample		EPA 300.0	Nitrate-Nitrogen	36.5	mg/l		Shares well w/ RW-1083
16	RW-1083							6/6	Well Sample	6/6/2013 10:52	EPA 300.0	Nitrate-Nitrogen	36.5	mg/l		
17	RW-1086							5/30	Well Sample	5/30/2013 8:55	EPA 300.0	Nitrate-Nitrogen	16.8	mg/l		
18	RW-1089							5/30	Well Sample		EPA 300.0	Nitrate-Nitrogen	16.8	mg/l		Shares well w/ RW-1086
19	RW-1090A							5/30	Well Sample	5/30/2013 10:50	EPA 300.0	Nitrate-Nitrogen	23.8	mg/l		
20	RW-1090B							5/30	Well Sample	5/30/2013 10:55	EPA 300.0	Nitrate-Nitrogen	23	mg/l		
21	RW-1095							5/29	Well Sample	5/29/2013 9:30	EPA 300.0	Nitrate-Nitrogen	11.8	mg/l		
22	RW-1096							5/29	Well Sample	5/29/2013 9:45	EPA 300.0	Nitrate-Nitrogen	16	mg/l		
23	RW-1097							5/30	Well Sample	5/30/2013 13:55	EPA 300.0	Nitrate-Nitrogen	10.1	mg/l		
24	RW-1098							5/30	Well Sample		EPA 300.0	Nitrate-Nitrogen	10.1	mg/l		Shares well w/ RW-1097
25	RW-1099							5/29	Well Sample	5/29/2013 11:20	EPA 300.0	Nitrate-Nitrogen	14	mg/l		
26	RW-1100							5/29	Well Sample	5/29/2013 10:55	EPA 300.0	Nitrate-Nitrogen	10.9	mg/l		
27	RW-1101							5/29	Well Sample	5/29/2013 14:20	EPA 300.0	Nitrate-Nitrogen	18.2	mg/l		RO system present @ kitchen sink
28	RW-1102							5/30	Well Sample	5/30/2013 9:40	EPA 300.0	Nitrate-Nitrogen	18.2	mg/l		
29	RW-1103							5/29	Well Sample	5/29/2013 11:10	EPA 300.0	Nitrate-Nitrogen	12.3	mg/l		
30	RW-1107							5/29	Well Sample	5/29/2013 12:25	EPA 300.0	Nitrate-Nitrogen	10.4	mg/l		
31	RW-1108							5/29	Well Sample	5/29/2013 14:00	EPA 300.0	Nitrate-Nitrogen	20.3	mg/l		
32	RW-1109							5/29	Well Sample		EPA 300.0	Nitrate-Nitrogen	20.3	mg/l		Shares well w/ RW-1108
33	RW-1112							6/19	Well Sample	6/19/2013 17:52	EPA 300.0	Nitrate-Nitrogen	18.1	mg/l		
34	RW-1114							6/19	Well Sample	6/19/2013 17:05	EPA 300.0	Nitrate-Nitrogen	12.3	mg/l		
35	RW-1121							6/4	Well Sample	6/4/2013 17:52	EPA 300.0	Nitrate-Nitrogen	15.6	mg/l		
36	RW-1122							6/4	Well Sample	6/4/2013 18:10	EPA 300.0	Nitrate-Nitrogen	26.9	mg/l		
37	RW-1124							6/4	Well Sample	6/4/2013 17:34	EPA 300.0	Nitrate-Nitrogen	18.6	mg/l		
38	RW-1125							5/28	Well Sample	5/28/2013 16:05	EPA 300.0	Nitrate-Nitrogen	10.5	mg/l		
39	RW-1126							6/4	Well Sample		EPA 300.0	Nitrate-Nitrogen	13.7	mg/l		Shares well w/ RW-1127
40	RW-1127							6/4	Well Sample	6/4/2013 17:06	EPA 300.0	Nitrate-Nitrogen	13.7	mg/l		1128
41	RW-1128							6/4	Well Sample		EPA 300.0	Nitrate-Nitrogen	13.7	mg/l		Shares well w/ RW-1127
42	RW-1129							9/18	Well Sample	9/18/2013 13:20	EPA 300.0	Nitrate-Nitrogen	28.5	mg/l		Sampled 9/18; (not home; left card - 1st visit 6/5; 2nd visit 6/19)
43	RW-1139							6/5	Well Sample	6/5/2013 17:19	EPA 300.0	Nitrate-Nitrogen	30.6	mg/l		
44	RW-1140							6/5	Well Sample		EPA 300.0	Nitrate-Nitrogen	30.6	mg/l		Shares well w/ RW-1139
45	RW-1141							6/6	Well Sample	6/6/2013 11:16	EPA 300.0	Nitrate-Nitrogen	30.2	mg/l		
46	RW-1142							6/6	Well Sample	6/6/2013 14:08	EPA 300.0	Nitrate-Nitrogen	18.5	mg/l		
47	RW-1143							6/6	Well Sample		EPA 300.0	Nitrate-Nitrogen	18.5	mg/l		Shares well w/ RW-1142
48	RW-1145							6/5	Well Sample	6/5/2013 17:56	EPA 300.0	Nitrate-Nitrogen	27.3	mg/l		
49	RW-1149							5/29	Well Sample	5/29/2013 11:50	EPA 300.0	Nitrate-Nitrogen	13.2	mg/l		RO system present @ kitchen sink

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CONTAINS PERSONALLY IDENTIFIABLE INFORMATION

Table 7
Drinking Water Sampling Results Greater Than MCL
Residential Well Sampling
Yakima Valley Dairies

SDWA-10-2013-0080

	Sample No.	Number	Street	Owner/Occupant Last Name	Owner/Occupant First Name	Latitude (DD)	Longitude (DD)	Visit Date (2013)	Type	Sampled	Analytical Method	Analyte	Result	Units	Qualifier	Notes
50	RW-1152	[redacted]						5/29	Well Sample	5/29/2013 16:00	EPA 300.0	Nitrate-Nitrogen	15.8	mg/l		
51	RW-1158							5/29	Well Sample	5/29/2013 10:08	EPA 300.0	Nitrate-Nitrogen	29.4	mg/l		RO system present @ kitchen sink
52	RW-1159							6/3	Well Sample	6/3/2013 10:31	EPA 300.0	Nitrate-Nitrogen	12	mg/l		
53	RW-1171							5/30	Well Sample	5/30/2013 15:00	EPA 300.0	Nitrate-Nitrogen	12.7	mg/l		
54	RW-1203							6/19	Well Sample	6/19/2013 18:52	EPA 300.0	Nitrate-Nitrogen	17.9	mg/l		
55	RW-1204							6/10	Well Sample	6/10/2013 18:40	EPA 300.0	Nitrate-Nitrogen	13.1	mg/l		
56	RW-1212							6/10	Well Sample	6/10/2013 16:00	EPA 300.0	Nitrate-Nitrogen	12.5	mg/l		Shares well w/ RW-1212A
57	RW-1212A							9/18	Well Sample	9/18/2013 12:28	EPA 300.0	Nitrate-Nitrogen	15.1	mg/l		6/10)
58	RW-1214							6/9	Well Sample	6/9/2013 18:12	EPA 300.0	Nitrate-Nitrogen	12.7	mg/l		
59	RW-1218							6/10	Well Sample	6/10/2013 17:55	EPA 300.0	Nitrate-Nitrogen	26.6	mg/l		
60	RW-1219							6/10	Well Sample	6/10/2013 18:10	EPA 300.0	Nitrate-Nitrogen	31.1	mg/l		
61	RW-1221							6/9	Well Sample	6/9/2013 19:28	EPA 300.0	Nitrate-Nitrogen	13	mg/l		Shares well w/ RW-1222 & RW-1223
62	RW-1222							6/9	Well Sample		EPA 300.0	Nitrate-Nitrogen	13	mg/l		Shares well w/ RW-1221
63	RW-1227							9/18	Well Sample	9/18/2013 14:05	EPA 300.0	Nitrate-Nitrogen	51.6	mg/l		Sampled 9/18; (not home; left card - 1st visit 6/10; 2nd visit 6/19)
64	RW-1230							6/10	Well Sample	6/10/2013 11:19	EPA 300.0	Nitrate-Nitrogen	25.9	mg/l		Owner did not give name
65	RW-1237							6/9	Well Sample	6/9/2013 19:00	EPA 300.0	Nitrate-Nitrogen	35.7	mg/l		
66	RW-1238							6/9	Well Sample	6/9/2013 19:44	EPA 300.0	Nitrate-Nitrogen	13.8	mg/l		

NOTES

DD - Decimal Degrees
mg/l - milligrams per liter
RO - Reverse Osmosis

CONFIDENTIAL
CONTAINS PERSONALLY IDENTIFIABLE INFORMATION

Table 8
Reverse Osmosis System Installation
Residential Well Sampling
Yakima Valley Dairies

SDWA-10-2013-0080

	Sample No.	Number	Street	City	State	Zipcode	Property Owner Last Name	Property Owner First Name	Occupant Last Name	Occupant First Name	Mailing Address	City	State	Zipcode
1	RW-1008	[redacted]												
2	RW-1011													
3	RW-1014													
4	RW-1017													
5	RW-1041													
6	RW-1042													
7	RW-1045													
8	RW-1047													
9	RW-1051													
10	RW-1054													
11	RW-1055													
12	RW-1055A													
13	RW-1068													
14	RW-1075													
15	RW-1078													
16	RW-1082													
17	RW-1083													
18	RW-1086													
19	RW-1089													
20	RW-1090A													
21	RW-1090B													
22	RW-1095													
23	RW-1096													
24	RW-1097													
25	RW-1098													
26	RW-1099													
27	RW-1100													
28	RW-1101													
29	RW-1102													
30	RW-1103													
31	RW-1107													
32	RW-1108													
33	RW-1109													
34	RW-1112													
35	RW-1114													
36	RW-1121													
37	RW-1122													
38	RW-1124													

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CONTAINS PERSONALLY IDENTIFIABLE INFORMATION

Table 8
Reverse Osmosis System Installation
Residential Well Sampling
Yakima Valley Dairies

	Sample No.	Number	Street	Phone No.	Visit Date	Nitrate Sample Result (mg/l)	Notes	Response to Offer	RO Installed
1	RW-1008	[redacted]			6/3/2013	20		Refused 12/11/13	
2	RW-1011				5/30/2013	30.6	Originally RW-1012, inadvertently switched	Accepted 8/7/2013	10/7/2013
3	RW-1014				6/3/2013	50.9		No Response	
4	RW-1017				6/3/2013	15.9		No Response	
5	RW-1041				6/3/2013	36.8		Accepted 7/10/2013	10/11/2013
6	RW-1042				6/4/2013	39.3	[redacted]	Accepted 10/9/2013	10/25/2013
7	RW-1045				5/28/2013	15.3		No Response	
8	RW-1047				5/28/2013	10.2		Accepted 7/3/2013	10/18/2013
9	RW-1051				5/28/2013	17.1		No Response	
10	RW-1054				5/28/2013	10.2		Accepted 6/26/2013	9/24/2013
11	RW-1055				5/28/2013	10	Shares well w/ RW-1054	Accepted 6/26/2013	9/24/2013
12	RW-1055A				5/28/2013	10	Shares well w/RW-1054 & RW-1055	Accepted 6/26/2013	9/24/2013
13	RW-1068				6/5/2013	30.7		Accepted 6/24/3013	9/27/2013
14	RW-1075				6/4/2013	11.3		Accepted 6/26/3013	10/11/2013
15	RW-1078				5/29/2013	12.4	RO system present	No Response	
16	RW-1082				6/6/2013	36.5	Shares well w/ RW-1083	No Response	
17	RW-1083				6/6/2013	36.5		No Response	
18	RW-1086				5/30/2013	16.8		No Response	
19	RW-1089				5/30/2013	16.8	Shares well w/ RW-1086	No Response	
20	RW-1090A				5/30/2013	23.8	2 wells/2 samples;	Accepted 8/7/2013	10/1/2013
21	RW-1090B				5/30/2013	23	RW-1090A & RW-1090B	Accepted 8/7/2013	10/1/2013
22	RW-1095				5/29/2013	11.8		Accepted 7/16/2013	12/6/2013
23	RW-1096				5/29/2013	16		Accepted 7/3/2013	9/26/2013
24	RW-1097				5/30/2013	10.1		Accepted 6/25/2013	9/20/2013
25	RW-1098				5/30/2013	10.1	Shares well w/ RW-1097	Accepted 6/24/2013	9/27/2013
26	RW-1099				5/29/2013	14		No Response	
27	RW-1100				5/29/2013	10.9		No Response	
28	RW-1101				5/29/2013	18.2	RO system present	Accepted 8/7/2013	10/7/2013
29	RW-1102				5/30/2013	18.2		Accepted 7/1/2013	9/25/2013
30	RW-1103				5/29/2013	12.3		No Response	
31	RW-1107				5/29/2013	10.4		No Response	
32	RW-1108				5/29/2013	20.3		Accepted 7/9/2013	9/19/2013
33	RW-1109				5/29/2013	20.3	Shares well w/ RW-1108	Accepted 10/18/2013	11/8/2013
34	RW-1112				6/19/2013	18.1		Accepted 7/8/2013	10/14/2013
35	RW-1114				6/19/2013	12.3		No Response	
36	RW-1121				6/4/2013	15.6		No Response	
37	RW-1122				6/4/2013	26.9		Accepted 6/24/2013	9/20/2013
38	RW-1124				6/4/2013	18.6		No Response	

CONFIDENTIAL
CONTAINS PERSONALLY IDENTIFIABLE INFORMATION

Table 8
Reverse Osmosis System Installation
Residential Well Sampling
Yakima Valley Dairies

SDWA-10-2013-0080

	Sample No.	Number	Street	City	State	Zipcode	Property Owner Last Name	Property Owner First Name	Occupant Last Name	Occupant First Name	Mailing Address	City	State	Zipcode
39	RW-1125	[redacted]												
40	RW-1126													
41	RW-1127													
42	RW-1128													
43	RW-1129													
44	RW-1139													
45	RW-1140													
46	RW-1141													
47	RW-1142													
48	RW-1143													
49	RW-1145													
50	RW-1149													
51	RW-1152													
52	RW-1158													
53	RW-1159													
54	RW-1171													
55	RW-1203													
56	RW-1204													
57	RW-1212													
58	RW-1212A													
59	RW-1214													
60	RW-1218													
61	RW-1219													
62	RW-1221													
63	RW-1222													
64	RW-1227													
65	RW-1230													
66	RW-1237													
67	RW-1238													

NOTES

DD - Decimal Degrees
mg/l - milligrams per liter
RO - Reverse Osmosis

CONFIDENTIAL
CONTAINS PERSONALLY IDENTIFIABLE INFORMATION

Table 8
Reverse Osmosis System Installation
Residential Well Sampling
Yakima Valley Dairies

	Sample No.	Number	Street	Phone No.	Visit Date	Nitrate Sample Result (mg/l)	Notes	Response to Offer	RO Installed
39	RW-1125	[redacted]			5/28/2013	10.5		Accepted 7/10/2013	9/27/2013
40	RW-1126				6/4/2013	13.7	Shares well w/ RW-1127	Accepted 6/28/2013	9/18/2013
41	RW-1127				6/4/2013	13.7	Shares well w/ RW-1126	Accepted 6/24/2013	10/7/2013
42	RW-1128				6/4/2013	13.7	RO system present	Accepted 6/25/2013	10/7/2013
43	RW-1129				9/18/2013	28.5		Accepted 9/24/2013	10/25/2013
44	RW-1139				6/5/2013	30.6	Shares well w/RW-1140	Accepted 6/25/2013	No Response to Pinnacle
45	RW-1140				6/5/2013	30.6	Shares well w/ RW-1139	Accepted 6/24/2013	No Response to Pinnacle
46	RW-1141				6/6/2013	30.2		No Response	
47	RW-1142				6/6/2013	18.5	Shares well w/RW-1143	No Response	
48	RW-1143				6/6/2013	18.5	Shares well w/ RW-1142	No Response	
49	RW-1145				6/5/2013	27.3		No Response	
50	RW-1149				5/29/2013	13.2	RO system present; Shares well w/ RW-1097		
51	RW-1152				5/29/2013	15.8		Accepted 7/8/2013	10/1/2013
52	RW-1158					29.4	RO system present	Accepted 6/27/13	9/25/2013
53	RW-1159				6/3/2013	12		Accepted 6/23/2013	9/19/2013
54	RW-1171				5/30/2013	12.7		No Response	
55	RW-1203				6/19/2013	17.9	[redacted]	Accepted 8/11/2013	9/17/2013
56	RW-1204				6/10/2013	13.1		No Response	
57	RW-1212				6/10/2013	12.5	Shares well w/ RW-1212A	Accepted 6/22/2013	9/19/2013
58	RW-1212A				9/18/2013	15.1		Accepted 9/24/2013	10/11/2013
59	RW-1214				6/9/2013	12.7		No Response	
60	RW-1218				6/10/2013	26.6		Accepted 6/27/2013	9/25/2013
61	RW-1219				6/10/2013	31.1		No Response	
62	RW-1221				6/9/2013	13	Shares well w/ RW-1222 & RW-1223	No Response	
63	RW-1222				6/9/2013	13	Shares well w/ RW-1221	No Response	
64	RW-1227				9/18/2013	51.6	Verbal w/owner/occupant	Accepted 9/18/2013	10/25/2013
65	RW-1230				6/10/2013	25.9	Did not give name	No Response	
66	RW-1237				6/9/2013	35.7		No Response	
67	RW-1238				6/9/2013	13.8		No Response	

NOTES

DD - Decimal Degrees
mg/l - milligrams per liter
RO - Reverse Osmosis

CONFIDENTIAL
CONTAINS PERSONALLY IDENTIFIABLE INFORMATION

Table 9
Existing Reverse Osmosis System Maintenance
Residential Well Sampling
Yakima Valley Dairies

SDWA-10-2013-0080

	Sample No.	Number	Street	City	State	Zipcode	Property Owner Last Name	Property Owner First Name	Occupant Last Name	Occupant First Name	Mailing Address	City	State	Zipcode
1	RW-1002	[redacted]												
2	RW-1003													
3	RW-1004													
4	RW-1005													
5	RW-1006													
6	RW-1007													
7	RW-1010													
8	RW-1013													
9	RW-1015													
10	RW-1019													
11	RW-1021													
12	RW-1022													
13	RW-1028													
14	RW-1029													
15	RW-1034													
16	RW-1036													
17	RW-1040													
18	RW-1065													
19	RW-1066													
20	RW-1069													
21	RW-1078													
22	RW-1080													
23	RW-1081													
24	RW-1101													
25	RW-1113													
26	RW-1120													
27	RW-1123													
28	RW-1128													
29	RW-1133													
30	RW-1136													
31	RW-1138													
32	RW-1146													
33	RW-1149													
34	RW-1150													
35	RW-1151													
36	RW-1158													
37	RW-1162													
38	RW-1164													

CONFIDENTIAL
CONTAINS PERSONALLY IDENTIFIABLE INFORMATION

Table 9
Existing Reverse Osmosis System Maintenance
Residential Well Sampling
Yakima Valley Dairies

SDWA-10-2013-0080

	Sample No.	Number	Street	Phone No.	Visit Date	Notes	Response to Offer	Maintenance Performed
1	RW-1002	[redacted]			6/10/2013	RO system present	No Response	
2	RW-1003				6/2/2013	RO system present	No Response	
3	RW-1004				6/10/2013	RO system present	No Response	
4	RW-1005				6/2/2013	RO system present	No Response	
5	RW-1006				6/10/2013	RO system present	No Response	
6	RW-1007				6/19/2013	RO system present; Previously listed as RW-1205	Accepted 6/25/2013	10/7/2013
7	RW-1010				6/3/2013	RO system present	Accepted 7/15/2013	9/26/2013
8	RW-1013				6/3/2013	RO system present	No Response	
9	RW-1015				6/2/2013	RO system present	Accepted 7/16/2013	10/18/2013
10	RW-1019				6/2/2013	RO system present	No Response	
11	RW-1021				6/3/2013	RO system present	No Response	
12	RW-1022				6/19/2013	RO system present	Uncooperative occupant	
13	RW-1028				6/3/2013	RO system present	No Response	
14	RW-1029				6/18/2013	RO system present	No Response	
15	RW-1034				6/3/2013	RO system present	No Response	
16	RW-1036				6/3/2013	RO system present	No Response	
17	RW-1040				6/4/2013	RO system present; Shares well w/ RW-1042	Accepted 7/1/2013	10/1/2013
18	RW-1065				6/3/2013	RO system present	Accepted 7/1/2013	9/26/2013
19	RW-1066				5/29/2013	RO system present	Accepted 6/25/13	12/13/2013
20	RW-1069				6/19/2013	RO system present	No Response	
21	RW-1078				5/29/2013	RO system present	No Response	
22	RW-1080				5/30/2013	RO system present	No Response	
23	RW-1081				6/20/2013	RO system present	No Response	
24	RW-1101				5/29/2013	RO system present	No Response	
25	RW-1113				6/6/2013	RO system present	No Response	
26	RW-1120				6/4/2013	RO system present	No Response	
27	RW-1123				6/4/2013	RO system present	No Response	
28	RW-1128				6/4/2013	RO system present	Accepted 6/28/2013	9/18/2013
29	RW-1133				6/20/2013	RO system present	Accepted 7/16/2013	11/8/2013
30	RW-1136				6/5/2013	RO system present	No Response	
31	RW-1138				6/5/2013	RO system present	No Response	
32	RW-1146				6/5/2013	RO system present	No Response	
33	RW-1149				5/29/2013	RO system present	Accepted 6/24/2013	9/18/2013
34	RW-1150				5/30/2013	RO system present	No Response	
35	RW-1151				6/6/2013	RO system present	No Response	
36	RW-1158				5/29/2013	RO system present	Accepted 6/27/2013	9/25/2013
37	RW-1162				6/20/2013	RO system present	Accepted 6/25/2013	10/1/2013
38	RW-1164				6/5/2013	RO system present	No Response	

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CONTAINS PERSONALLY IDENTIFIABLE INFORMATION

Table 9
Existing Reverse Osmosis System Maintenance
Residential Well Sampling
Yakima Valley Dairies

SDWA-10-2013-0080

	Sample No.	Number	Street	City	State	Zipcode	Property Owner Last Name	Property Owner First Name	Occupant Last Name	Occupant First Name	Mailing Address	City	State	Zipcode
39	RW-1166	[redacted]												
40	RW-1170													
41	RW-1173													
42	RW-1174													
43	RW-1176													
44	RW-1201													
45	RW-1207													
46	RW-1217													
47	RW-1220													
48	RW-1223													
49	RW-1231													
50	RW-1239													

NOTES

DD - Decimal Degrees
mg/l - milligrams per liter
RO - Reverse Osmosis

CONFIDENTIAL
CONTAINS PERSONALLY IDENTIFIABLE INFORMATION

Table 9
Existing Reverse Osmosis System Maintenance
Residential Well Sampling
Yakima Valley Dairies

	Sample No.	Number	Street	Phone No.	Visit Date	Notes	Response to Offer	Maintenance Performed
39	RW-1166	[redacted]			6/20/2013	RO system present	No Response	
40	RW-1170				6/6/2013	RO system present	No Response	
41	RW-1173				5/30/2013	RO system present	No Response	
42	RW-1174				5/30/2013	RO system present	Accepted 6/25/2013	9/20/2013
43	RW-1176				6/6/2013	RO system present	No Response	
44	RW-1201				6/19/2013	RO system present	Accepted 9/11/2013	10/9/2013
45	RW-1207				6/10/2013	RO system present	No Response	
46	RW-1217				6/10/2013	RO system present	No Response	
47	RW-1220				6/10/2013	RO system present	No Response	
48	RW-1223				6/9/2013	RO system present; Shares well w/ RW-1221	Accepted 7/1/2013	10/12/2013
49	RW-1231				6/19/2013	RO system present	Accepted 9/11/2013	10/9/2013
50	RW-1239				6/10/2013	RO system present	No Response	

NOTES

DD - Decimal Degrees
mg/l - milligrams per liter
RO - Reverse Osmosis

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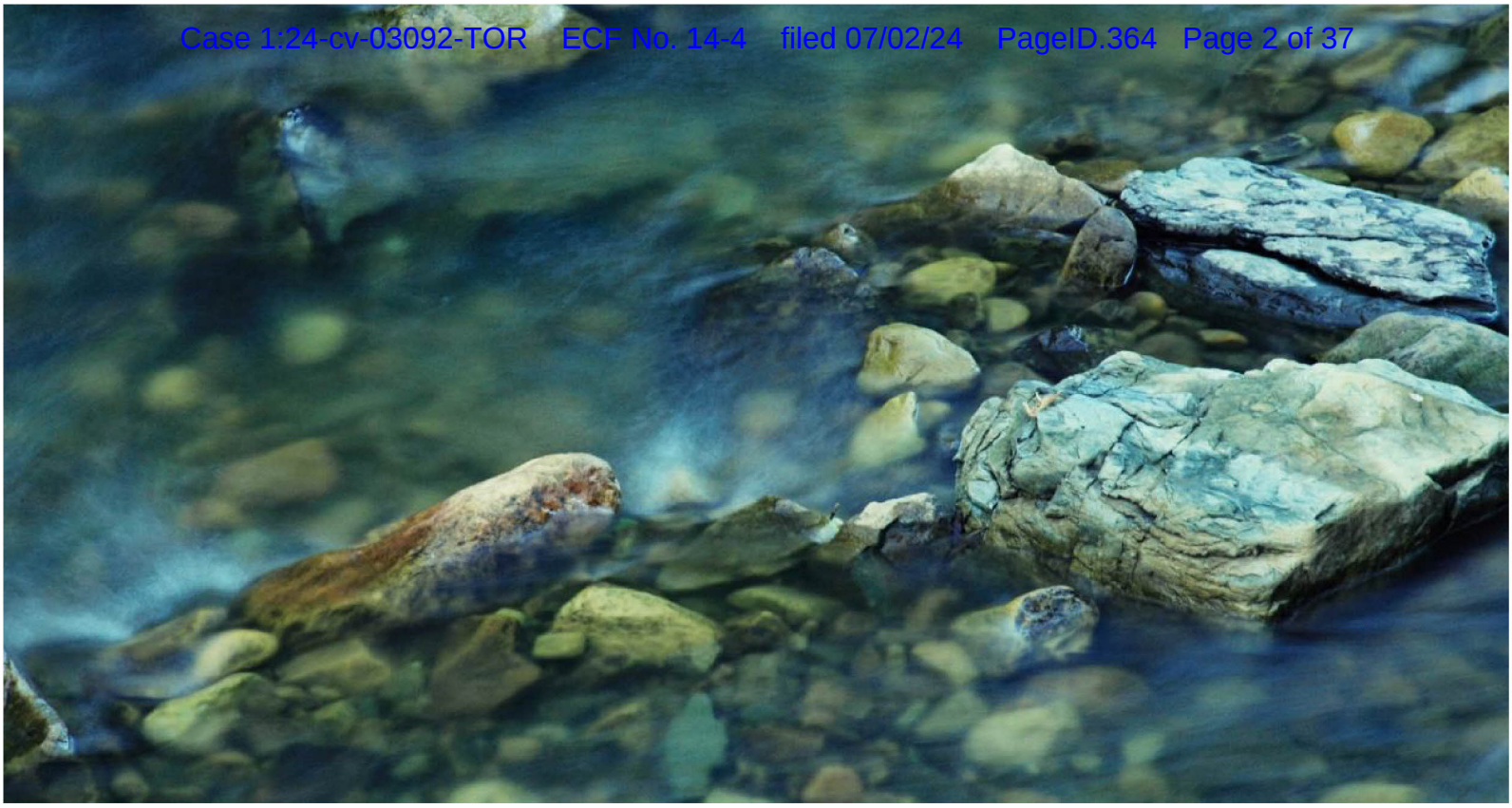
Table 10
Not-At-Home and Refusal Residences
Residential Well Sampling
Yakima Valley Dairies

SDWA-10-2013-0080

	Sample No.	Number	Street	Owner/Occupant Last Name	Owner/Occupant First Name	Visit Date	Notes
1	RW-1001	[redacted]				6/2/2013	Vacant lot; [redacted]
2	RW-1009					6/19/2013	Not home; left card (2nd attempt; first visit 6/3)
3	RW-1016					6/2/2013	Vacant
4	RW-1023					6/3/2013	Vacant; left card
5	RW-1038					6/18/2013	Not home; left card (2nd attempt; first visit 6/4)
6	RW-1052					6/5/2013	Vacant; left card
7	RW-1057					6/18/2013	Not home; left card (2nd attempt; first visit 6/4)
8	RW-1058					6/19/2013	Not home; left card (2nd attempt; first visit 6/4)
9	RW-1059					6/19/2013	Not home; left card (2nd attempt; first visit 6/4)
10	RW-1061					6/6/2013	Refusal; Do not sample
11	RW-1077					6/19/2013	Not home; left card (2nd attempt; first visit 6/4)
12	RW-1079					5/30/2013	Vacant; [redacted] left card; [redacted]
13	RW-1088					6/19/2013	Not home; left card (2nd attempt; first visit 5/30)
14	RW-1104					6/20/2013	Not home; left card (2nd attempt; first visit 5/29)
15	RW-1106					5/29/2013	Vacant
16	RW-1117					6/19/2013	Not home; left card (2nd attempt; first visit 6/4)
17	RW-1135					6/19/2013	Refusal
18	RW-1137					6/19/2013	Not home; left card (2nd attempt; first visit 6/5)
19	RW-1144					6/3/2013	Vacant; left card
20	RW-1147					6/5/2013	Vacant; left card
21	RW-1148					6/19/2013	Not home; left card [redacted] 2nd attempt; first visit 6/6)
22	RW-1155					6/19/2013	Refusal
23	RW-1156					6/19/2013	Not home; left card (2nd attempt; first visit 6/5)
24	RW-1157					6/19/2013	Not home; left card (2nd attempt; first visit 6/5)
25	RW-1167					6/20/2013	Not home; left card (2nd attempt; first visit 6/6)
26	RW-1168					6/20/2013	Not home; left card (2nd attempt; first visit 6/6)
27	RW-1175					6/20/2013	Not home; left card (2nd attempt; first visit 6/3)
28	RW-1180					6/4/2013	Refusal; [redacted]; left card [redacted]
29	RW-1202					6/10/2013	No home present
30	RW-1206					6/10/2013	Parcel does not exist
31	RW-1215					6/10/2013	No home present
32	RW-1225					6/9/2013	No home present
33	RW-1229					6/20/2013	Not home; left card (2nd attempt; first visit 6/10)
34	RW-1232					6/19/2013	Not home; left card (2nd attempt; first visit 6/10)
35	RW-1233					6/10/2013	No home present
36	RW-1234					6/19/2013	Not home; left card (2nd attempt; first visit 6/10)

Eric Winiecki Declaration
Exhibit D



March 2018
SDWA-10-2013-0080/Yakima Valley Dairies

ANCHOR QEA

Groundwater Monitoring Quality Assurance Project Plan

Prepared for Cow Palace, LLC
George DeRuyter & Son Dairy, LLC/D&A Dairy, LLC/George & Margaret, LLC
Liberty Dairy, LLC/H&S Bosma Dairy

March 2018
SDWA-10-2013-0080/Yakima Valley Dairies

Groundwater Monitoring Quality Assurance Project Plan

Prepared for
Cow Palace, LLC
George DeRuyter & Son Dairy, LLC/
D&A Dairy, LLC/George & Margaret, LLC
Liberty Dairy, LLC/H&S Bosma Dairy

Prepared by
Anchor QEA, LLC
1119 Pacific Avenue, Suite 1600
Tacoma, Washington 98042

Project Number: 180996-02.01
\\FUJI\Anchor\Projects\Yakima Dairies\SDWA AOC\Deliverables\07 - Groundwater\GW QAPP Update 2-2018\Groundwater Monitoring QAPP_03-01-2018.docx

SIGNATURE PAGE

EPA Docket No. SDWA-10-2013-0080

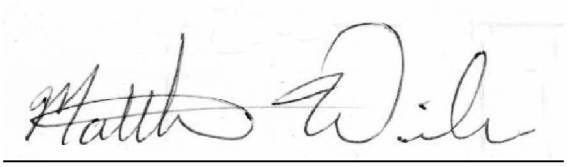
Groundwater Monitoring Quality Assurance Project Plan

Date: February 23, 2018

Mark Larsen
Project Coordinator, Anchor QEA, LLC

Date: February 23, 2018

Cindy Fields
Project Chemist/Quality Assurance Manager, Anchor QEA, LLC



Date: February 23, 2018

Matt Wilson, R.G.
Field Team Leader, Anchor QEA, LLC

TABLE OF CONTENTS

1 Project Management 1
1.1 Project/Task Organization 1
1.2 Problem Definition/Background 2
1.2.1 Purpose 2
1.2.2 Problem Statement 2
1.2.3 Conceptual Site Model 2
1.3 Project/Task Description and Schedule 3
1.3.1 Project/Task Description 3
1.3.2 Project Schedule 4
1.4 Quality Objectives and Criteria 5
1.4.1 Project Quality Objectives 5
1.4.2 Measurement Performance Criteria 5
1.5 Special Training/Certification 6
1.6 Documents and Records 6

2 Data Generation and Acquisition 7
2.1 Sampling Design 7
2.1.1 Groundwater Monitoring Well Installation and Development 7
2.1.2 Groundwater Well Sampling 7
2.1.3 Groundwater Level Monitoring 7
2.2 Groundwater Sampling Methods 8
2.2.1 Sample Collection 8
2.2.2 Sampling Equipment Decontamination 8
2.3 Sample Handling and Custody 9
2.3.1 Sample Labeling Methodology 9
2.3.2 Sample Chain of Custody 10
2.3.3 Field Sampling Data Sheets 11
2.4 Analytical Methods 11
2.5 Quality Control 12
2.5.1 Field Quality Control Samples 12
2.5.2 Laboratory Quality Control Procedures 12
2.6 Instrument/Equipment Testing, Inspection, and Maintenance 12
2.7 Laboratory Instrument/Equipment Calibration and Frequency 13
2.8 Field Instrument/Equipment Calibration and Frequency 13

2.9 Inspection/Acceptance of Supplies and Consumables 13
2.10 Non-Direct Measurements 13
2.11 Data Management 13

3 Assessment and Oversight 15
3.1 Assessments and Response Actions 15
3.2 Reports to Management 15
3.2.1 Groundwater Monitoring Well Installation Report 15
3.2.2 Groundwater Monitoring Data Reports 16
3.2.3 Analytical Data Reporting 17

4 Data Validation and Usability 18
4.1 Data Review, Verification, and Validation 18
4.2 Verification and Validation 18
4.2.1 Validation 18
4.3 Reconciliation with User Requirements 18

5 References 19

6 Certifications 20
6.1 Cow Palace Certification 20
6.2 George DeRuyter & Son Dairy, LLC, D&A Dairy, LLC, and George & Margaret, LLC, Certification 21
6.3 Liberty Dairy Certification 22

TABLES

Table 1 Monitoring Well Construction Details
Table 2 Groundwater Monitoring Frequency
Table 3 Data Needs
Table 4 Analytes, Methods, Holding Times, and Preservation
Table 5 Analyte Specifications for Field Parameters

FIGURES

Figure 1 Project Organization
Figure 2 Conceptual Site Model
Figure 3 Conceptual Site Model Flow Chart
Figure 4 Site Map

Figure 5 Aerial Photograph

APPENDICES

Appendix A Groundwater Monitoring Well Installation Work Plan
Appendix B Data Quality Objectives
Appendix C Lab Certifications
Appendix D Field Forms
Appendix E Low-Flow Groundwater Purging and Sampling Standard Operating Procedure
Appendix F Field Equipment Decontamination Standard Operating Procedure
Appendix G Chain of Custody, Handling, Packing, and Shipping Standard Operating Procedure
Appendix H YSI Professional Plus User Manual
Appendix I EPA Deliverable Guidance Documents

ABBREVIATIONS

AOC	Administrative Order on Consent
ARCADIS	ARCADIS U.S., Inc.
CSM	conceptual site model
Dairies	1) Cow Palace, LLC; 2) D&A Dairy, LLC (also known as D and A Dairy L.L.C.), George DeRuyter & Son Dairy, LLC, and George & Margaret, LLC; and 3) Liberty Dairy, LLC, and its associated dairy facility H&S Bosma Dairy
DQO	data quality objective
EPA	U.S. Environmental Protection Agency
FSDS	Field Sampling Data Sheet
FTL	field team leader
HASP	Health and Safety Plan
IES	Inland Earth Sciences Corporation
LHG	licensed hydrogeologist
PC	project coordinator
QAM	quality assurance manager
QAPP	Quality Assurance Project Plan
QC	quality control
SOP	standard operating procedure
SOW	Statement of Work

DISTRIBUTION LIST

Adam Dolsen	Cow Palace, LLC
Dan DeRuyter	George DeRuyter & Son Dairy, LLC
	D&A Dairy, LLC
	George & Margaret, LLC
Henry Bosma	Liberty Dairy, LLC
	H&S Bosma Dairy
Eric Winiecki	U.S. Environmental Protection Agency, Region 10
Rene Fuentes	U.S. Environmental Protection Agency, Region 10
Jennifer MacDonald	U.S. Environmental Protection Agency, Region 10
Patrick Ryan	Perkins Coie LLP
Brendan Monahan	Stokes Lawrence PS
Lori Terri Gregory	Foster Pepper PLLC
Mark Larsen	Anchor QEA, LLC

1 Project Management

1.1 Project/Task Organization

This section presents the necessary organizational structure and lines of communication to implement monitoring well installation and groundwater monitoring activities presented in this Groundwater Monitoring Quality Assurance Project Plan (QAPP).

This QAPP was originally developed on behalf of: 1) Cow Palace, LLC; 2) D&A Dairy, LLC (also known as D and A Dairy, L.L.C.), George DeRuyter & Son Dairy, LLC, and George & Margaret, LLC; and 3) Liberty Dairy, LLC, and its associated dairy facility H&S Bosma Dairy (collectively referred to as the Dairies) in June 2013 by ARCADIS U.S., Inc. (ARCADIS). The QAPP was developed in accordance with requirements identified in Section III.E of the Statement of Work (SOW) (Appendix B of Administrative Order on Consent (AOC) SDWA-10-2013-0080). The QAPP was prepared in accordance with *Guidance for Quality Assurance Project Plans (QA/G-5)* (EPA 2002) and *EPA Requirements for Quality Assurance Project Plans, (EPA QA/R-5)* (EPA 2001). In addition to this guidance, data quality objectives (DQOs) were developed using the requirements included in the AOC SOW and in accordance with the *Guidance on Systematic Planning Using the Data Quality Objectives Process (QA/G-4)* (EPA 2006).

The Dairies retained Inland Earth Sciences Corporation (IES) to revise and implement the QAPP. IES revised the QAPP in August 2015. An addendum to the QAPP was prepared by Anchor QEA, LLC, in 2016 (Anchor QEA 2016) and approved by the U.S. Environmental Protection Agency (EPA) in January 2017. The current document integrates prior QAPP versions as amended by subsequent discussions with EPA regarding the needs of the groundwater monitoring program.

The project organization and lines of authority and communication are illustrated schematically on Figure 1.

The Project Coordinator (PC) will be responsible for implementing the activities identified in the QAPP and maintaining communication with the EPA PC to report progress and resolve issues that may arise while implementing the QAPP, if necessary. The PC has overall authority over the project team and QAPP implementation.

The project chemist/quality assurance manager (QAM) will help to develop and review project planning documents, evaluate data, and prepare deliverables.

A certified drinking water analytical laboratory will analyze the groundwater samples.

The field team leader (FTL)/site safety coordinator will be responsible for sample collection and implementation of the QAPP and Health and Safety Plan (HASP). A geologist licensed in the

State of Washington or working under the direct supervision of a licensed geologist will lead any monitoring well installation activities.

The PC and project chemist/QAM will develop appropriate corrective actions to address any potential quality assurance issues or deficiencies that may occur. Corrective actions will be communicated to the EPA PC and implemented and documented by the FTL or laboratory as required.

1.2 Problem Definition/Background

1.2.1 Purpose

This QAPP defines and describes the processes and methods to perform groundwater monitoring well installation and groundwater monitoring required under Section III.E of the AOC SOW. This QAPP was developed to document the type, quantity, and quality of data needed to meet project objectives and support key decisions. This QAPP also describes the methods for collecting and assessing data collected to implement the QAPP.

1.2.2 Problem Statement

Pursuant to Section III.E of the AOC SOW, the objectives of this QAPP are to establish a baseline of groundwater quality information at the Dairies to evaluate whether actions taken to reduce nitrogen loading are effective over time and collect information to supplement and verify existing information on the environmental setting at the Dairies, including further clarification of the hydraulic gradient of the aquifer beneath the Dairies.

1.2.3 Conceptual Site Model

A conceptual site model (CSM) for the Dairies was developed in accordance with the guidance document *Environmental Cleanup Best Management Practices, Effective Use of the Project Life Cycle Conceptual Model* (EPA 2011). The CSM is presented in Figure 2, and a CSM flow chart is presented in Figure 3. The CSM provides a graphic description of how nitrogen from various potential dairy facility sources may reach groundwater and eventually drinking water wells as nitrate. Potential nitrogen sources from the dairy facilities include animal waste lagoons, animal waste management or storage ponds, and irrigated cropland. With respect to irrigated crop fields, the potential nitrogen sources include solid manure, liquid manure, and synthetic fertilizers applied to the surface soils. Different forms of nitrogen typically migrate through unsaturated subsurface soil and enter the shallow alluvial aquifer. Nitrogen forms are converted to nitrate via nitrification through chemical and biological processes. Groundwater containing nitrate could be pumped from the shallow aquifer to drinking water wells for human consumption.

1.3 Project/Task Description and Schedule

1.3.1 Project/Task Description

The scope of this QAPP encompasses groundwater monitoring well installation, quarterly groundwater sampling, and laboratory analysis of groundwater samples, and it includes a provision to collect information to supplement and verify existing information on the environmental setting at the Dairies. Information collected in accordance with this QAPP will be reported in the Groundwater Monitoring Well Installation Report and the Groundwater Monitoring Data Reports.

Specific activities included in this QAPP are listed as follows:

- **Monitoring Well Installation**
  - A total of 27 monitoring wells have been drilled and installed at locations in the vicinity of the Dairies by EPA, or by the Dairies in accordance with the AOC. Of these, 24 wells were completed in the shallow water-bearing zone of the surficial aquifer, and three wells were completed at deeper depths. One well, YVD-14, was inadvertently destroyed, and had to be decommissioned and replaced with YVD-14R. Table 1 and Figures 3 and 4 document the well construction details and locations of the wells that were installed by EPA, or by the Diaries in accordance with AOC. Any future monitoring wells added to the existing well network will be drilled, installed, and developed as described in the *Groundwater Monitoring Well Installation Work Plan* (Appendix A).
  - Lithologic information from any new well boreholes will be collected to supplement and verify existing information on the environmental setting.
  - Well screens in the aforementioned monitoring wells were completed in the shallow portion of the surficial aquifer across the water table as determined at the time of monitoring well installation (e.g., 15 feet of screen below the water table and 5 feet of screen above the water table). The top of the screen in monitoring wells completed in the deeper portion of the surficial aquifer were installed approximately 45 feet below the water table at the time of installation. Any additional monitoring wells installed in the future will follow the same basic well design.
  - Development of monitoring wells will be completed in accordance with the method presented in the *Monitoring Well Development Guidelines for Superfund Project Managers* (EPA 1992).
  - Monitoring well locations and elevations will be surveyed by a State of Washington-licensed professional land surveyor. Wells will be surveyed and existing well elevations will be converted to the National Geodetic Vertical Datum of 1929 or updated to the North American Vertical Datum of 1988 to an accuracy within 0.01 foot. Horizontal surveying accuracy will be within 1.0 foot using the Washington State Coordinate System.

  - Following any well installation activities, a Groundwater Monitoring Well Installation Report will be prepared that will include lithologic logs and well construction details.
- **Groundwater Monitoring**
  - Quarterly measurement of groundwater elevations of all 26 wells in the monitoring program (nine EPA wells and 17 AOC wells) will occur. The locations of the monitoring wells are shown in Figures 4 and 5; well construction details are presented in Table 1.
  - Quarterly and annual groundwater sampling for the analytes presented in Section 2.4 will take place at a certified drinking water analytical laboratory. Refer to Table 2 for a list of the groundwater sampling frequencies for individual wells.
  - Continuous groundwater elevation monitoring with pressure transducers at six monitoring wells within the boundary of the Dairies will measure fluctuations in the water table and provide additional information regarding hydraulic gradient. Two of the pressure transducers will be installed in a shallow/deep well pair to evaluate changes in head between the shallow and deep zones.

1.3.2 Project Schedule

Task	Start Date	Completion Date
Groundwater Monitoring QAPP	Upon the effective date of the AOC	May 20, 2013 (60 days after the effective date of the AOC)
Drill, install, and develop monitoring wells	Upon EPA approval of the Groundwater Monitoring QAPP	45 days after approval of the QAPP
Install pressure transducers	Within 5 days of completing monitoring well installation and development	5 days after completing monitoring well installation and development activities
Survey wells	Within 5 days of completing monitoring well installation and development	10 days after completing monitoring well installation and development activities
Initial groundwater sampling	Within 5 days of completing monitoring well installation and development	30 days after completing well installation and development activities
Submit Groundwater Monitoring Well Installation Report	Upon completing field activities	60 days after completing monitoring well installation and development activities
Perform quarterly groundwater sampling	Approximately 3 months after the prior sampling event	Approximately 3 months after the prior sampling event
Submit validated groundwater nitrate analytical results	In parallel with submittal of quarterly report	In parallel with submittal of quarterly report
Submit Quarterly Groundwater Monitoring Data Reports	--	60 days after each quarterly monitoring event for at least the first year (with later adjustment at EPA discretion)

Task	Start Date	Completion Date
Submit Annual Groundwater Monitoring Data Reports	--	March 1 of each year after the effective date beginning in 2014 (as part of the Annual Report described in Section III.K.2 of the AOC SOW)

Note:
--: not applicable

1.4 Quality Objectives and Criteria

1.4.1 Project Quality Objectives

Project-specific DQOs were identified through the DQO process (EPA 2006) to meet the data user's needs for each activity. The specific data needs for the groundwater monitoring primarily focus on nitrate concentrations in groundwater that may be used for drinking water purposes. The DQO decision-making process for the groundwater monitoring is described in Appendix B.

The data needs for the groundwater monitoring are summarized in Table 3. This table lists the specific analytes, regulatory limits and measurement criteria, and data uses. The different criteria evaluated to develop the data needs are described in the DQO decision-making process (Appendix B).

1.4.2 Measurement Performance Criteria

Measurement performance criteria are often expressed in terms of data quality indicators. The principal indicators of data quality are precision, accuracy, representativeness, comparability, and completeness. The following are definitions to assess data quality indicators summarized from *Guidance for Quality Assurance Project Plans (EPA QA/G-5)* (EPA 2002):

1. **Precision** is the measure of agreement among repeated measurements of the same property under identical or substantially similar conditions.
2. **Accuracy** is a measure of the overall agreement of a measurement to a known value. It includes a combination of random-error (precision) and systematic-error (bias) components of both sampling and analytical operations.
3. **Representativeness** is a qualitative term that expresses the degree to which data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition.
4. **Comparability** is a qualitative term that expresses the measure of confidence that one dataset can be compared to another and can be combined for a decision to be made.
5. **Completeness** is a measure of the amount of valid data needed to be obtained from a measurement system.

Precision, accuracy, and completeness criteria are shown in Table 4.

1.5 Special Training/Certification

All personnel working on the project site will be trained in health and safety in accordance with the HASP. All personnel will comply with the requirements included in the HASP regarding site-specific hazards and conditions. Training requirements, documentation, and tracking are included in the HASP.

Section III.A.3.a of the AOC SOW requires laboratories analyzing drinking and non-drinking water samples to be accredited by the State of Washington, the National Environmental Laboratory Accreditation Program, or an equivalent as determined by EPA. As per Section VII Paragraph 13a of the AOC, the analytical laboratory's certification will be provided to EPA prior to use of the lab for analytical testing. The analytical laboratory will comply with the requirements for analytical laboratories described in Section III.A.3.a of the AOC SOW. Laboratory certification is included in Appendix C.

1.6 Documents and Records

All field activities will be documented in appropriate field forms included in Appendix D. Field documentation may include, but is not limited to, the following:

- Task Sheet
- Water Level Survey
- Transducer Download and Calibration Form
- Daily Safety Briefing Form
- Field Sampling Data Sheet
- Calibration Log
- Chain-of-Custody Form
- Soil Boring Log
- Well Details Form
- Well Development Form

All field team-generated documentation will be compiled and submitted to the FTL and PC for distribution, inclusion in the project records, and use in subsequent reporting.

Laboratory documentation will be provided in accordance with the methods and protocols discussed in Section 4 of this QAPP. Laboratory analytical data will be distributed to the PC. The PC will distribute the data to EPA, project team members, and others as required.

2 Data Generation and Acquisition

Considering the primary objective of the project (as detailed in Section 1.2.2), a field activity and sampling strategy has been designed to ensure that all information, sample collection, analytical data, and resulting decisions are technically sound, scientifically valid, and properly administered.

2.1 Sampling Design

The objectives of the project will be accomplished by installing groundwater monitoring wells and sampling groundwater from the surficial aquifer. Monitoring wells will be completed in both the shallow and deep portions of the surficial aquifer.

2.1.1 Groundwater Monitoring Well Installation and Development

The procedures for drilling and developing the monitoring wells are presented in the *Groundwater Monitoring Well Installation Work Plan* (Appendix A).

2.1.2 Groundwater Well Sampling

Groundwater samples will be collected from newly installed groundwater monitoring wells and previously installed EPA monitoring wells. Groundwater monitoring wells included in groundwater sampling efforts are shown in Figures 4 and 5 and summarized in Tables 1 and 2.

Section III.3.b of the AOC SOW requires groundwater samples to be analyzed for nitrate, nitrite, ammonia, phosphorus, total Kjeldahl nitrogen, select inorganic anions and metals, and alkalinity. Section 2.2 presents a description of the sampling methodology employed to collect samples.

Laboratory analytical results will be used to establish baseline groundwater quality at the Dairies. Quarterly results from subsequent sampling events will be used to evaluate nitrate concentrations in groundwater over time to evaluate the effectiveness of nitrogen source actions taken as part of the AOC SOW.

2.1.3 Groundwater Level Monitoring

Long-term continuous groundwater elevations will be monitored using pressure transducers in six monitoring wells to evaluate seasonal fluctuations and trends in groundwater elevations. Two pressure transducers will be installed in one of the shallow/deep monitoring well pairs to evaluate differences in head between the shallow and deep portions of the surficial aquifer. The remaining transducers will be placed in monitoring wells located within the dairy facilities to evaluate groundwater gradients. A list of the wells with transducers for long-term groundwater elevation monitoring is presented in Table 2. Transducers will be suspended in the well screen intervals below the water table to the extent that water level fluctuations do not expose the transducers to air. The

transducers will also be appropriately rated for the respective anticipated head in each well. Transducers will be secured within the steel surface casing to prevent vandalism or tampering.

Recorded data will be downloaded from transducers quarterly. During the quarterly downloads, water levels in wells will be manually gauged using a water level meter.

2.2 Groundwater Sampling Methods

This section presents the sampling methodology for collecting laboratory analytical samples from groundwater monitoring wells. Groundwater monitoring well sampling activities will be conducted by field teams comprising two field staff.

2.2.1 Sample Collection

Groundwater samples will be collected from the newly installed and developed monitoring wells and previously installed EPA wells summarized in Table 1 and presented in Figures 3 and 4. Groundwater sampling frequencies for individual wells are summarized in Table 2. Nitrate concentration values for groundwater from the wells designated for annual sampling have been below the 10-milligram-per-liter maximum contaminant level for nitrate for eight consecutive quarters. If nitrate values above the maximum contaminant level for any of the annual wells are confirmed, that well will be returned to a quarterly sampling frequency. The wells on the annual frequency will be sampled in the second quarter of each year. Groundwater samples will be collected using low-flow sample collection procedures described in the standard operating procedure (SOP) entitled "Low-Flow Groundwater Purging and Sampling" (Appendix E). Low-flow sample collection is a method that minimizes the impact of the purging process on groundwater chemistry and results in a smaller volume of purge water.

The low-flow sample collection method requires water quality indicator parameters and water levels to be measured during purging and prior to collecting samples. Stabilized water quality indicator parameters and monitored water levels are a prerequisite to collecting samples. The water quality indicator parameters to be measured include dissolved oxygen, oxidation-reduction potential, pH, specific conductance, temperature, and turbidity. Sample container types, the number of containers, holding times, and preservation for required analytes are specified in Table 4. Analyte specifications for field parameters and stabilization criteria are presented in Table 5.

2.2.2 Sampling Equipment Decontamination

Groundwater monitoring equipment that comes into contact with sample media will be decontaminated following the procedures presented in the SOP entitled "Field Equipment Decontamination" (Appendix F). Equipment blank samples will be collected once per sampling day from non-dedicated sampling equipment only and submitted to the laboratory for analysis to ensure proper equipment decontamination procedures have been implemented.

Equipment blanks will be collected only if sampling equipment requiring decontamination is used for collecting samples. If only dedicated equipment is used to collect samples, no equipment blanks will be collected.

2.3 Sample Handling and Custody

This section describes sample management and documentation to ensure that samples maintain their original condition during collection, transportation, storage, and analysis. All sample control and chain-of-custody procedures will follow the SOP entitled "Chain of Custody, Handling, Packing, and Shipping" (Appendix G), except where noted.

2.3.1 Sample Labeling Methodology

All samples collected for laboratory analysis, including normal samples, field duplicates, field blanks, and equipment blanks, will be assigned a unique blind code sample identification number. The blind code will include the prefix YVD; a six-digit number indicating the month, date, and year; and a sequential two-digit suffix starting with the number -01. For example, the first sample collected on December 5, 2018, will be given the blind code YVD-120518-01. Suffixes will be numbered sequentially continuously throughout the sampling event (i.e., they will not start over at "-01" on each day of sampling).

Equipment blanks will be collected only if sampling equipment requiring decontamination is used for collecting samples. If only dedicated equipment is used to collect samples, no equipment blanks will be collected.

Field duplicate samples will be collected at a frequency of one in every 10 samples or at a minimum of one per sampling day. Field blanks will be collected daily.

Each sample collected in the field will be labeled for future identification. Sample labels will be filled out as completely as possible by a member of the sampling team prior to the start of the day's field sampling activities. The date, time, and sample identification number should not be completed until the sample is actually collected. All sample labels will be filled out using waterproof ink. Each label will contain the following information at a minimum:

- Sampler's initials
- Sampler's company affiliation
- Site location
- Sample identification number
- Date and time of sample collection
- Analyses required

2.3.2 *Sample Chain of Custody*

Sample designation, sampling time and date, sampling personnel, and analyses will also be recorded on the field records, sample labels, and chain-of-custody records. The purpose of the chain of custody is to ensure the possession of samples is traceable from the time the samples are collected until they are analyzed. A sample is considered to be in custody when the following occurs:

- It is in the possession of the sampler, transporter, or laboratory.
- It is in view of the sampler, transporter, or laboratory after being in their possession.
- It was in the possession of the sampler, transporter, or laboratory and was then secured by them.
- It is in a designated secure area that has restricted access.

To ensure proper sample control in the field, it is important that as few people as possible handle the samples. The field sampler is the primary person responsible for the care and custody of samples until they are transferred or shipped. The PC and FTL will determine if proper custody procedures have been followed during field activities and, if deficiencies are found, determine if additional sample collection is warranted.

All samples will be accompanied by a chain-of-custody record. When sample custody is transferred, the individuals relinquishing and receiving the samples will sign and date the chain-of-custody record. The chain-of-custody record documents custody transfer from the sampler, often through another agent (shipping/transport company), to the laboratory sample custodian.

Samples will be packaged properly prior to shipping, and a chain-of-custody record will accompany each shipping container. All shipping containers will be sealed with custody seals for shipment/transport to the laboratory, unless the sample coolers are hand-delivered to the laboratory. Hand-delivered coolers will be transported without custody seals only if they remain in the controlled possession of the sampler at all times; if a cooler is outside of the sampler's possession, then a custody seal will be affixed.

Custody seals will be placed in a manner that will indicate if the container had been opened during shipment. Courier names and other pertinent information will be documented on the chain-of-custody record. All shipments will be accompanied by the chain-of-custody record that identifies the contents of the shipment. The original will be included in the shipment; an additional copy will be retained by the sampler and provided to the PC. All shipping documentation (e.g., freight bills) will be retained as part of the chain-of-custody documentation by the PC.

Because of the 48-hour holding time for nitrate analysis by EPA Method 300.0, samples will be shipped using an overnight delivery service each day (Monday through Thursday) or delivered by the field personnel or a courier to the laboratory each sampling day. The analytical laboratory will

analyze the samples immediately upon receipt or prioritize for the next available analytical run to ensure holding time compliance.

Once at the laboratory, the sample custodian will accept custody of the samples and enter information about the shipment into a sample receipt log that will include the initials of the person receiving the package, the cooler temperature, and the status of custody seals on the containers. The sample custodian will log in the samples following the laboratory's SOP. The unused portions of all samples after analysis will be disposed of by the laboratory in accordance with their SOP.

2.3.3 Field Sampling Data Sheets

In addition to the chain-of-custody documentation described in Section 2.3.2., Field Sampling Data Sheets (FSDSs) will be completed to document daily activities and observations. FSDSs will be completed for each groundwater and quality assurance sample collected and will include sample identification, sample collection time, sample bottles used, analysis requested, groundwater quality parameter readings, and other pertinent information, including significant events and observations that occur during sampling activities.

Sufficient information will be noted on the FSDSs to enable participants to reconstruct events that occurred and to refresh the memory of field personnel, if needed. Original copies of field forms and chain-of-custody documents will be retained by the PC in the project files.

2.4 Analytical Methods

Groundwater samples will be analyzed for the following analytes and methods:

- Nitrate (as nitrogen) by EPA Method 300.0
- Nitrite (as nitrogen) by EPA Method 300.0
- Inorganic anions (chloride, fluoride, and sulfate) by EPA Method 300.0
- Alkalinity (total and bicarbonate) by Standard Method 2320B
- Ammonia (as nitrogen) by EPA Method 350.1 or Standard Method 4500-NH3 G (methods are equivalent)
- Total phosphorus by EPA Method 365.1 or Standard Method 4500-P E (methods are equivalent)
- Total Kjeldahl nitrogen by EPA Method 351.2 or Standard Method 4500-Norg C using colorimetric detection (methods are equivalent)
- Metals (calcium, potassium, magnesium, and sodium) by EPA Method 200.7

Table 4 presents the analytes, method, container, preservation method, and holding times for the groundwater samples collected during groundwater monitoring.

2.5 Quality Control

This section presents the field and laboratory quality control (QC) requirements for groundwater monitoring.

2.5.1 Field Quality Control Samples

Groundwater monitoring includes collecting field QC samples including field duplicates, field blanks, and equipment blanks The field duplicate sample will be collected concurrently with the normal sample using the same collection procedures. Field duplicate samples will be collected at a frequency of one in every 10 samples or at a minimum of one per sampling day. The date and time the field duplicate is sampled will be recorded on the FSDS and chain-of-custody record correctly. No attempts at a "blind" sample (e.g., marking all field duplicates as being collected as 12:00 p.m.) will be attempted. A field blank QC sample will be prepared by the sampling team at the beginning of each sampling day by filling a sample bottle with laboratory-supplied deionized water. The field blank will remain in the sample container throughout the day. Field blanks will be prepared for each sample container and sent to the laboratory for analysis. Equipment blanks will be collected at a frequency of one per sampling day to evaluate possible cross-contamination only if non-dedicated equipment requiring decontamination is used for and comes in contact with sample media. The equipment blank is generated with water used to decontaminate sampling equipment at the first location of the day and will be collected and analyzed by the laboratory for all target analytes to ensure that target analytes are not present above the reporting limits.

2.5.2 Laboratory Quality Control Procedures

Laboratory QC procedures include the following:

- Instrument calibration and standards as defined in the specified analytical methods
- Laboratory blank measurements at a minimum of 5% or a one-per-batch frequency
- Accuracy and precision measurements at a minimum of one in 20 or one per set
- Data reduction and reporting according to the specified analytical methods
- Laboratory documentation according to the specified analytical methods and laboratory SOP requirements

2.6 Instrument/Equipment Testing, Inspection, and Maintenance

Instrument maintenance logbooks will be maintained in the laboratory at all times and include a schedule of maintenance and a complete history of past maintenance for equipment used to analyze groundwater monitoring samples.

2.7 Laboratory Instrument/Equipment Calibration and Frequency

The analytical laboratory will follow all calibration procedures and frequencies specified in the analytical methods listed in Section 2.4. The calibration requirements for each method and respective corrective actions will be accessible, either in the laboratory SOPs or in the laboratory's Quality Assurance Manual for each instrument or analytical method in use. All calibrations will be preserved on electronic media.

2.8 Field Instrument/Equipment Calibration and Frequency

A YSI Professional Plus multiparameter water quality meter (or similar instrument) and a Hanna turbidimeter (or similar instrument) will be used to collect groundwater quality parameter measurements including pH, specific conductance, temperature, dissolved oxygen, oxidation-reduction potential, and turbidity during well purging. The field instruments will be calibrated daily or as recommended by the manufacturer using the manual calibration procedures specified in the SOP (Appendix H). Daily calibration values will be recorded on a Calibration Log.

2.9 Inspection/Acceptance of Supplies and Consumables

Supplies and consumables will be inspected upon receipt. All sample bottles used for collecting laboratory analysis samples will be new, certified clean, and provided by the laboratory. Field sampling team members will make note of the information on the certificate of analysis that accompanies sample containers to ensure that they meet the specifications and guidance for contaminant-free sample containers. Any discrepancies will be brought to the attention of the FTL immediately.

2.10 Non-Direct Measurements

Other than the data generated by EPA's sample collection in January 2013 from the monitoring wells included in this QAPP, no pre-existing data will be used to make decisions to support the groundwater monitoring. All data used to support decision-making will be collected during the groundwater monitoring.

2.11 Data Management

All field data collected during the groundwater monitoring will be recorded on field forms. Pertinent information will be transferred to an Excel spreadsheet or similar electronic data management tool. The analytical data obtained from the laboratory will be maintained in an electronic database. All data will undergo review and validation as described in Section 4.

The data provided to EPA will be in accordance with the procedures presented in *EPA Region 10 Monitoring and Analytical Data Deliverables Data Submission Process for Water Quality Exchange (WQX) Compatible Deliverables for Yakima Dairies (Docket No. SDWA-10-2013-0080)* and

EPA Region 10 Geographic Information System Data Deliverable Guidance for Yakima Dairies (Docket No. SDWA-10- 2013-0080). These documents are presented in Appendix I. Data submitted to EPA will be provided in the requested format and consistent with the examples provided by EPA. An example of the required file format was provided in EPA file "R10WQXEDD.zip."

3 Assessment and Oversight

3.1 Assessments and Response Actions

The PC and project chemist/QAM will monitor the performance of the quality assurance procedures presented in this QAPP. The PC has the ultimate responsibility for implementing this QAPP. If problems arise, or if directed by the PC, the project chemist/QAM will conduct a field audit to evaluate compliance with the guidance presented in this QAPP.

Laboratory analysis of samples collected during groundwater monitoring will be conducted by a certified drinking water laboratory. The laboratory will comply with the methods listed in Section 2.3 of this QAPP and laboratory SOPs for sample analyses, QC, and instrument testing, inspection, maintenance, and calibration. If deficiencies are noted, the laboratory will notify the project chemist/QAM. If such cases occur, the PC will notify the EPA PC, and corrective action procedures will be implemented.

3.2 Reports to Management

3.2.1 Groundwater Monitoring Well Installation Report

Pending installation of any additional monitoring wells under the AOC, a Groundwater Monitoring Well Installation Report will be prepared and will include, at a minimum, the following information for all groundwater monitoring wells used to meet the project objectives described in Section II of the AOC SOW:

- A description (in the form of a table) and map showing all well locations, including each well's surveyed surface reference point, vertical reference point elevation, well depth, and screened interval; the table providing these data will reference the datum used for all measurements
- A base map identifying monitoring well locations in reference to the potential source areas present; base maps prepared from aerial photographs will reference the source of the photograph, date, north arrow, scale, altitude, name, photograph number or identification code, photo provider, camera calibration, and other pertinent information; image maps will be based on orthorectified or geo-registered imagery
- Site maps showing the locations of major features such as structures (e.g., buildings, tanks, lagoons, irrigated fields, fertilized fields, manure piles, or unlined corrals), natural features, monitoring wells, other sampling locations, major surface topography characteristics, spill areas, discharge points (e.g., pipes, culverts, or weirs), roads (including names), and property and fence lines; site maps will also include the base map reference, date of latest revision, project name and number, site location, north arrow, scale, and legend with the appropriate information depicted on the map

- Well logs including boring and casing diameter and total depth of each well and a description of the well screen interval including screen slot type, size, and length, depth of screen, filter pack materials, and method of filter pack emplacement
- Documentation of methods used to seal each well from the surface to prevent infiltration of water into the well and downward migration of contaminants through the well annulus
- A description of well development methods and procedures, including volume purged and parameter measurements
- Documentation that all boring, well installation, and well abandonment procedures comply with all applicable federal, state, and local laws and were conducted by a driller licensed in the State of Washington
- A Groundwater Monitoring Well Installation Report submitted within 60 days after completing monitoring well installation and development activities

3.2.2 Groundwater Monitoring Data Reports

Quarterly and Annual Groundwater Monitoring Data Reports will be prepared following quarterly sampling events and annually starting in 2014, respectively. The Groundwater Monitoring Data Reports will present the findings of the groundwater monitoring work at the Dairies. Reports will include, but are not limited to, the following components:

- Each Quarterly Groundwater Monitoring Data Report will present, in tabular format, the field parameters and validated data with qualifiers, if applied, and a complete analytical data package for constituents monitored in groundwater for each quarterly groundwater monitoring event. Each quarterly report will include figures that depict, at a minimum, water level elevations and gradient and constituent concentrations.
- The second Quarterly Groundwater Monitoring Data Report will include all of the information, interpretation, and cumulative data presentations and be formatted to be representative of an Annual Groundwater Monitoring Data Report. Quarterly Groundwater Monitoring Data Reports will be submitted to EPA after each quarterly data collection effort as required in Section III.A.e of the AOC SOW.
- Each Annual Groundwater Monitoring Data Report will include the same information contained in the Quarterly Groundwater Monitoring Data Reports and a cumulative presentation of all data collected to date.
- Each Annual Groundwater Monitoring Data Report will contain a chart for each sample parameter at each well (e.g., time-concentration plots). The charts will include all historical data collected from each well.
- Each Annual Groundwater Monitoring Data Report will be submitted as part of the Annual Report described in Section III.K.2 of the AOC SOW.

3.2.3 *Analytical Data Reporting*

The analytical laboratory will submit sufficient laboratory documentation such that sample results are traceable to the field samples and the analytical data can be verified and validated by an independent third-party review. Preliminary and validated data reports will be provided by the laboratory to the PC. The PC and project chemist/QAM will review the data reports from the laboratory and evaluate the data validation and usability as described in Section 4. Validated data, the validation report, and associated raw data will be submitted to EPA as part of data reporting.

The following information will either be supplied by the laboratory as a hard copy deliverable to support project activities, data validation, and the documentation of data quality or maintained at the laboratory and available on request:

Data Deliverables or Information Maintained at the Laboratory
Case narrative, including a discussion of nonconformance and corrective actions
Sample data and QC data summary forms
Chain-of-custody records, sample receipt forms, logbook pages, shipping manifests
Verification of sample temperature on receipt
Copies of temperature logs for storage coolers used to store samples
Certificate of cleanliness for all laboratory-supplied sample bottles
Internal chain of custody
Copies of SOPs
Sample and standard preparation logs
Instrument operating conditions
Copies of sample analysis logbooks and analyst's notes
Instrument run log including copies of autosampler loading and verification of autosampler loading
Raw data for instrument—hardcopy or electronic for field, calibration, and QC samples
Data review sheets
Example calculations
Control charts for method blanks, replicates, matrix spikes, matrix spike duplicates, laboratory control samples, and surrogates
Pertinent method detection limit studies and supporting information
Standards, standards reference materials, balance weights, and thermometer certificates
Verification of autopipettes and volumetric glassware
Balance calibration logs
Equipment maintenance records
Consumables acceptance and tracking records
Analyst's demonstration of precision and accuracy

The validated data, the data validation report, and the associated laboratory data will be submitted to EPA in accordance with the AOC SOW.

4 Data Validation and Usability

4.1 Data Review, Verification, and Validation

Data verification will be conducted by the laboratory prior to submitting to the PC. Data review, validation, and verification performed by the laboratory will comply with EPA requirements and laboratory SOPs for the EPA methods specified in Section 2.4 of this QAPP.

4.2 Verification and Validation

Prior to submitting the analytical samples to the laboratory, the sampling team leader or a designate will review the field notes and chain of custody for accuracy and completeness. The notes will be reviewed for appropriate documentation of the field work-pertinent activities, including verifying complete residential information. The chain of custody will be reviewed for appropriate sample nomenclature and selected analysis.

The analytical data generated shall be reduced, verified, and reported by the laboratory according to the methods listed in Section 2.4. Data verification will be performed by the laboratory for all analyses prior to releasing the data to IES. The laboratory will archive the analytical data in their own laboratory data management system. The project chemist will also validate laboratory data upon receipt.

4.2.1 Validation

The project chemist will validate laboratory data upon receipt. The chemist will perform an EPA Stage 2A (EPA 2009) validation consistent with the most current National Functional Guidelines (EPA 2017) for metals. For all other analytes validation will be performed in accordance with analytical methods or SOPs.

4.3 Reconciliation with User Requirements

Analytical data results obtained during the groundwater monitoring will be reconciled with precision, accuracy, and completeness criteria shown in Table 4.

5 References

EPA (U.S. Environmental Protection Agency), 1992. *Monitoring Well Development Guidelines for Superfund Project Managers*. Ground Water Forum. April 1992.

EPA, 2001. *EPA Requirements for Quality Assurance Project Plans (EPA QA/R-5)*. EPA-240-B-01-1003. Office of Environmental Information, Washington, D.C. March 2001 (reissued May 2006).

EPA, 2002. *Guidance for Quality Assurance Project Plans (EPA QA/G-5)*. EPA-240-R-02-009. Office of Environmental Information, Washington, D.C. December 2002.

EPA, 2006. *Guidance on Systematic Planning Using Data Quality Objectives Processes (EPA QA/G-4)*. EPA 240-B-06-001. Office of Environmental Information, Washington D.C. February 2006

EPA, 2009. *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use*. EPA-540-R-08-005. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. January 2009.

EPA, 2011. *Environmental Cleanup Best Management Practices, Effective Use of the Project Life Cycle Conceptual Model*. EPA 542-F-11-011. Office of Solid Waste and Emergency Response. July 2011.

EPA, 2013. Administrative Order on Consent (AOC) Docket No. SDWA-10-2013-0080. March 19, 2013.

EPA, 2017. *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Methods Data Review*. EPA-540-R-2017-001. U.S. Environmental Protection Agency, Office of Superfund Remediation and Technology Innovation. January 2017.

Puls, R.W. and M.J. Barcelona, 1996. *Groundwater Issue Paper: Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures*. EPA-540-S-95-504. U.S. Environmental Protection Agency. 12 pp. 1996.

Wild, F.D., D.B. Radtke, J. Gibs, and R.T. Iwatsubo, (eds.), 1998. *National Field Manual for the Collection of Water-Quality Data*. U.S. Geological Survey Techniques of Water-Resources Investigations. Variously paginated. 1998.

6 Certifications

6.1 Cow Palace Certification

I certify under the penalty of law that this document and all attachments were prepared by me or under my direction or supervision in accordance with a system designed to assure that qualified personnel gathered and evaluated the information submitted. Based on my inquiry of any and all persons directly responsible for gathering and analyzing the information obtained, I certify that the information contained in or accompanying this submittal is to the best of my knowledge and belief, true, accurate and complete. As to those identified portion(s) of this submittal for which I cannot personally verify the accuracy, I certify that this submittal and all attachments were prepared in accordance with procedures designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those directly responsible for gathering the information, or the immediate supervisor of such person(s), the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

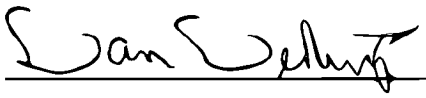
Cow Palace, LLC

Signature	
Name	Adam Dolsen
Title	Member
Date	3-8-18

6.2 George DeRuyter & Son Dairy, LLC, D&A Dairy, LLC, and George & Margaret, LLC, Certification

I certify under the penalty of law that this document and all attachments were prepared by me or under my direction or supervision in accordance with a system designed to assure that qualified personnel gathered and evaluated the information submitted. Based on my inquiry of any and all persons directly responsible for gathering and analyzing the information obtained, I certify that the information contained in or accompanying this submittal is to the best of my knowledge and belief, true, accurate and complete. As to those identified portion(s) of this submittal for which I cannot personally verify the accuracy, I certify that this submittal and all attachments were prepared in accordance with procedures designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those directly responsible for gathering the information, or the immediate supervisor of such person(s), the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

George DeRuyter & Son Dairy, LLC, D&A Dairy, LLC (also known as D and A Dairy L.L.C.), and George & Margaret, LLC

Signature	
Name	Dan DeRuyter
Title	Member
Date	3/6/18

6.3 Liberty Dairy Certification

I certify under the penalty of law that this document and all attachments were prepared by me or under my direction or supervision in accordance with a system designed to assure that qualified personnel gathered and evaluated the information submitted. Based on my inquiry of any and all persons directly responsible for gathering and analyzing the information obtained, I certify that the information contained in or accompanying this submittal is to the best of my knowledge and belief, true, accurate and complete. As to those identified portion(s) of this submittal for which I cannot personally verify the accuracy, I certify that this submittal and all attachments were prepared in accordance with procedures designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those directly responsible for gathering the information, or the immediate supervisor of such person(s), the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Liberty Dairy, LLC, and its associated dairy facility H&S Bosma Dairy

Signature	Henry W Bosma
Name	Henry Bosma
Title	Partner
Date	3-8-18

Tables

Table 1
Monitoring Well Construction Details

Well ID	Coordinates		Top of Casing Elevation (feet NAVD88)	Ground Surface Elevation (feet NAVD88)	Surface Completion	Well Depth (feet bgs)	Casing and Screen Material	Screen Slot Size (inches)	Screen Length (feet)	Depth to Top of Screen (feet bgs)	Depth to Bottom of Screen (feet bgs)	Elevation of Top of Screen (feet NAVD88)	Elevation of Base of Screen (feet NAVD88)	Depth to Top of Filter Pack (feet bgs)	Depth to Bottom of Filter Pack (feet bgs)
	Latitude	Longitude													
Monitoring Wells															
DC-01	46.418795	-120.138185	1199.17	1199.64	Flush	160.0	Schedule 40 PVC	0.020	20.0	140.0	160.0	1059.6	1039.6	136.0	160.0
DC-03	46.386289	-120.146145	910.58	911.04	Flush	85.0	Schedule 40 PVC	0.020	20.0	62.5	82.5	848.5	828.5	58.5	85.0
DC-03D	46.386220	-120.146054	911.33	908.83	Stick-up	116.1	Schedule 40 PVC	0.020	9.5	106.1	115.6	802.7	793.2	100.0	116.5
DC-04	46.382446	-120.131129	877.22	877.62	Flush	51.0	Schedule 40 PVC	0.020	20.0	29.5	49.5	848.1	828.1	24.5	51.0
DC-05	46.382358	-120.120237	911.95	912.35	Flush	86.0	Schedule 40 PVC	0.020	20.0	63.5	83.5	848.9	828.9	59.5	86.0
DC-05D	46.382517	-120.120210	915.91	913.55	Stick-up	126.8	Schedule 40 PVC	0.020	9.5	116.8	126.3	796.8	787.3	114.0	128.0
DC-07	46.389612	-120.141671	889.29	889.78	Flush	61.0	Schedule 40 PVC	0.020	20.0	38.5	58.5	851.3	831.3	34.5	61.0
DC-09	46.404230	-120.120858	1048.60	1048.97	Flush	196.0	Schedule 40 PVC	0.020	20.0	173.5	193.5	875.5	855.5	169.5	196.0
DC-14	46.404240	-120.139685	1036.61	1036.92	Flush	151.0	Schedule 40 PVC	0.020	20.0	128.5	148.5	908.4	888.4	124.5	151.0
YVD-02	46.422601	-120.113697	1288.97	1285.81	Stick-up	35.0	Schedule 40 PVC	0.020	19.5	15.0	34.5	1270.8	1251.3	13.0	36.0
YVD-03	46.414227	-120.139638	1120.68	1118.15	Stick-up	200.1	Schedule 40 PVC	0.020	19.5	180.1	199.6	938.1	918.6	176.0	202.0
YVD-04	46.408062	-120.156224	1118.66	1116.06	Stick-up	245.2	Schedule 40 PVC	0.020	19.5	225.2	244.7	890.9	871.4	220.0	248.0
YVD-05	46.404457	-120.142790	1051.78	1052.26	Flush	182.2	Schedule 40 PVC	0.020	19.5	162.2	181.7	890.1	870.6	156.0	208.0
YVD-06	46.407671	-120.137191	1053.51	1053.88	Flush	169.0	Schedule 40 PVC	0.020	19.5	149.0	168.5	904.9	885.4	144.0	170.0
YVD-07	46.404432	-120.125205	1073.03	1070.59	Stick-up	168.3	Schedule 40 PVC	0.020	19.5	148.3	167.8	922.3	902.8	145.0	169.0
YVD-08	46.396920	-120.152771	1014.38	1011.92	Stick-up	182.5	Schedule 40 PVC	0.020	19.5	162.5	182.0	849.4	829.9	155.0	188.0
YVD-09	46.396832	-120.144078	966.81	964.28	Stick-up	122.3	Schedule 40 PVC	0.020	19.5	102.3	121.8	862.0	842.5	9.5	128.0
YVD-10	46.396978	-120.136165	958.00	955.45	Stick-up	103.1	Schedule 40 PVC	0.020	19.5	83.1	102.6	872.4	852.9	76.0	103.5
YVD-11	46.393446	-120.123627	967.91	965.51	Stick-up	116.9	Schedule 40 PVC	0.020	19.5	96.9	116.4	868.6	849.1	94.0	117.3
YVD-12	46.389730	-120.166996	961.91	959.51	Stick-up	151.4	Schedule 40 PVC	0.020	19.5	131.4	150.9	828.1	808.6	127.0	154.0
YVD-13	46.389708	-120.151673	965.59	963.07	Stick-up	141.0	Schedule 40 PVC	0.020	19.5	121.0	140.5	842.1	822.6	117.0	148.0
YVD-14R	46.389532	-120.145124	920.19	918.80	Stick-up	93.0	Schedule 40 PVC	0.020	20.0	72.0	92.0	846.8	826.8	69.0	93.0
YVD-15	46.389802	-120.137153	940.61	938.08	Stick-up	105.1	Schedule 40 PVC	0.020	19.5	85.1	104.6	853.0	833.5	81.0	128.0
YVD-16	46.389586	-120.114783	975.90	972.99	Stick-up	122.1	Schedule 40 PVC	0.020	19.5	102.1	121.6	870.9	851.4	100.5	127.0
YVD-17	46.380761	-120.142067	866.73	864.28	Stick-up	47.7	Schedule 40 PVC	0.020	19.5	27.7	47.2	836.6	817.1	25.0	58.0
YVD-18	46.389758	-120.151671	965.74	963.42	Stick-up	179.9	Schedule 40 PVC	0.020	9.5	169.9	179.4	793.5	784.0	166.0	181.5
Decommissioned Wells															
YVD-14	46.389536	-120.145067	920.19	917.64	Stick-up	91.0	Schedule 40 PVC	0.020	19.5	71.0	90.5	846.6	827.1	66.0	98.0

Notes:
Latitude and longitude in decimal degrees based on World Geodetic Survey 1984.
bgs: below ground surface
NAVD88: North American Vertical Datum of 1988
PVC: polyvinyl chloride

Table 2
Groundwater Monitoring Frequency

Well ID	Manual Groundwater Elevation Measurements (Quarterly)	Long-Term Groundwater Elevation Measurements (Continuous)	Groundwater Sampling Frequency	
			Quarterly	Annually (Second Quarter Event)
DC-01	X			X
DC-03	X	X	X	X
DC-03D	X		X	X
DC-04	X		X	X
DC-05	X	X	X	X
DC-05D	X	X	X	X
DC-07	X			X
DC-09	X			X
DC-14	X		X	X
YVD-02	X			X
YVD-03	X	X		X
YVD-04	X			X
YVD-05	X			X
YVD-06	X			X
YVD-07	X			X
YVD-08	X	X	X	X
YVD-09	X		X	X
YVD-10	X		X	X
YVD-11	X	X	X	X
YVD-12	X		X	X
YVD-13	X		X	X
YVD-14R	X		X	X
YVD-15	X		X	X
YVD-16	X		X	X
YVD-17	X			X
YVD-18	X		X	X

Table 3
Data Needs

Analyte	Units	Lowest Potential Regulatory Level/ Measurement Criteria	Data Use
Field Measurements			
Depth to water	feet	--	Groundwater purging criteria
Dissolved oxygen	mg/L	± 0.3 mg/L	Groundwater purging criteria
Oxidation-reduction potential	mV	± 10 mV	Groundwater purging criteria
pH	standard units	± 0.1 pH units	Groundwater purging criteria
Specific conductance	mmhos/cm	± 3% mmhos/cm	Groundwater purging criteria
Temperature	Celsius	--	Groundwater purging criteria
Turbidity	NTU	± 10% NTUs (when turbidity is greater than 10 NTUs)	Groundwater purging criteria
Laboratory Measurements			
Nitrate (as nitrogen)	mg/L	10	Support decision for groundwater monitoring
Nitrite (as nitrogen)	mg/L	1	Support decision for groundwater monitoring
Ammonia	mg/L	--	Support decision for groundwater monitoring
Total phosphorus	mg/L	--	Support decision for groundwater monitoring
Total Kjeldahl nitrogen	mg/L	--	Support decision for groundwater monitoring
Chloride	mg/L	250[a]	Support decision for groundwater monitoring
Fluoride	mg/L	4	Support decision for groundwater monitoring
Sulfate	mg/L	250[a]	Support decision for groundwater monitoring
Calcium	mg/L	--	Support decision for groundwater monitoring
Potassium	mg/L	--	Support decision for groundwater monitoring
Magnesium	mg/L	--	Support decision for groundwater monitoring
Sodium	mg/L	--	Support decision for groundwater monitoring
Alkalinity (total and bicarbonate)	mg/L	--	Support decision for groundwater monitoring

Notes:
a. National Secondary Drinking Water Standard
-- : not applicable
mg/L: milligrams per liter
mmhos/cm: micromhos per centimeter
mV: millivolts
NTU: nephelometric turbidity units

Table 4
Analytes, Methods, Holding Times, and Preservation

Analyte	Method	Laboratory Reporting Limit (mg/L)	Container	No. of Containers	Container Designation	Hold Time	Preservation	Accuracy	Precision	Completeness
Nitrate (as nitrogen)	EPA 300.0	0.05	500 mL HDPE	1	1	48 hours	≤6 °C	80% to 120%	+/-20%	90%
Nitrite (as nitrogen)	EPA 300.0	0.05								
Chloride	EPA 300.0	0.1				28 days	≤6 °C	80% to 120%	+/-20%	90%
Fluoride	EPA 300.0	0.1								
Sulfate	EPA 300.0	0.1								
Total alkalinity	SM2320B	10				14 days	≤6 °C	80% to 120%	+/-20%	90%
Bicarbonate alkalinity	SM2320B	10								
Ammonia	SM4500-NH3 G	0.07	500 mL HDPE	1	2	28 days	pH<2 with H2SO4 ≤6 °C	80% to 120%	+/-20%	90%
Total phosphorus	SM4500-P E	0.25								
Total Kjeldahl nitrogen	SM4500-NORG C	0.3								
Calcium	EPA 200.7	0.4	500 mL HDPE	1	3	6 months	pH<2 with HNO3 ≤6 °C	80% to 120%	+/-20%	90%
Potassium	EPA 200.7	0.62								
Magnesium	EPA 200.7	0.06								
Sodium	EPA 200.7	0.7								

Notes:

EPA: U.S. Environmental Protection Agency

H2SO4: sulfuric acid

HDPE: high density polyethylene

HNO3: nitric acid

mg/L: milligram per liter

mL: milliter

SM: Standard Method

Table 5
Analyte Specifications for Field Parameters

Analyte	Units of Measurement	Stabilization Criteria	Reference
Field Measurements			
Depth to water	feet	--	--
Dissolved oxygen	mg/L	+/- 0.3 mg/L	Wilde et al. 1998
Oxidation-reduction potential	mV	+/- 10mV	Puls and Barcelona 1996
pH	pH units	+/- 0.1 pH units	Puls and Barcelona 1996; Wilde et al. 1998
Specific conductance	mmhos/cm	+/- 3% mmhos/cm	Puls and Barcelona 1996
Temperature	°C	--	--
Turbidity	NTU	+/- 10% NTUs (when turbidity is greater than 10 NTUs)	Puls and Barcelona 1996; Wilde et al. 1998

Notes:
-- : not applicable
mg/L: milligrams per liter
mmhos/cm: micromhos per centimeter
mV: millivolts
NTU: nephelometric turbidity units

Eric Winiecki Declaration
Exhibit E

Spreadsheet Placeholder(file available in native format)

File Name: Exhibit E.xlsx

Inspection Reports Summary

Year 2000 Estimate

County	AG ID	Facility	Date of Inspection or document	Milking	Dry	Heifers	Calves	Total Animals	Basis	Electronic Page	NOTES	Other Inspection Dates
Yakima	9132	Cow Palace	7/2/1999	4,969	1,289	0	1,336	7,594	Cow Palace #1 - 1631 Liberty Rd - Granger.pdf	65		2001, 2004, 2005, 2007, 2009, 2011
Yakima	9612	Liberty Dairy	9/9/1999	2,100	220	385	0	2,705	Hank Bosma - Liberty Dairy.pdf	18		2001, 2004, 2006, 2008, 2010, 2011
Yakima	9199	Henry Bosma Dairy	9/9/1999	1,400	120	400	600	2,520	Hank Bosma - Liberty Dairy.pdf	18	Addition error in inspection report… corrected here.	2001, 2006, 2008, 2010
Yakima	9701	George DeRuyter Dairy	8/11/2000	2,000	300	0	300	2,600	George DeRuyter & Sons Dairy.pdf	20		2002, 2005, 2007, 2008, 2011
Yakima	2014	D & A Farms	3/11/2002	1,050	0	1,000	0	2,050	George DeRuyter - D&A Farms.pdf	34		2007, 2008, 2011
		Totals		11,519	1,929	1,785	2,236	**17,469**				
		Avg. Date	5/2/2000									

Year 2005 Estimate

County	AG ID	Facility	Date of Inspection or document	Milking	Dry	Heifers	Calves	Total Animals	Basis	Electronic Page	
Yakima	9132	Cow Palace	11/22/2005	6700	1,000	300	2,700	10,700	CowPalace1_RT12105.pdf	2	
Yakima	9199	Henry Bosma Dairy	7/18/2006	4,050	560	1,800	1,200	7,610	HenryBosmaDairy_RT071806.pdf	3	This number is used as a combined total for H&S Bosma and Liberty. (See handwritten note at the top of HenryBosmaDairy_RT071806.pdf)
Yakima	9701	George DeRuyter Dairy	3/29/2005	2,600	300	200	1,100	4,200	GeorgeDeRuyter_RT032905.pdf	1	
Yakima	2014	D & A Farms	9/21/2004	1,253		352	621	2,226	George De Ruyter - D&A Farms.pdf	8	This document is a permit application. The application distinguishes between "number of animals in open confinement" and "number of animals housed under one roof." Both numbers are included for mature dairy cows --- 337 open + 916 roof = 1253.
		Totals		14,603	1,860	2,652	5,621	**24,736**			
		Avg. Date	8/7/2005								

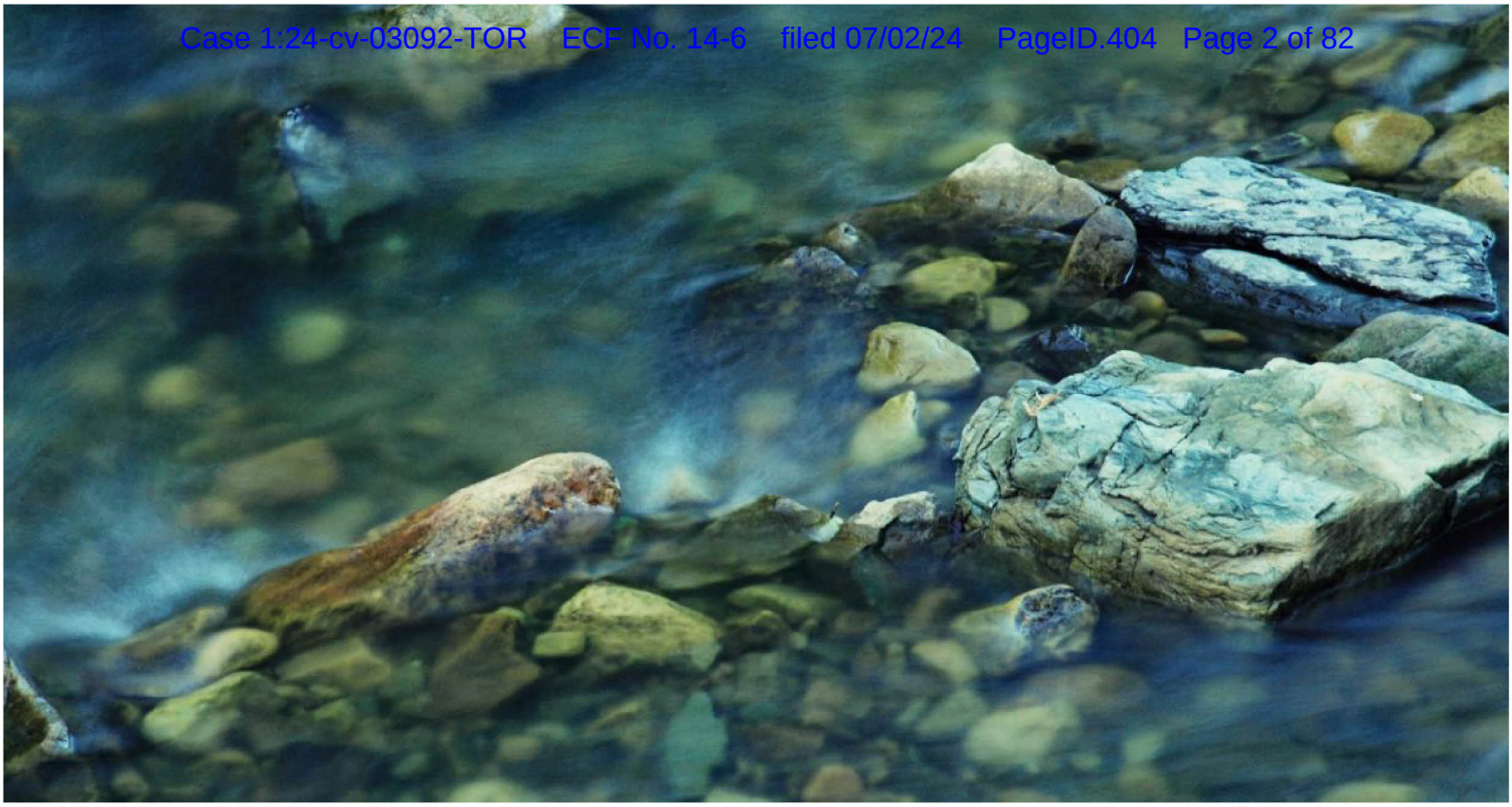
Year 2010 Estimate

County	AG ID	Facility	Date of Inspection or document	Milking	Dry	Heifers	Calves	Total Animals	Basis	Electronic Page
Yakima	9132	Cow Palace	1/19/2011	7070	1,003	445	2,900	11,418	CowPalace2_RT011911.pdf	4
Yakima	9199	Liberty Dairy/Henry Bosma Dairy	1/26/2010	5,000	900	600	1,700	8,200	HenryBosmaDairy_RT012610.pdf	2
Yakima	9701	George DeRuyter Dairy	1/25/2011	2970	500	0	900	4,370	GeorgeDeRuyter_RT012511.pdf	4
Yakima	2014	D & A Farms	1/25/2011	1627	0	1,650	0	3,277	D&Afarms_RT012511.pdf	4
		Totals		16,667	2,403	2,695	5,500	**27,265**		
		Avg. Date	10/24/2010							

2023 Annual Report Appendices F, G, and H

	Milking	Dry	Heifers	Calves	Total Animals	Solid Manure (tons)	Process Wastewater (gallons)	Liquid Manure (gallons)
Cow Palace	7,800	1,200	450	3,600	13,050	165,000	44,588,481	11,931,611
Liberty/Bosma	5,000	550	1,000	900	7,450	97,000	29,300,000	10,815,000
DeRuyter/D & A	5,300	600	4,830	0	10,730	89,714	19,868,627	13,987,046
Totals	18,100	2,350	6,280	4,500	**31,230**	351,714	93,757,108	36,733,657

Eric Winiecki Declaration
Exhibit F



March 1, 2024
Yakima Valley Dairies | SDWA-10-2013-0080

ANCHOR QEA

Yakima Valley Dairies 2023 Annual Report

Prepared for Cow Palace, LLC
George DeRuyter & Son Dairy, LLC; D&A Dairy, LLC; George & Margaret, LLC
Liberty Dairy, LLC; H&S Bosma Dairy

March 1, 2024
Yakima Valley Dairies | SDWA-10-2013-0080

Yakima Valley Dairies 2023 Annual Report

Prepared for
Cow Palace, LLC
George DeRuyter & Son Dairy, LLC; D&A Dairy, LLC;
George & Margaret, LLC
Liberty Dairy, LLC; H&S Bosma Dairy

Prepared by
Anchor QEA
949 Market Street, Suite 700
Tacoma, Washington 98042
In association with Agrimanagement, Inc.,
and Landau Associates, Inc.

Project Number: 240996-01.01
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TABLE OF CONTENTS

Executive Summary ES-1

1 Introduction 1

2 Alternative Drinking Water Supply 3

2.1 Evaluation and Treatment System Installations 3

2.2 2023 Maintenance of Water Systems 3

3 Actions to Further Control Potential Sources of Nitrogen 6

3.1 Solid Separators 6

3.2 Backflow Prevention 6

3.3 Cow Pens 6

3.4 Roof Runoff 7

3.5 Elimination of Furrow Irrigation 7

3.6 Lagoons 7

3.6.1 Cow Palace Dairy 8

3.6.2 Liberty/H&S Bosma Dairies 10

3.6.3 George DeRuyter & Son/D&A Dairies 13

4 Groundwater Monitoring Program 16

4.1 Groundwater Monitoring Quality Assurance Project Plan 17

4.2 Well Installation and Maintenance 17

4.2.1 Dedicated Bladder Pumps 17

4.2.2 Monitoring Well Pressure Transducers 17

4.3 Quarterly Groundwater Monitoring Data Reports 18

4.4 Summary of Findings 18

4.4.1 Groundwater Nitrate Monitoring 18

4.4.2 Groundwater Nitrate Concentration Trend Analysis 19

4.4.3 Site Hydrogeology 21

5 Actions to Ensure Effective Nutrient Management 24

5.1 Application Fields 24

5.2 Irrigation Water Management 25

5.2.1 Sensor Installation and Maintenance 25

5.2.2 Irrigation Monitoring Results 26

5.3 Cow Palace Dairy Application Fields 27

5.3.1 Soil Nitrate Level Summary 27
5.3.2 Application Field Management 28
5.3.3 Field Moisture Management 28
5.4 Liberty/H&S Bosma Dairies Application Fields 28
5.4.1 Soil Nitrate Level Summary 29
5.4.2 Application Field Management 29
5.4.3 Field Moisture Management 29
5.5 George DeRuyter & Son/D&A Dairies Application Fields 30
5.5.1 Soil Nitrate Level Summary 30
5.5.2 Application Field Management 30
5.5.3 Field Moisture Management 31
5.6 Off-Site Transfers 31

6 Other Reports, Plans, and Actions 33
6.1 Annual Reports 33
6.2 Quality Assurance Project Plans 33
6.3 Health and Safety Plan 33
6.4 Public Involvement 33

7 References 34

8 Certifications 37
Cow Palace Dairy Certification 37
George DeRuyter & Son Dairy, D&A Dairy, and George & Margaret Certification 38
Liberty Dairy Certification 39

TABLES

Table 1 Reverse Osmosis System Maintenance Summary, 2013 to 2023
Table 2 Cow Palace Lagoons – Summary of Gallons Measured in Sumps During 2023
Table 3 Groundwater Monitoring Well Construction Data
Table 4 Historical Groundwater Chemistry Data, 2013 to 2023
Table 5 Historical Groundwater Elevations, 2013 to 2023
Table 6 Summary of Compiled Nitrate Monitoring Data – Yakima Valley Dairies (AOC Wells)
Table 7a Cow Palace Dairy Manure Nutrient Concentrations – Total N, 2013 to 2023
Table 7b Cow Palace Dairy Manure Nutrient Concentrations – Total NH4, 2013 to 2023

Table 7c	Cow Palace Dairy Manure Nutrient Concentrations – Total P, 2013 to 2023
Table 7d	Cow Palace Dairy Manure Nutrient Concentrations – Total K, 2013 to 2023
Table 8a	Liberty Dairy Manure Nutrient Concentrations – Total N, 2013 to 2023
Table 8b	Liberty Dairy Manure Nutrient Concentrations – Total NH4, 2013 to 2023
Table 8c	Liberty Dairy Manure Nutrient Concentrations – Total P, 2013 to 2023
Table 8d	Liberty Dairy Manure Nutrient Concentrations – Total K, 2013 to 2023
Table 9a	George DeRuyter & Son Dairy Manure Nutrient Concentrations – Total N, 2013 to 2023
Table 9b	George DeRuyter & Son Dairy Manure Nutrient Concentrations – Total NH4, 2013 to 2023
Table 9c	George DeRuyter & Son Dairy Manure Nutrient Concentrations – Total P, 2013 to 2023
Table 9d	George DeRuyter & Son Dairy Manure Nutrient Concentrations – Total K, 2013 to 2023
Table 10	Irrigation Sensor Review – 2023 Field Capacity Exceedance List
Table 11	2023 Cow Palace Dairy Application Field Soil Sample Results
Table 12	2023 Liberty/H&S Bosma Dairies Application Field Soil Sample Results
Table 13	2023 George DeRuyter & Son/D&A Dairies Application Field Soil Sample Results

FIGURES

Figure 1	Dairy Locations and Monitoring Well Network
Figure 2	Residential Well Sampling Locations
Figure 3	Progress of Lagoon Lining and Abandonments
Figure 4	Conceptual Site Model
Figure 5	Conceptual Site Model Flow Chart
Figure 6	2023 Groundwater Nitrate Concentrations
Figure 7a	Surficial Aquifer Groundwater Elevation Contour Map First Quarter 2023
Figure 7b	Surficial Aquifer Groundwater Elevation Contour Map Second Quarter 2023
Figure 7c	Surficial Aquifer Groundwater Elevation Contour Map Third Quarter 2023
Figure 7d	Surficial Aquifer Groundwater Elevation Contour Map Fourth Quarter 2023
Figure 8	Groundwater Nitrate Concentrations – Upgradient Monitoring Wells, 2013 to 2023
Figure 9	Groundwater Nitrate Concentrations – Northern Downgradient Monitoring Wells, 2013 to 2023
Figure 10	Groundwater Nitrate Concentrations – Central Downgradient Monitoring Wells, 2013 to 2023

Figure 11	Groundwater Nitrate Concentrations – West Downgradient Monitoring Wells, 2013 to 2023
Figure 12	Groundwater Nitrate Concentrations – East Downgradient Monitoring Wells, 2013 to 2023
Figure 13a	Nitrate Isoconcentration Contour Map – Historical Maximum Running Average
Figure 13b	Nitrate Isoconcentration Contour Map – Most Recent Running Average
Figure 14	Nitrate Concentration Trend Summary
Figure 15a	Nitrate Trend Plots – Central Area Wells
Figure 15b	Nitrate Trend Plots – Eastern Area Wells
Figure 15c	Nitrate Trend Plots – Western Area Wells
Figure 16	Fall 2023 Compliance with Target Nitrogen Levels
Figure 17	Irrigation Water Management Plan Conceptual Site Model
Figure 18	Moisture Sensor Data – Example
Figure 19	Number of Fields with Soil NO3 over 45 ppm in the Second Foot, 2013 to 2023
Figure 20	Trends in Post-Harvest Nitrate Concentrations in Cow Palace Dairy Application Fields Expressed as Area-Weighted Concentrations
Figure 21	Trends in Post-Harvest Nitrate Concentrations in Liberty/H&S Bosma Dairies Application Fields Expressed as Area-Weighted Concentrations
Figure 22	Trends in Post-Harvest Nitrate Concentrations in George DeRuyter & Son/D&A Dairies Application Fields Expressed as Area-Weighted Concentrations

APPENDICES

Appendix A	Reverse Osmosis System Outreach Documents
Appendix B	Lagoon Maintenance Information
Appendix C	2023 Quarterly Groundwater Monitoring Data Reports
Appendix D	Seasonal Groundwater Elevation Patterns
Appendix E	2023 Application Field Season Reports
Appendix F	2023 Cow Palace Dairy CAFO Annual Report
Appendix G	2023 Liberty/H&S Bosma Dairies CAFO Reporting Data
Appendix H	2023 George DeRuyter & Son/D&A Dairies CAFO Annual Report

ABBREVIATIONS

AFMP	application field management plan
AOC	Administrative Order on Consent
bgs	below ground surface
CAFO	Concentrated Animal Feeding Operation
CDMA	code division multiple access
Consent Order	Administrative Order on Consent
DAF	dissolved-air flotation
Dairies	Yakima Valley Dairies
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
GCL	geosynthetic clay liner
HASP	health and safety plan
HDPE	high-density polyethylene
IWMP	irrigation water management plan
K	potassium
Lagoon O&M Plan	*Cow Palace Lagoon Operation and Maintenance Plan*
MCL	maximum contaminant level
MDL	method detection level
MG	millions of gallons
mg/L	milligrams per liter
N	nitrogen
NH4	ammonium
NDN	nitrification/denitrification
NE Catch Basin	Cow Palace Dairy Northeast Catch Basin
Northwest Linings	Northwest Linings and Geotextile Products, Inc.
NRCS	Washington Natural Resources Conservation Service
NW Catch Basin	Cow Palace Dairy Northwest Catch Basin
O&M	operations and maintenance
P	phosphorus
ppm	parts per million
QAPP	quality assurance project plan
RO	reverse osmosis
SOW	Statement of Work
TKN	total Kjeldahl nitrogen
VWC	volumetric water content

Yakima Valley Dairies	1) Cow Palace, LLC; 2) D&A Dairy, LLC (also known as D and A Dairy, L.L.C.), George DeRuyter & Son Dairy, LLC, and George & Margaret, LLC; and 3) Liberty Dairy, LLC, and its associated dairy facility H&S Bosma Dairy

Executive Summary

This 2023 Annual Report summarizes work done and data collected by 1) Cow Palace, LLC; 2) George DeRuyter & Son Dairy, LLC, D&A Dairy, LLC[1] (also known as D and A Dairy, L.L.C.), and George & Margaret, LLC; and 3) Liberty Dairy, LLC, and its associated dairy facility H&S Bosma Dairy (collectively referred to as the Yakima Valley Dairies or Dairies).

The Dairies and the U.S. Environmental Protection Agency (EPA) have exchanged correspondence regarding next steps under Administrative Order on Consent (Consent Order) Docket No. SDWA-10-2013-0080 following completion of the first 8 years of required work. Consistent with the dispute resolution provisions of the Consent Order, counsel for the Dairies requested in a letter to John Matthew Moore (EPA Counsel) dated June 3, 2022; a joint technical and legal meeting with EPA to discuss future groundwater monitoring; other testing and reporting requirements; and next steps under the Consent Order. The Dairies submitted a follow-up request on June 29, 2022. The Dairies are awaiting a response to this request. In the interim, the Dairies have conducted voluntary groundwater monitoring and reporting, continued monitoring their application fields consistent with Concentrated Animal Feeding Operation (CAFO) permit requirements (using the same soil testing procedures as previously performed under the Consent Order), and voluntarily provided this annual report.

The Dairies and EPA signed the Consent Order in March 2013 to address nitrate contamination of the drinking water aquifer beneath and downgradient of the Dairy facilities.

The goal of the Consent Order is to achieve drinking water quality that meets the EPA maximum contaminant level (MCL) for nitrate of 10 milligrams per liter (mg/L) in the drinking water aquifer beneath and downgradient of the Dairies. Exposure to nitrate at concentrations that exceed the MCL is linked to methemoglobinemia, or "blue baby syndrome," in infants, a potentially fatal condition in which the blood system cannot carry enough oxygen around the body. Four Consent Order objectives support this goal, including providing safe drinking water to residents whose well water exceeds the nitrate federal drinking water standard, taking actions to control potential sources of nitrogen at the Dairies, monitoring groundwater to ensure the effectiveness of source control actions, and ensuring effective nutrient management at the Dairies to reduce the introduction of nitrate to the drinking water aquifer.

In 2013, the Dairies collectively kept approximately 25,000 animals on their facilities. Each Dairy was and is a large Concentrated Animal Feeding Operation. The relationship of the Dairy facilities with nitrate migration and groundwater contamination is depicted in the conceptual site model contained in this Annual Report (Figures 4 and 5). Data summarized in this Annual Report were collected and analyzed by the Dairies in accordance with EPA-approved quality assurance project plans (QAPPs).

[1] D&A Dairy has changed its operating name to D&J Dairy. The original name as recorded on the Consent Order is retained in this report to avoid confusion.

QAPPs are designed to ensure that all data are of known and documented quality, of sufficient quantity, legally defensible, and suitable for their intended use.

In 2013, in accordance with the Consent Order, the Dairies identified 223 private residences within the boundary of, or within 1 mile downgradient of their facilities. Forty-five residences already had reverse osmosis (RO) treatment units in place, and 67 additional residences exceeded the nitrate MCL of 10 mg/L as determined by laboratory analysis conducted by the Dairies. Some residences were vacant, could not be reached after multiple attempts, or refused to participate in the sampling. In 2013, residential drinking water samples that were sent by the Dairies to a laboratory for analysis indicated that nitrate concentrations in the samples ranged from 3.06 mg/L to 51.6 mg/L.

In accordance with the Consent Order, in 2013 the Dairies offered to install and maintain RO systems at residences that exceeded the MCL and offered to maintain RO systems at residences that already had one. An additional 18 units have been installed since that time; this includes 16 residences whose wells were tested during the 2013 outreach effort but who did not respond to an offer for RO system installation at that time. The 17th residence has been built since the 2013 outreach effort and shares a well on the same parcel with a residence that tested above the MCL in 2013. One well serves two separate residences with the same address. The 18th residence was categorized as "Not Home" during the 2013 outreach effort, but it is presumed to share a well with a neighboring residence that had an RO system present during the 2013 outreach effort and accepted the offer of annual RO system maintenance. Installation dates are as follows: nine RO systems were installed in 2016, one was installed in 2017, one was installed in 2018 (but uninstalled due to a leaking component prior to 2020 and reinstalled in 2021), one was installed in 2020, one was installed in 2021, one was installed in 2022, one was installed in 2023, and installation dates for three RO systems are unknown. All residences are located within the 1-mile downgradient area and are included in Table 1. The RO systems were installed or maintained based on the 2013 test results.

In 2023, the Dairies provided maintenance of RO drinking water treatment units to 61 downgradient residences and provided bottled water to three downgradient residences, including one residence that receives both bottled water service and RO system maintenance. To date, bottled water service has been discontinued at five residences, including four residences that previously received bottled water and RO system maintenance but transitioned to RO system maintenance only in 2021 and one residence that previously only received bottled water service but had an RO system installed and discontinued bottle water service in 2022.

The Consent Order provides that the Dairies may discontinue the provision of an alternative water supply to a residence if they demonstrate to EPA that the nitrate level in a drinking water well is consistently below the MCL over a 2-year period, as measured on a quarterly basis (eight quarters). Since the Consent Order was signed in 2013, the Dairies have not proposed to discontinue the provision of alternative water to any residence on this basis.

In 2023, the average concentration of total nitrogen in liquid manure samples was 949 parts per million (ppm) in Cow Palace lagoons, 2,580 ppm in H&S Bosma lagoons, and 1,760 ppm in the George DeRuyter & Son lagoons (see Tables 7a, 8a, and 9a).

Under the Consent Order, the Dairies are nearing completion of lining or abandonment of 41 earthen animal waste storage lagoons to reduce or eliminate nitrogen leakage from the lagoons to subsurface soils and groundwater. The Dairies have completed the lining or abandonment of an additional three lagoons not covered by the Consent Order.

Lining and abandonment activities at Cow Palace Dairy were completed in 2020. Lining and abandonment activities at George DeRuyter & Son/D&A Dairies were completed in 2022. Interim abandonment actions for the final three remaining Liberty/H&S Bosma Dairies lagoons (Bosma Lagoon Nos. 1, 2, and 3) were completed in 2023. Liberty/H&S Bosma Dairies will continue monitoring the lagoons in accordance with the Interim Abandonment Plan until the Final Abandonment Plan is approved by EPA.

On a volume basis using the initial capacities of the original lagoons, at the end of 2023, the three Dairies have lined or abandoned 83% of their 126.1-million-gallon lagoon storage capacity. Cow Palace Dairy has lined or abandoned 100% of its 31.7-million-gallon lagoon storage capacity. George DeRuyter & Son/D&A Dairies have completed the lining or abandonment of 100% of their 38.9-million-gallon lagoon storage capacity. Liberty/H&S Bosma Dairies have completed the lining or abandonment of 62% of their 55.5-million-gallon lagoon storage capacity. The remaining three Liberty/H&S Bosma Dairies lagoons remain empty pending approval and implementation of the Final Abandonment Plan as submitted to EPA in 2022.

In 2023, George DeRuyter & Son Dairy continued to operate its manure digester, producing low-carbon biogas for alternative fuels production. During 2023, the digester produced 96 million cubic feet of low-carbon biogas for alternative fuel production. The Dairy also continued to operate its nitrogen treatment system, called a nitrification/denitrification (NDN) system. That maintenance was completed in early 2023, and the NDN system was returned to service to treat the dairy's manure.

The original 8 years of quarterly groundwater monitoring required by the Consent Order were completed during Second Quarter 2021. After consultation with EPA, the Dairies voluntarily implemented additional monitoring events between Fourth Quarter 2021 and Fourth Quarter 2023. Results for all four 2023 groundwater monitoring events are summarized in this report along with past data collected under the Consent Order.

Nitrate concentrations in downgradient wells ranged from 0.62 mg/L in monitoring well YVD-17 to 140 mg/L in monitoring well DC-03. Groundwater nitrate concentrations in three upgradient wells

were below the MCL throughout 2023. The fourth upgradient well, YVD-02, was dry throughout 2023. Historical groundwater concentration plots for nitrate are provided in Figures 8 through 12.

Groundwater data collected from 2013 through December 2023 have been analyzed for trends in nitrate concentrations as summarized in this report. Observed trends in the 26 Consent Order wells include the following:

- **Wells below the MCL:** Ten of the 23 wells screened across the water table have nitrate concentrations below the MCL:
  - Upgradient wells (4): Three upgradient wells (DC-01, YVD-03, and YVD-04) exhibited nitrate concentrations consistently below the MCL or were dry during the most recent four sampling events. The fourth upgradient well (YVD-02) has been dry for the past 13 monitoring events. None of the upgradient wells exhibited an increasing trend.
  - Northerly downgradient wells (4): Four wells located on the Dairies (YVD-05, YVD-06, YVD-07, and DC-09) have exhibited nitrate concentrations consistently below the MCL during the most recent four sampling events. None of the upgradient wells exhibited an increasing trend.
  - Central downgradient wells (2): Two wells located on the southern portion of the Dairies (DC-07 and YVD-17) have exhibited nitrate concentrations consistently below the MCL during the most recent four sampling events.
- **Downgradient water table wells (13):** Decreasing nitrate concentrations have been observed in 11 of the remaining 13 wells, with statistically significant decreasing trends in 7 wells. Increasing trends were only observed in 2 wells:
  - Seven downgradient wells exhibit decreasing trends that are statistically significant (DC-03, DC-04, DC-05, DC-14, YVD-10, YVD-14R, and YVD-15). All of these wells had previously exhibited increasing trends.
  - Four downgradient wells (YVD-08, YVD-11, YVD-12, and YVD-16) exhibit decreasing nitrate concentrations (observed decreases in running average nitrate concentrations have ranged from 5% to 16%), but the downward trends are not statistically significant. The trends for these wells are listed as "flat" in Table 6 and Figure 14. YVD-08 previously exhibited an increasing trend. This trend stabilized following reduction of application field nitrogen concentrations and lining of nearby manure lagoons.
  - Two downgradient water table wells exhibit increasing trends (YVD-09 and YVD-13). YVD-13 is located in an area with a thick overlying silt layer. It may be responding with a lag to higher groundwater nitrate concentrations in adjacent areas to the east.
- **Deeper wells (3):** Two of the three deeper wells exhibit stable trends (DC-03D and DC-05D). Concentrations in YVD-18 exhibit an increasing trend, similar to co-located water table well YVD-13.

In support of the objective of effective nutrient management, the Dairies continued pre-plant and post-harvest soil and manure sampling to help ensure that the application of nitrogen to their crop fields does not exceed agronomic rates. This sampling is required under the CAFO permit requirements for each Dairy. Overall, nitrogen levels in fields to which manure is applied have declined significantly at all three monitored depth intervals from excessive levels that were measured by the Dairies in 2013 (Figures 20, 21, and 22).

Fall post-harvest nitrate concentrations in the application fields at all three Dairies remained below the 45-ppm target at the 2-foot depth interval (12 to 24 inches), except for one George DeRuyter & Son Dairy application field (GDS-SU04 at 51 ppm).

The Dairies collected "post-harvest" representative soil samples from the 1-foot, 2-foot, and 3-foot depth intervals below ground surface from each application crop field. As of fall 2023, the nitrate-N levels at the 2-foot and 3-foot depth intervals average less than 19 ppm, well below the 45-ppm target value established in the Consent Order for the 2-foot depth interval. These values have decreased an average of approximately 80% since the execution of the Consent Order in 2013.

Based on fall 2023 post-harvest soil data, collectively in all the Dairies' crop fields there were about 111 tons of nitrate-N at the 1-foot soil depth (a decrease of 67% since 2013), about 66 tons at the 2-foot depth (a decrease of 81% since 2013), and about 81 tons at the 3-foot depth (a decrease of 77% since 2013). At EPA's direction, these estimates were developed by multiplying the area-weighted nitrate-N estimates developed by the Dairies for each crop field at each soil depth, multiplying by the number of acres of crop fields for each Dairy to estimate the pounds of nitrate in the fields for each Dairy at each depth, adding the pounds at each soil depth at each Dairy to estimate the total pounds of nitrate at all the Dairies at each soil depth, and dividing by 2,000 to convert to tons. These estimates do not include additional nitrogen in the form of ammonium, mineralization from past manure, or mineralization from organic matter, which are likely to break down and form additional nitrate.

Nitrate is highly mobile in water, and the nitrate in the soil column is vulnerable to leaching and migration into the groundwater. The Dairies have converted many of their fields to alfalfa production or grow alfalfa as part of crop rotation. Established multiyear stands of alfalfa can pull nitrate out of the soil deeper than 2 feet if the roots are allowed sufficient time to grow deeper into the soil profile. The strong decreases in average nitrate-N levels at the 3-foot level suggests that such deep nitrogen utilization is occurring.

To minimize the discharge of nitrate-laden irrigation water out of the root zone, the Dairies continued to monitor soil moisture levels in their application fields (see the charts in Appendix E). The Consent Order requires at least two soil moisture monitoring locations in each of the Dairies' 34 application fields. Each monitoring location, or "station," includes three sensors at different soil depths. Most fields

have two sensor stations, and some have three. The number of stations identified for placement in each field was based on consideration of the location and type of susceptible areas (those areas within each field that may be the most susceptible to the migration of irrigation water below the crop root zone, such as low-lying areas within soils with the greatest permeability) as well as the irrigation method being used in that field. There are currently 73 moisture sensor stations, including two sensors per application field. Table 10 summarizes the network of irrigation sensor stations.

Movement of nitrate-laden water out of the root zone can also mobilize nitrate deeper in the soil column from past over-applications of nitrogen and transport it to the drinking water aquifer. The Dairies and Agrimanagement, Inc., continue to conduct maintenance and repairs as necessary to keep the 73 irrigation sensors operational.

Based on data from operating sensor stations, total field capacity exceedances observed at the 3-foot depth per sensor for Cow Palace Dairy, Liberty/H&S Bosma Dairies, and George DeRuyter & Son/D&A Dairies occurred over only 2.0%, 0.9%, and 2.1% of the entire 2023 irrigation season, respectively. Some of these exceedances appear to be due to spring wet-weather conditions unrelated to field irrigation. It is impossible to eliminate the discharge of water from all fields all the time, but the duration of discharges due to irrigation can be managed if enough data are properly collected and utilized.

The Dairies continued to implement controls and monitoring for their off-site shipments of manure consistent with CAFO permit requirements for each of the Dairies.

1 Introduction

This Annual Report was prepared by Anchor QEA in association with Agrimanagement, Inc., and Landau Associates, Inc., on behalf of: 1) Cow Palace, LLC; 2) George DeRuyter & Son Dairy, LLC, D&A Dairy, LLC[2] (also known as D and A Dairy, L.L.C.), and George & Margaret, LLC; and 3) Liberty Dairy, LLC, and its associated dairy facility H&S Bosma Dairy (collectively referred to as the Yakima Valley Dairies [Dairies]). Dairy locations are shown in Figure 1.

The Dairies and the U.S. Environmental Protection Agency (EPA) have exchanged correspondence regarding next steps under Administrative Order on Consent (Consent Order) Docket No. SDWA-10-2013-0080 following completion of the first 8 years of required work. Consistent with the dispute resolution provisions of the Consent Order, counsel for the Dairies requested in a letter to John Matthew Moore (EPA Counsel) dated June 3, 2022; a joint technical and legal meeting with EPA to discuss future groundwater monitoring; other testing and reporting requirements; and next steps under the Consent Order. The Dairies submitted a follow-up request on June 29, 2022. The Dairies are awaiting a response to this request. In the interim, the Dairies have conducted voluntary groundwater monitoring, continued monitoring of application fields consistent with Concentrated Animal Feeding Operation (CAFO) permit requirements for each Dairy (using the same soil testing procedures as previously performed under the Consent Order), and voluntarily prepared this annual report.

This report outlines activities undertaken by the Dairies pursuant to the Consent Order (EPA 2013) and Statement of Work (SOW) during the calendar year 2023, which covers the period from January 1 to December 31, 2023. This report includes the information required by Section III.K.2 of the SOW.

The goal of the work conducted in accordance with the Consent Order is to achieve drinking water quality that meets EPA maximum contaminant level (MCL) for nitrate of 10 milligrams per liter (mg/L) in the drinking water aquifer beneath and downgradient of the Dairies. The objectives of the work conducted in accordance with the SOW are as follows:

1. Expeditiously provide a permanent, safe alternative drinking water supply to residents using private drinking water wells that exceed the MCL for nitrate (nitrate as nitrogen, or N03-N) and are on or within 1 mile downgradient of the Dairies.
2. Take specific actions to further control potential sources of nitrogen at the Dairies.
3. Establish a network of monitoring wells to measure the effectiveness of the nitrogen source reduction actions on water quality in the shallow alluvial aquifer that serves as an underground source of drinking water.

[2] D&A Dairy has changed its operating name to D&J Dairy. The original name as recorded on the Consent Order is retained in this report to avoid confusion.

4. Ensure effective nutrient management at the Dairies to reduce the introduction of nitrate to an underground source of drinking water.

In 2023, EPA and the Dairies corresponded via teleconference meetings, document submittals, and EPA comment letters regarding a number of actions pursuant to the Consent Order. EPA comment letters are noted (as applicable) throughout this report.

2 Alternative Drinking Water Supply

2.1 Evaluation and Treatment System Installations

In accordance with the Consent Order, in 2013, the Dairies identified 223 private residences within the boundary of or within 1 mile downgradient of their facilities. Thirty-three residences were vacant, could not be reached after multiple attempts, or refused to participate in the sampling. Out of 142 residences that were sampled for nitrate in drinking water (either by Hach test strip or laboratory analysis), 68 residences exceeded the MCL for nitrate in drinking water of 10 mg/L. Laboratory analyses conducted by the Dairies showed that nitrate concentrations in the residential samples ranged from 3.06 mg/L to 51.6 mg/L. Additionally, separate from the Consent Order, 45 residences were documented to have a reverse osmosis (RO) treatment system already installed at the time of sampling. Pre-treatment nitrate concentrations at several Cow Palace employee residences with already installed RO systems ranged from 9.18 mg/L to 72.8 mg/L. A comprehensive dataset of the residential well sampling locations is provided in Figure 2.

In accordance with the Consent Order, in 2013, the Dairies also offered to install and maintain RO systems at residences that exceeded the MCL and offered to maintain RO systems at residences that already had one. At the remaining locations, the Dairies offered to fund the installation and maintenance of RO treatment systems or to provide bottled water. A total of 36 residences accepted the offer for a new RO system, and 8 residences were supplied with bottled water. The Dairies also committed to maintain RO systems at an additional 15 residences where RO systems had been previously installed by the residences. Since 2013, additional RO systems have been installed and bottled water service has been discontinued at five residences.

2.2 2023 Maintenance of Water Systems

As of 2023, there were a total of 61 residences within the 1-mile downgradient boundary of the Dairies that have accepted water system installation or maintenance. A summary of 2023 outreach and maintenance activities for these 61 residences is summarized in Table 1. A typical annual RO system maintenance appointment includes replacement of the 10-inch 1-micron sediment filter, replacement of the nitrate-removal cartridge, and replacement of the pre- and post-RO filters. The RO system is checked for wear and tear and leaks, and components are replaced as needed. Water from the tap is tested for nitrates to confirm the system has been installed or serviced properly.

Outreach activities were conducted by Anchor QEA to coordinate the RO system maintenance in 2023. Outreach activities included mailing bilingual RO system maintenance notification postcards written in English and Spanish (Appendix A), phone calls conducted in English and Spanish, and door-to-door outreach with a Spanish-language interpreter available on call.

RO system maintenance notification postcards written in English and Spanish were mailed in May and October 2023. Contact information to schedule an appointment for both English and Spanish speakers was included on either side of the postcard. One week after each round of RO maintenance notification postcards was mailed to residences, phone call outreach was conducted.

Phone call outreach was conducted in English and Spanish. Residences who provided contact information from previous year's outreach efforts were contacted first to schedule annual RO system maintenance appointments. Depending on when a residence responded to the offer of maintenance, multiple calls were made in an attempt to schedule an appointment.

Door-to-door visits were conducted at residences if the phone number was unknown, if the phone number was no longer in service, or if the previous occupant stated they no longer lived at the address. Door-to-door outreach was conducted in May 2023 after the first round of postcards and phone calls, then in November 2023 after the second round of phone calls and postcards. Both door-to-door outreach efforts included 2 days of in-person visits, with 1 day of door-to-door visits in the morning and the other day in the evening. If a residence chose to provide their contact information during these visits, the residence was contacted by phone and an appointment for the next available appointment date was scheduled the same day or the following day. Otherwise, appointments were scheduled as soon as the residence called to schedule an appointment. A maintenance notification postcard was provided to each residence, if access to the front door was inaccessible due to "No Trespassing" signs, closed gates, or aggressive dogs; the postcard was left in a visible location on the gate or other obvious point of entry from the main road.

Thirteen residences with laboratory results above 27 mg/L nitrate and who accepted an offer of RO system installation or RO system maintenance in 2013, or who have had an RO system installed since then, were offered the option of an additional RO maintenance appointment in November 2023, if the residence had received RO maintenance at least 4 months prior. All 13 residences received annual RO system maintenance in 2022.

Of these 13 residences:

- Five accepted the offer of additional RO system maintenance.
- Six received RO system maintenance less than 4 months prior.
- Two residences did not respond to an offer of additional maintenance in November 2023.

Six residences were not responsive to any outreach efforts, and five residences declined RO system maintenance. Three residences scheduled an appointment but were not home at the scheduled time and date, and the residents did not respond to subsequent calls to reschedule maintenance. Two residences were vacant.

In 2023, bottled water service was provided to three residences. To date, bottled water service has been discontinued at five residences. Prior to 2021, eight residences received bottled water delivery service. Of these residences, seven did not respond to an offer of RO system installation in 2013, and one residence refused installation. Since then, five residences have had an RO system installed while still receiving bottled water service. Notifications were sent to these five residences in May 2021 notifying them that they would be transitioned from bottled water service and RO system maintenance to RO system maintenance only. In 2021, two of the five residences accepted the offer of annual RO system maintenance and were transitioned to RO system maintenance only. Another two residences did not respond to outreach efforts; of these two, one had not accepted any bottled water deliveries for the entire year of 2021, and the other residence accepted bottled water deliveries for only 3 months out of the year. The fifth residence requested to maintain both bottled water delivery service and RO system maintenance. In 2022, an RO system was installed at one residence that previously received bottled water service only. In total, four residences have transitioned to RO system maintenance only, three of these residences received annual RO system maintenance in 2023, and one resident declined service in 2023. One resident was provided with bottled water service but was not present for the scheduled RO system maintenance appointment and did not respond to attempts to reschedule. Two residences received bottled water service only.

3 Actions to Further Control Potential Sources of Nitrogen

This section describes the status of actions taken to control potential sources of nitrogen from the Dairies, apart from the management of application fields. Application field management is discussed in Section 5.

3.1 Solid Separators

Section III.F.4 of the SOW requires the Dairies to take action within 60 days of the Effective Date of the Consent Order to reduce nitrate contributions from solid separators at each Dairy. Actions must include the following: 1) relocating solid separators onto an impervious surface; 2) installing a berm and containing areas receiving solids; and 3) directing leachate to storage ponds or lagoons.

In 2013, a review was conducted of the solid separator areas at each Dairy. Results indicated solid separator areas at each Dairy were found to be in compliance with the requirements of the SOW, as described in the *2013 Annual Report* (IES 2016).

In 2023, the solids separation systems at each Dairy included the following:

- Slope screen separator and polymer system at Cow Palace Dairy (this system replaced the centrifuge previously operated by the Dairy as described subsequently)
- Centrifuge system at Liberty/H&S Bosma Dairies
- Dissolved-air flotation (DAF) system at George DeRuyter & Son/D&A Dairies

3.2 Backflow Prevention

Section III.F.5 of the SOW requires the Dairies to install and maintain backflow prevention devices within 30 days of the Effective Date of the Consent Order to protect wells at each Dairy.

In 2013, the presence of backflow prevention devices at each Dairy was confirmed, as described in the *2013 Annual Report* (IES 2016). The Dairies' backflow prevention devices are detailed as follows:

- Liberty Dairy and H&S Bosma Dairy had pre-existing backflow preventers on its three production wells.
- Cow Palace Dairy also had existing backflow preventers on its four production wells.
- George DeRuyter & Son Dairy and D&A Dairy had a total of three production wells. Two of the three wells had previously installed backflow preventers. The third was installed in 2014.

In 2023, the backflow prevention devices remained operational.

3.3 Cow Pens

Section III.F.10 of the SOW requires the Dairies to minimize the ponding of liquid in the cow pen areas to reduce infiltration of nitrogen-rich water.

In 2023, the Dairies continued implementing cow pen management actions at each Dairy to prevent liquid ponding and infiltration. Pens were graded to ensure liquid generated in the pens was conveyed to each Dairy's lagoon system. Low spots occurring over time as a result of cow traffic were regraded and filled to prevent ponding. Cow pens were scraped on a weekly basis to remove accumulated manure and bedding material from the areas. Additionally, feed-mixing areas are located on asphalt or concrete surfaces, and Dairies with free stalls (Liberty/H&S Bosma Dairies and George DeRuyter & Son/D&A Dairies) are equipped with concrete flush lanes.

3.4 Roof Runoff

Section III.F.11 of the SOW requires the Dairies to confirm that roof runoff is not allowed to pond on the ground and infiltrate; roof runoff must either be kept separated from contaminated areas or directed to lagoons.

In 2023, roof runoff continued to be conveyed to the Dairies' lagoon systems. Roof runoff in animal operation areas is conveyed to the cow pens and feed lanes either by gutter or direct runoff from the roof surface. From the cow pens and feed lanes, the roof runoff is directed to the lagoon system. Roof runoff in feed-mixing areas is conveyed to the drains associated with the silage piles. Roof runoff controls are described in the *2013 Annual Report* (IES 2016).

3.5 Elimination of Furrow Irrigation

Section III.F.8 of the SOW requires the Dairies to eliminate furrow irrigation at each Dairy within 2 years of the Effective Date of the Consent Order. Furrow irrigation, also known as flood irrigation, is an age-old irrigation technique that irrigates fields by running water in furrows between the crop rows. Furrow irrigation results in over-saturation of parts of the field and has been shown to result in a higher incidence of water and nutrient transport below the root zone in comparison to sprinkler irrigation.

In 2013, the Dairies had several crop fields that still employed furrow irrigation. Furrow irrigation was eliminated at each Dairy by converting these remaining fields to sprinkler systems, as described in the *2013 Annual Report* (IES 2016).

From 2014 to 2023, no furrow irrigation has been used by the Dairies.

3.6 Lagoons

Section III.F.6 of the SOW requires the Dairies to submit to EPA a Lagoon Review Report within 60 days of the Effective Date of the Consent Order demonstrating the existing lagoons were constructed to the current Washington Natural Resources Conservation Service (NRCS) 313 standard. The Dairies submitted Lagoon Review Reports (ARCADIS 2013a, 2013b, 2013c) that were approved by EPA on July 11, 2013. Save for one lagoon, Cow Palace Lagoon No. 4, the Dairies did not provide

documentation that showed that their other 40 lagoons were designed and built to meet current NRCS standards.

For the 40 lagoons that did not meet the current NRCS 313 standard, the Dairies were required to submit a Lagoon Evaluation Plan to assess whether the lagoons met the standard. In 2014, the Dairies submitted a Lagoon Evaluation Method Determination QAPP (ARCADIS 2014) and Lagoon Evaluation QAPPs (IES 2014a, 2014b, 2014c). However, on February 6, 2015, the Dairies notified EPA of their election to forgo testing of the lagoons and instead begin lining them in accordance with the requirements in the Consent Order.

In 2022, the Dairies lined or abandoned several lagoons in accordance with Section III.F.6 of the SOW.

3.6.1 Cow Palace Dairy

Cow Palace Dairy elected to line its manure storage lagoons with a double-membrane liner system. This system includes two high-density polyethylene (HDPE) liners separated by a drainage layer. The drainage layer can consist of a layer of geocomposite material (as used for the Northwest Catch Basin [NW Catch Basin] lined in 2016) or a lower membrane liner with a dimpled surface that allows drainage between the liners without the need for a geocomposite (as used on Consolidated Lagoon No. 2). A leak detection system is installed between the liners to detect and collect accumulations of leachate associated with leaks in the upper liner should they occur. Monitoring of leachate production from this system is used to determine when repairs of the upper liner are required.

Cow Palace Dairy also upgraded its lagoon network to expand storage capacity in some lagoons (e.g., the consolidation and expansion of Lagoon Nos. 2 and 3 in 2017 and the consolidation and expansion of Settling Basins A and B in 2020) and eliminate other unneeded lagoons. This included the abandonment of one of the Cow Palace Dairy lagoons (the Northeast Catch Basin [NE Catch Basin]).

Cow Palace Dairy completed lining of their lagoons in 2020. With abandonments and consolidations, the total number of lagoons at Cow Palace Dairy has been reduced from nine to six.

No lagoon design or construction activities remained to be completed in 2023. Lagoon operations and maintenance (O&M) activities were performed for all the lined lagoons. These activities are described in more detail in Section 3.6.1.1. The status of the Cow Palace Dairy lagoon program is summarized in Figure 3.

3.6.1.1 Operations and Maintenance of Existing Lined Lagoons

On February 24, 2023, Cow Palace Dairy submitted the *Cow Palace Lagoon Operation and Maintenance Plan* (Lagoon O&M Plan; LAI 2023). The Lagoon O&M Plan is applicable to all five Cow Palace lagoons in current operation and the one standby lagoon. The Lagoon O&M Plan was prepared in accordance with requirements from the EPA Region 10 Administrative Order on Consent (AOC) SDWA 10-2013-

0080. Specifically, the Lagoon O&M Plan was prepared in accordance with Section 4.6 of the *Cow Palace Lagoon Work Plan* (WET 2015). The Lagoon O&M Plan is a required document submittal under the AOC Appendix B Scope of Work, Section III(F)(6). O&M activities for existing lined lagoons included the following:

- **NW Catch Basin:** The NW Catch Basin was lined in 2016. Lagoon inspections and maintenance activities were completed for this lagoon during 2023. A total of 159,486 gallons of leachate were generated in 2023 (Table 2). This leachate was generated due to a leak caused by separation of the primary liner weld to the concrete overflow box that discharges from the NW Catch Basin to the Safety Debris Catch Basin. The following activities were conducted in response to the leak:
  - The leak was discovered on February 27, 2023.
  - The leak was classified as a large leak in accordance with the Lagoon O&M Plan.
  - EPA was informed of the leak in an email correspondence dated February 28, 2023.
  - Cow Palace lowered the level of NW Catch Basin to stop leachate flowing into the leak detection sump.
  - NW Catch Basin inspections were performed daily from February 28 to March 17, 2023, at which time it became apparent that the leak was isolated. Inspections continued on a weekly basis.
  - Northwest Linings and Geotextile Products, Inc. (Northwest Linings), was contacted to inspect and repair the leak. The leak was repaired on March 24, 2023.
  - Northwest Linings issued a certification report on April 6, 2023, documenting repair of the leak. Inspection forms and the Northwest Linings report are included in Appendix B.
- **Consolidated Lagoon No. 2:** This lagoon was expanded (including consolidation with former Lagoon No. 3) and lined in 2017. Lagoon inspections were completed for this lagoon during 2023. No leachate generation was noted during 2023 (Table 2). No significant maintenance or repair activities were required.
- **Lagoon No. 4:** This lagoon was previously shown to comply with applicable Natural Resource Conservation Service design requirements for waste storage lagoons. It has a clay-amended soil liner. This lagoon was not used during 2023.
- **Lagoon No. 1:** This lagoon was lined in 2019. The Lagoon No. 1 work was reviewed and approved by the Washington State Department of Ecology (Ecology) Dam Safety Office in early February 2020, after which the lagoon was returned to service. A leak in the upper liner was detected upon startup and repaired by Northwest Linings in May 2020. The lagoon was returned to service and no additional leachate production has been observed since that time. Lagoon inspections were completed in accordance with the O&M plan for this lagoon during 2023. No leachate production was noted during 2023 (Table 2). No significant maintenance or repair activities were required in 2023.

- **Settling Basin AB:** Settling Basins A and B were consolidated and lined in 2020. Measurable liquid was observed in the Settling Basin AB sump after it was put into service in April 2021. A plugged manure line adjacent to the lagoon resulted in wastewater leaking into the soil around the liner. This spilled wastewater flowed downgradient and seeped between the primary and secondary liners, making its way to the leak detection sump. Lagoon wastewater did not leak through the upper primary liner, and there are no integrity issues with the liner. Lagoon inspections were completed for this lagoon during 2023. Leachate production was 125 gallons in 2023 (Table 2). This amount is defined as a de minimis leak rate in accordance with Section 4.3.2.1 of the Lagoon O&M Plan. No significant maintenance or repair activities were required.
- **Safety Debris Catch Basin:** The safety debris catch basin was lined in 2019. Lagoon inspections were completed for this lagoon during 2023. No leachate production was noted during 2022 (Table 2). No significant maintenance or repair activities were required.

Records of daily (NW Catch Basin in March) and weekly inspections conducted in 2023 are included in Appendix B.

3.6.1.2 Submittals and Approvals

In 2023, Cow Palace Dairy submitted the following document related to lagoon construction:

- *Cow Palace Lagoon Operation and Maintenance Plan* (LAI 2023)

3.6.2 Liberty/H&S Bosma Dairies

Liberty/H&S Bosma Dairies elected to line their manure storage lagoons with a hybrid double-liner system. This system includes an HDPE liner placed over the top of a geosynthetic clay liner (GCL). In this system, each liner protects and reinforces the other. The upper HDPE liner protects the lower GCL from drying out or being eroded by lagoon maintenance activities. The GCL helps add durability to the lining system in that the GCL can self-seal from small punctures. In this application, the GCL also has a long operational life. Leak detection surveys for the upper liner are performed using a combination of visual and electronic leak detection surveys in alternating years.

As of 2023, Liberty/H&S Bosma Dairies operates seven lined lagoons for manure storage, which is reduced from the 22 lagoons that were previously operated. Other lagoons have been or are being eliminated through lagoon consolidation or abandonment. The abandonment of three empty, unused lagoons remains in progress, pending EPA review of the draft Final Abandonment Plan.

In 2023, Liberty/H&S Bosma Dairies updated its naming convention for the seven active manure storage lagoons. The naming convention currently used by Liberty/H&S Bosma Dairies is as follows:

- Lagoon 1: Formerly Consolidated Lagoon No. 15
- Lagoon 2: Formerly Lagoon No. 14

- Lagoon 3: Formerly the Red Water Pond
- Lagoon 4: Formerly Consolidated Lagoon No. 7
- Lagoon 5: Formerly Consolidated Lagoon No. 10
- Lagoon 6: Formerly Lagoon 6
- Lagoon 7: Formerly Consolidated Lagoon No. 4

As described in Section 3.6.2.1, the abandonment of former Lagoon No. 3 and former Lagoon Nos. 1 and 2 was initiated in 2021 and 2022, respectively, but is not yet complete. Interim abandonment actions for these three unused lagoons were completed in 2023 in accordance with the *H&S Bosma Dairy Lagoon Nos. 1, 2, and 3 Interim Containment Action Plan* (Anchor QEA 2022a), approved by EPA on December 21, 2022. The final abandonment of these lagoons will be performed following EPA review and approval of the draft Final Abandonment Plan.

Abandonment activities are described in more detail in Section 3.6.2.1. Lagoon O&M activities were performed for all the lined lagoons, as described in Section 3.6.2.2. Liberty/H&S Bosma Dairies submitted zero documents related to lagoon construction, but a pending approval is described in Section 3.6.2.3. The status of the Liberty/H&S Bosma Dairies lagoon program is summarized in Figure 3.

3.6.2.1 Abandonment of Lagoon Nos. 1, 2, and 3

Former Lagoon Nos. 1, 2, and 3 were historically used to manage liquid and solid manure and stormwater generated from normal dairy operations. These lagoons are no longer used for manure storage because of increased storage generated from lagoon consolidations and expansions and operational changes.

Lagoon Nos. 1, 2, and 3 are being abandoned to eliminate them as potential sources of nitrogen pollution to groundwater. Abandonment activities completed to date include the following:

- The Dairy notified EPA of its proposal to abandon the lagoons in December 2020 and submitted its first abandonment plan for all three lagoons in May 2021.
- In response to a request from EPA, the Dairy submitted a lagoon capacity review to EPA in April 2022 verifying that it had sufficient storage capacity to proceed with lagoon abandonment.
- All three lagoons have been removed from service and have been emptied of liquid and solid manures (cleanouts were completed at Lagoon No. 3 in November 2021, Lagoon No. 2 in May 2022, and Lagoon No. 1 in July 2022).
- Abandonment plans were previously submitted to EPA on May 27, 2021 (all three lagoons); January 18, 2022 (Lagoon No. 3); and April 25, 2022 (all three lagoons).
- EPA modified the April 2022 plan to focus on soil sampling requirements and conditionally approved that plan on May 12, 2022.

- Anchor QEA conducted soil sampling pursuant to the EPA-approved plan between May and September 2022, in addition to data collected previously in October and November 2021. Anchor QEA submitted an addendum to the Sampling and Quality Assurance Project Plan in November 2022 to resolve quality assurance issues associated with the original testing laboratory. Final soil testing data are included with this plan.
- Anchor QEA submitted a draft Interim Abandonment Plan to EPA on November 30, 2022, as required in EPA Letter 291. The plan was revised, renamed as the Interim Containment Action Plan, and resubmitted to EPA on December 18, 2022, to address comments provided by EPA in EPA Letter 294. That plan was modified and conditionally approved by EPA on December 21, 2022, in EPA Letter 295.
- The Dairy has completed the implementation of the Interim Containment Action Plan. That work was completed between late December 2022 and February 13, 2023.
- Interim abandonment actions for the final three remaining lagoons were completed in 2023 in accordance with the *H&S Bosma Dairy Lagoon Nos. 1, 2, and 3 Interim Containment Action Plan* (Anchor QEA 2022a), approved by EPA on December 21, 2022.

Anchor QEA submitted a draft Final Abandonment Plan to EPA on December 30, 2022, and is awaiting comments. The plan addresses methods for final lagoon abandonment. Final lagoon abandonment includes construction and maintenance of an evapotranspiration cap, run-on controls and runoff collection and pump-out facilities to prevent infiltration of precipitation or other waters into the soils beneath the former lagoons. The plan provides protection of groundwater resources from potential leaching of nitrogen from subsurface soils beneath the lagoons and complies with lagoon abandonment requirements of Washington's current CAFO permit applicable to large dairy facilities.

3.6.2.2 Operations and Maintenance of Existing Lined Lagoons

In 2023, Liberty Dairy continued performing routine weekly inspections of its seven lined lagoons as described in the *Uniform Lagoon Operations, Maintenance, and Monitoring Plan – Bosma and DeRuyter Dairies* (Anchor QEA 2020). The routine inspections include visual inspections of the following:

- The liner for evidence of slumps of bulges
- Damage to the liner (e.g., holes, tears, or damaged seams)
- The perimeter of the lagoon, looking specifically for signs of access from animals or workers, damage to fencing/barrier, presence of trees or vegetation, wind damage, or rodent activity
- The embankments, looking for signs of erosion
- Inlet and outlet piping to check for obstructions or damage
- Accumulation of solids in the lagoon
- The agitation equipment to ensure that it is properly secured with the tethered lines and positioned away from the side slopes and bottom of the lagoon

- Gas venting piping to check for obstructions or damage

Records of the weekly inspections conducted in 2023 are included in Appendix B.

During 2023, the Dairy also completed a biennial electronic leak detection survey at one of the seven existing lined lagoons (the remaining six lagoons are not due for a leak detection survey until 2024). The survey results are contained in Appendix B. The survey references the Dairy's updated lagoon numbering system as follows:

- Lagoon No. 7 (f.k.a. Consolidated Lagoon No. 4): Zero leaks were detected in the above-water and below-water portions of the lagoon.

3.6.2.3 Submittals and Approvals

In 2023, there were no submittals or approvals of Liberty/H&S Bosma Dairies documents related to lagoon activities.

The *H&S Bosma Dairy Lagoon Nos. 1, 2, and 3 Final Abandonment Plan* (Anchor QEA 2022b), submitted to EPA on December 30, 2022, is awaiting comment/approval.

3.6.3 George DeRuyter & Son/D&A Dairies

George DeRuyter & Son/D&A Dairies elected to line their manure storage lagoons with the same double-liner system used at the Liberty/H&S Bosma Dairies. That system includes an HDPE liner placed over the top of a GCL. Leak detection surveys for the upper liner are performed using a combination of visual and electronic leak detection surveys in alternating years.

George DeRuyter & Son/D&A Dairies completed lining of their lagoons in 2022. George DeRuyter & Son/D&A Dairies currently operates 7 lined lagoons for manure storage, which is reduced from the 10 lagoons that were previously operated. Other lagoons have been eliminated through lagoon consolidation or abandonment.

In 2023, George DeRuyter & Son/D&A Dairies updated its naming convention for the seven active manure storage lagoons. The naming convention currently used by George DeRuyter & Son/D&A Dairies is as follows:

- GDS Lagoon 1: No change in name
- GDS Lagoon 2: No change in name
- GDS Lagoon 3: No change in name
- GDS Lagoon 4: No change in name
- GDS Lagoon 5: Formerly the Stormwater Pond
- D&A Lagoon 1: Formerly GDS Consolidated Lagoon 1
- D&A Lagoon 2: Formerly GDS Consolidated Lagoon 3

The Dairy also operates one stormwater catch basin in its heifer pen area at the George DeRuyter & Son Dairy. Though not part of the Consent Order, that catch basin was lined in 2020 with the same lining system used for the seven manure storage lagoons. The heifer pen area catch basin replaced three prior catch basins (two were consolidated and one was abandoned).

The upgraded manure digestor and DAF unit remained operational in 2023. The Dairy also continued to operate a nitrification/denitrification (NDN) treatment system to reduce nitrogen concentrations in the Dairy's liquid manure. These activities are described in Section 3.6.3.1. Lagoon O&M activities were performed for all the lined lagoons, as described in Section 3.6.3.2. There were no submittals or approvals of George DeRuyter & Son/D&A Dairies documents related to lagoons, as noted in Section 3.6.3.3. The status of the George DeRuyter & Son/D&A Dairies Consent Order lagoon program is summarized in Figure 3.

3.6.3.1 Manure Digester, DAF, and NDN Treatment System

The George DeRuyter & Son Dairy three-lane manure digester remains in successful operation since repairs and upgrades to the digester were completed in 2019. Digester operations are managed in coordination with Regenis, an experienced digester company, and Promus Energy LLC, a sustainable biofuels marketing company.

In mid-2021 a gas pipeline was extended to the Dairy to allow direct injection of the finished biogas into the regional pipeline system. The digester remained operational throughout 2023 with the exception of short downtimes of less than 5% for repairs or maintenance. During 2023, the digester produced 96 million cubic feet of low-carbon biogas for alternative fuels production.

Following initial treatment in the digester, the Dairy continues to treat its manure using a DAF unit and the NDN system. Maintenance of the NDN system was completed in early 2023.

3.6.3.2 Operations and Maintenance of Existing Lined Lagoons

In 2023, D&A Dairy and George DeRuyter & Son Dairy performed routine weekly inspections of the seven manure storage lagoons as described in the *Uniform Lagoon Operations, Maintenance, and Monitoring Plan – Bosma and DeRuyter Dairies* (Anchor QEA 2020). The routine inspections include visual inspections of the following:

- The liner for evidence of slumps of bulges
- Damage to the liner (e.g., holes, tears, or damaged seams)
- The perimeter of the lagoon, looking specifically for signs of access from animals or workers, damage to fencing/barrier, presence of trees or vegetation, wind damage, or rodent activity
- The embankments, looking for signs of erosion
- Inlet and outlet piping to check for obstructions or damage
- Accumulation of solids in the lagoon

- The agitation equipment to ensure that it is properly secured with the tethered lines and positioned away from the side slopes and bottom of the lagoon
- Gas venting piping to check for obstructions or damage

Records of the weekly inspections conducted in 2023 are included in Appendix B.

During 2023, the Dairy also completed biennial electronic leak detection surveys at three of the seven existing lined lagoons (the four remaining lagoons are not due for a leak detection survey until 2024). The results for these surveys are contained in Appendix B:

- D&A Lagoon No. 1: Six signals were detected indicating punctures or other liner damage in the above-water portions of the lagoon. One leak signal was detected in the below-water portion of the lagoon. Repairs will be enacted during the next scheduled drawdown of the lagoon.
- George DeRuyter & Son Dairy Lagoon No. 2: Five small punctures were detected in the above-water portions of the lagoon. No leaks were detected in the below-water portions of the lagoon. Repairs will be scheduled to coincide with repairs to D&A Consolidated Lagoon No. 1.
- George DeRuyter & Son Dairy Lagoon No. 3: Six signals were detected indicating punctures or other liner damage in the above-water portions of the lagoon. No leaks were detected in the below-water portions of the lagoon. Repairs will be scheduled to coincide with repairs to D&A Consolidated Lagoon No. 1.

3.6.3.3 Submittals and Approvals

In 2023, there were no submittals or approvals of George DeRuyter & Son/D&A Dairies documents related to lagoon activities.

4 Groundwater Monitoring Program

The Consent Order requires 8 years of quarterly groundwater monitoring, which was completed in Second Quarter 2021. Under the Consent Order, this 8-year monitoring period is to be followed by data evaluation and a formal determination of next steps. This data evaluation process is in progress.

Pending completion of the data evaluation process and definition of next steps under the Consent Order, EPA and the Dairies exchanged correspondence regarding the value of conducting continued groundwater monitoring. The Dairies made a written proposal to conduct ongoing monitoring in a letter to EPA dated October 4, 2021, and in follow-up letters dated November 11, 2021, and December 10, 2021. In the December 10, 2021, letter, the Dairies informed EPA that they planned to voluntarily perform groundwater monitoring for the immediate future.

EPA responded to the proposal from the Dairies for continued voluntary groundwater monitoring on January 25, 2022. In that letter, EPA stated that the Consent Order did not require continued groundwater monitoring but that it was in line with the goals of the Consent Order. Therefore, beginning in Fourth Quarter 2021, voluntary groundwater monitoring was commenced with continued groundwater elevation monitoring at all 26 site wells and groundwater sampling for nitrate only. Due to the ongoing negotiations at that time, no groundwater monitoring was conducted in Third Quarter 2021. Voluntary groundwater monitoring has been conducted quarterly since Fourth Quarter 2021.

The monitoring well network at the Dairies (Figure 1 and Table 3) consists of 26 monitoring wells screened in the surficial aquifer. Most of the wells (23 wells) are screened across the water table. The remaining wells (3 wells) are deeper wells that are paired with water table wells.

Figures 4 and 5 summarize potential on-site sources of nitrogen at the Dairies and identify key transport mechanisms and exposure pathways. The monitoring well network serves as a tool to evaluate how the aquifer is responding to actions taken to control these potential sources and transport pathways. The groundwater monitoring data are used by EPA to supplement and verify existing information at the Dairies.

A list of the wells in the network and well construction data are shown in Table 3 and are detailed as follows:

- Seven of the wells were installed by EPA in 2012 (EPA wells; identified as DC-01, DC-03, DC-04, DC-05, DC-07, DC-09, and DC-14).
- The remaining 19 wells were installed by the Dairies in 2013 (Consent Order wells; identified as YVD-02, YVD-03, YVD-04, YVD-05, YVD-06, YVD-07, YVD-08, YVD-09, YVD-10, YVD-11, YVD-12, YVD-13, YVD-14R, YVD-15, YVD-16, YVD-17, YVD-18, DC-03D, and DC-05D), except for well YVD-14R, which is a replacement for well YVD-14, originally installed by the Dairies in 2013.

4.1 Groundwater Monitoring Quality Assurance Project Plan

In 2023, groundwater monitoring was conducted according to the updated *Groundwater Monitoring QAPP* (Anchor QEA 2018a), which was conditionally approved by EPA on February 28, 2018.

According to the 2018 *Groundwater Monitoring QAPP* (Anchor QEA 2018a), 16 of the Consent Order wells are monitored quarterly and 10 are monitored annually to assess nitrate concentrations and groundwater chemistry in the surficial aquifer. As of Third Quarter 2019, upgradient monitoring well YVD-02 was moved from the annual schedule to the quarterly monitoring schedule due to elevated nitrate concentrations detected in that well in Second Quarter 2019. However, due to the redirecting of an irrigation ditch into underground piping, YVD-02 has been dry since Third Quarter 2020, and no groundwater samples could be collected in 2023. Beginning in Third Quarter 2020, quarterly sampling was resumed at well DC-07 due to elevated nitrate concentrations detected in that well during Second Quarter 2020.

4.2 Well Installation and Maintenance

In 2023, no groundwater monitoring well installations, repairs, or replacements were required.

Monitoring well YVD-02 was dry during all four quarters of 2023. YVD-02 is screened in a shallow basalt layer and is located just downgradient of a former irrigation canal. Groundwater elevations decreased in this well following replacement of the open canal with an enclosed irrigation pipeline. The well subsequently became dry and has not had sufficient water to allow sampling since Second Quarter 2020. YVD-02 is checked during each quarterly monitoring event and will continue to be sampled if sufficient water is present.

4.2.1 Dedicated Bladder Pumps

In 2017, dedicated bladder pumps were installed in each groundwater well. During 2023, all bladder pumps remained operational, and no changes to the sampling methodology were required.

4.2.2 Monitoring Well Pressure Transducers

Non-vented Solinst Levelogger Junior Edge pressure transducers were initially installed in six wells (YVD-03, YVD-08, YVD-11, DC-03, DC-05, and DC-05D), along with a Solinst Barologger Edge barometric pressure transducer deployed at well YVD-08 to compensate water levels for atmospheric pressure. However, the transducers are no longer operational due to equipment failures.

Transducers recorded water levels in hourly increments from 12:00 p.m. on October 15, 2013, through 8:00 a.m. on December 7, 2020. Beginning at 8:45 a.m. on December 7, 2020, the transducers began recording water levels in 15-minute increments to provide more accurate calibration with manual depth-to-water measurements. During data downloads, depths to water in wells were manually measured using an electronic water level meter.

Whether ongoing transducer data will be required in the future has not been resolved with EPA. As of December 2023, none of the transducers remain operational.

4.3 Quarterly Groundwater Monitoring Data Reports

During 2023, quarterly groundwater monitoring events were conducted as follows:

- First Quarter 2023 – March 5 to March 6, 2023
- Second Quarter 2023 – June 4 and June 19 to June 21, 2023
- Third Quarter 2023 – September 10 to September 11, 2023
- Fourth Quarter 2023 – December 3 to December 7, 2023

In 2023, quarterly groundwater monitoring data reports were submitted to EPA as follows:

- *First Quarter 2023 Groundwater Monitoring Data Report* (Anchor QEA 2023a) – submitted May 5, 2023
- *Second Quarter 2023 Groundwater Monitoring Data Report* (Anchor QEA 2023b) – submitted August 21, 2023
- *Third Quarter 2023 Groundwater Monitoring Data Report* (Anchor QEA 2023c) – submitted November 9, 2023
- *Fourth Quarter 2023 Groundwater Monitoring Data Report* (Anchor QEA 2024) – submitted February 5, 2024

The quarterly groundwater monitoring data reports are included in Appendix C. Current and historical data are presented in the tables and figures of the quarterly reports and are also summarized in Section 4.4.

4.4 Summary of Findings

Historical groundwater chemistry data are presented in Table 4. Groundwater nitrate concentrations detected in 2023 for each well are presented in Figure 6. Historical groundwater elevations in the surficial aquifer from the beginning of monitoring in 2013 through 2023 are listed in Table 5. Surficial aquifer groundwater elevation contour maps for the four quarters in 2023 are presented in Figures 7a through 7d. Time-series trend plots of nitrate concentrations in groundwater from the beginning of monitoring in 2013 through Fourth Quarter 2023 are presented in Figures 8 through 12.

4.4.1 Groundwater Nitrate Monitoring

Results of the 2023 groundwater nitrate monitoring include the following:

- Nitrate concentrations are currently below the MCL in 10 of the 23 wells screened across the water table.
- Nitrate concentrations in water table well DC-03, which historically had the highest groundwater nitrate concentrations in the groundwater monitoring network, have decreased since

First Quarter 2022 to a historically low concentration of 137 mg/L in Fourth Quarter 2023. The five historically low concentrations have been detected in DC-03 in the previous five quarters.

- Nitrate concentrations detected in 2023 in well DC-07 were below the MCL in all four quarters in 2023. Nitrate concentrations in well DC-07 were historically below the MCL between 2013 and Second Quarter 2020. From Second Quarter 2020 to Third Quarter 2022, the MCL was exceeded 7 times out of 10 monitoring events. Since Third Quarter 2022, the nitrate concentration has been below the MCL for five consecutive quarters.
- Nitrate concentrations detected in 2023 in well DC-14 decreased consistently since reaching a maximum value of 57.4 mg/L in Second Quarter 2022. The decrease has been continuous from quarter to quarter, from 52.0 mg/L in First Quarter 2023 to 43.0 mg/L in Fourth Quarter 2023.
- Nitrate concentrations have been gradually increasing at well YVD-09 from a low of 42.8 mg/L in Fourth Quarter 2016 to a historical high of 66.9 mg/L in Fourth Quarter 2023.
- Nitrate concentrations have been gradually increasing at well YVD-13 since Third Quarter 2017 after 4 years of generally stable concentrations (2013 to 2017). Concentrations have steadily increased from 23.2 mg/L in Third Quarter 2017 to a historically high concentration of 38.0 mg/L in Fourth Quarter 2023.
- Nitrate concentrations had been increasing in well YVD-08 but reached an apparent maximum during First Quarter 2021. Since that time, the groundwater nitrate concentrations have begun to decrease, but that decrease is not yet statistically significant.
- Nitrate concentrations in four of the five northern downgradient wells (DC-09, YVD-05, YVD-06, and YVD-07) and three of the four upgradient wells (DC-01, YVD-03, and YVD-04) have remained below the nitrate MCL since Third Quarter 2016 and Second Quarter 2015, respectively. The fourth upgradient well (YVD-02; completed in perched water above a shallow bedrock layer) has been dry since late 2020. This well ran dry following the piping of an adjacent irrigation return water canal that eliminated the source of the perched water in this area.
- Nitrate concentrations have been consistently below the nitrate MCL in downgradient well YVD-17 since the beginning of the monitoring program.

4.4.2 Groundwater Nitrate Concentration Trend Analysis

An analysis of groundwater nitrate observations from 2013 through 2023 was conducted. This included several steps. First, the changes in the groundwater plume characteristics were evaluated using isoconcentration contour maps. Figure 13a illustrates the maximum concentrations and extent of the nitrate plume based on the highest running average (average of four consecutive monitoring events). Figure 13b then illustrates the most frequent running average nitrate concentration (average of the four 2023 monitoring events).

The second analysis method included groundwater trend analysis. The trend analysis was conducted in Pro UCL using the Mann-Kendall trend analysis method to assess whether the apparent trends are statistically significant. This is a non-parametric method widely used for groundwater trend analysis. Based on the observed nitrate concentration patterns in each well the trend analysis was conducted in one of two ways. Where there was no apparent change in groundwater trend direction, the analysis was performed using all available data. In cases where there was an apparent change in groundwater trend direction (i.e., an increasing trend followed by decreasing trend), the trend analysis was performed using all data from the apparent point of trend reversal. Table 6 summarizes the data used in the analysis and the trend observations for each well. A summary of current nitrate trends is presented graphically in Figure 14. Nitrate concentration trend plots of the Consent Order wells are presented in Figures 15a through 15c for the central, eastern, and western wells, respectively.

Results of the trend analysis indicate the following trends in nitrate concentrations as of year-end 2023:

- **Wells below the MCL:** Ten of the 23 wells screened across the water table have nitrate concentrations below the MCL:
  - Upgradient wells (4): Three upgradient wells (DC-01, YVD-03, and YVD-04) exhibited nitrate concentrations consistently below the MCL or were dry during the most recent four sampling events. The fourth upgradient well (YVD-02) has been dry for the past 13 monitoring events. None of the upgradient wells exhibited an increasing trend.
  - Northerly downgradient wells (4): Four wells located on the Dairies (YVD-05, YVD-06, YVD-07, and DC-09) have exhibited nitrate concentrations consistently below the MCL during the most recent four sampling events. None of the upgradient wells exhibited an increasing trend.
  - Central downgradient wells (2): Two wells located on the southern portion of the Dairies (DC-07 and YVD-17) have exhibited nitrate concentrations consistently below the MCL during the most recent four sampling events.
- **Downgradient water table wells (13):** Decreasing nitrate concentrations have been observed in 11 of the remaining 13 wells, with statistically significant decreasing trends in 7 wells. Increasing trends were only observed in 2 wells:
  - Seven downgradient wells exhibit decreasing trends that are statistically significant (DC-03, DC-04, DC-05, DC-14, YVD-10, YVD-14R, and YVD-15). All of these wells had previously exhibited increasing trends.
  - Four downgradient wells (YVD-08, YVD-11, YVD-12, and YVD-16) exhibit decreasing nitrate concentrations (observed decreases in running average nitrate concentrations have ranged from 5% to 16%), but the downward trends are not statistically significant. The trends for these wells are listed as "flat" in Table 6 and Figure 14. YVD-08 previously exhibited an increasing trend. This trend stabilized following reduction of application field nitrogen concentrations and lining of nearby manure lagoons.

  - Two downgradient water table wells exhibit increasing trends (YVD-09 and YVD-13). YVD-13 is located in an area with a thick overlying silt layer. It may be responding with a lag to higher groundwater nitrate concentrations in adjacent areas to the east.
- **Deeper wells (3):** Two of the three deeper wells exhibit stable trends (DC-03D and DC-05D). Concentrations in YVD-18 exhibit an increasing trend, similar to co-located water table well YVD-13.

4.4.3 Site Hydrogeology

4.4.3.1 Groundwater Flow Direction and Horizontal Hydraulic Gradients

Groundwater in the surficial aquifer flows in a northeast to southwest direction with little seasonal change in hydraulic gradient. In 2023, the average hydraulic gradient from the topographically higher areas in the northern part of the site to the southern part of the site was 0.0127 (foot per foot), with an average of 0.0262 in the topographically higher area upgradient of the Dairies, 0.0109 in the central area of the site, and 0.0041 in the topographically lower area downgradient of the Dairies.

4.4.3.2 Vertical Hydraulic Gradients

Vertical gradients in 2023 at the three shallow/deep well pairs (DC-03/DC-03D, DC-05/DC-05D, and YVD-13/YVD-18) were consistently upward at well pairs DC-03/DC-03D and DC-05/DC-05D and downward three out of four quarters at well pair YVD-13/YVD-18. The vertical gradients have been more variable in the previous years, with sporadic fluctuations between upward and downward vertical gradients at all three well pairs. The variable vertical gradients may be caused by periodic pumping cycles from domestic and irrigation wells in the vicinity.

4.4.3.3 Seasonal Groundwater Elevation Patterns

The hydrographs for many of the monitoring wells show a seasonal pattern of water level increases and decreases. For example, the water level in monitoring well YVD-02 historically increased about 12 feet from first quarter to second quarter before an adjacent irrigation ditch was converted to a closed pipe, after which the seasonal pattern became less pronounced, and the well eventually went dry.

Another example of seasonal water level fluctuation is observed in well YVD-17, which is located adjacent to the large, unlined Southside irrigation canal run by the Sunnyside Valley Irrigation District. According to the District fact sheet, irrigation usually runs from April 1 through October 20 with canal priming operations beginning in mid-March. The water elevation in YVD-17 varies seasonally by about 6 feet. The lowest water level of each year has consistently occurred in the first quarter (approximately April 1), and the highest water level of each year has consistently occurred in the third quarter (approximately October 1). This suggests that the travel time of water from the flowing irrigation canal to the relatively shallow drinking water aquifer at YVD-17 is likely in the range of days to weeks.

EPA has concluded that the seasonal fluctuations observed at monitoring wells indicate that percolation of water from the land surface to the aquifer in the vicinity of the Dairies can and does occur in a range of days to months. The time of travel depends on many factors including the soil type, existing amount of water in the soil, the duration and amount of water, evapotranspiration, and depth to the water table. The percolating water could originate from surface water such as a canal or pond, excess irrigation water from a field, an earthen lagoon, precipitation, or some other source. The groundwater elevation seasonal patterns for each monitoring well are shown in the figure included in Appendix D and in the following table:

Monitoring Well ID	Clear Seasonal Pattern? (Y/N)	Well Depth from Ground Surface to Midpoint of Screen (feet)	Highest Groundwater Elevation in 3Q (Fall) and Lowest in 1Q (Spring)	Highest Groundwater Elevation in 4Q (Winter) and Lowest in 2Q (Summer)	Highest Groundwater Elevation in 1Q (Spring) and Lowest in 3Q (Fall)
YVD-17	Y	38	X		
DC-04	Y	40	X		
DC-07	Y	49		X	
DC-03	Y	73	X		
DC-05	Y	74		X	
YVD-14R	Y	81		X	
YVD-10	Y	93			X
YVD-15	Y	95		X	
YVD-11	N	107			
DC-03D	Y	111	X		
YVD-09	N	112			
YVD-16	Y	112			X
DC-05D	Y	122		X	
YVD-13	Y	131		X	
DC-14	N	139			
YVD-12	Y	141			X
DC-01	N	150			
YVD-07	Y	158			X
YVD-06	Y	159			X
YVD-05	Y	172			X
YVD-08	Y	172			X
YVD-18	Y	175		X	
DC-09	Y	184			X
YVD-03	Y	190			X
YVD-04	Y	235			X

5 Actions to Ensure Effective Nutrient Management

Section III.F.1 and Section III.F.2 of the SOW describe immediate nitrate source control actions. Per Section III.F.1, each Dairy must submit a Dairy Facility Application Field Management Plan (AFMP) to EPA and conduct pre-plant and post-harvest soil sampling, with the goal of reducing the soil nitrate level to below 45 parts per million (ppm) at the 2-foot depth. Per Section III.F.2, each Dairy must submit an Irrigation Water Management Plan (IWMP) to EPA and install flow meters and moisture sensors with the goal of minimizing water movement below the root zone.

Per Section III.F.1 of the SOW, pre-plant and post-harvest soil sampling is required for application fields for the period of fall 2013 through spring 2022 ("six months and twelve months after the Effective Date of the Consent Order and within a month of the anniversaries of those dates for eight years"). Since spring 2022, the Dairies conducted voluntary monitoring of application fields consistent with requirements outlined in the Ecology CAFO General Permit, using the same soil testing procedures as previously performed under the Consent Order. This annual report summarizes data collected under the CAFO permit monitoring.

As of fall 2023, 97% of the 34 application fields at the three Dairies complied with the 45-ppm target for the 2-foot depth interval (12 to 24 inches). Spring and fall nitrate concentrations in all application fields at Cow Palace Dairy and Liberty/H&S Bosma Dairies remained below the 45-ppm target at the 2-foot depth interval (12 to 24 inches). Spring and fall nitrate concentrations were below the 45-ppm target in all George DeRuyter & Son/D&A Dairies fields except in field GDS-SU04 (51 ppm nitrate; Figure 16).

During 2023, many of the soil moisture sensors installed in the manure application fields were repaired and upgraded to address operational problems.

5.1 Application Fields

The use of an agronomic rate to guide nutrient applications was the primary management tool used to achieve the goal of reducing nitrate at the 2-foot depth in each application field to less than 45 ppm. To calculate an agronomic rate, dairy nutrient sources are evaluated (through sampling and analysis procedures described in the updated *Dairy Facility AFMP* [Anchor QEA 2018b] or equivalent sampling performed under CAFO permit requirements) for total nitrogen, which principally includes ammonium nitrogen, nitrate nitrogen, and organic nitrogen. Other potential sources of nutrients, such as organic matter, irrigation water, crop residue, and past manure applications, are established through sampling and calculation and accounted for in the calculation of an agronomic rate.

Following application, only a portion of the nitrogen measured in the dairy nutrient sources is available to the crop during the growing season. Available nitrogen is calculated using the nutrient source parameters. Residual soil nitrogen is measured by soil sampling and is a critical component of

an agronomic rate. Due to variation in crop physiology and rooting depth, not all of the measured residual nitrogen within the soil will be available to the growing crop over the season. Therefore, some of the nitrogen is considered to be "positionally unavailable" or "not accessible."

As the crop develops, in-season adjustments are sometimes made using tissue samples (petioles) or soil samples. These samples can be taken to assess if current nutrient availability will be sufficient to meet crop needs to finish out the crop. If it is determined that additional nitrogen will be required to meet crop demand, then the initial agronomic rate is adjusted. An agronomic rate should not be considered to be an absolute maximum or minimum, as in-season dynamics can change. However, if applications are made outside of these parameters, then documentation of the reasons for the change in rate are required.

Manure nutrient contents measured for various liquid and solid manure sources for pre-plant and post-harvest are summarized for each Dairy in Tables 7a to 7d (Cow Palace Dairy), Tables 8a to 8d (Liberty/H&S Bosma Dairies), and Tables 9a to 9d (George DeRuyter & Son/D&A Dairies). Other nutrient management activities and results are further described for each Dairy in Sections 5.3, 5.4, and 5.5.

5.2 Irrigation Water Management

Section III.F.2 of the SOW requires that each Dairy must submit an IWMP to EPA and install flow meters and moisture sensors with the goal of minimizing water movement below the root zone.

As described in the IWMPs, at each Dairy, a system of data loggers and moisture sensors was installed within each field to help guide irrigation water applications with the goal of reducing the potential for the movement of water below the crop root zone. For this purpose, the crop root zone was conservatively assumed to be 2 feet deep. Figure 17 depicts an IWMP Conceptual Site Model (IES 2015a, 2015b, 2015c) that provides a simplified and general depiction of the forces and components involved within irrigated fields. However, it does not represent all the forces that can act on irrigation water within an irrigated system.

The Consent Order requires at least two soil moisture monitoring locations in each of the Dairies' 34 application fields. Each monitoring location, or "station," includes three sensors at different soil depths. Most fields have two sensor stations, and some have three. There are currently 73 moisture sensor stations, including at least two sensors per application field. Table 10 summarizes the network of 73 irrigation sensor stations.

5.2.1 Sensor Installation and Maintenance

The maximum amount of water that is held in soil against the pull of gravity is referred to as the "field capacity" (NRCS 2017). The results of the field capacity testing and soil moisture monitoring

station installation is described in the field capacity soil testing reports for irrigation water management (IES 2015a, 2015b, 2015c).

Agrimanagement completed testing in September and October 2014 to establish field capacities of application field soils. Pessl iMetos data loggers with Decagon[3] moisture sensors were installed during November 2014. Separate sensors were installed at 1 foot below ground surface (bgs), 2 feet bgs, and 3 feet bgs. The moisture sensors measure the volumetric water content (VWC; water volume divided by soil volume). As shown on the example provided in Figure 18, the VWC at 1 foot bgs is generally more variable during precipitation or irrigation compared to the VWC at 2 feet and 3 feet bgs. The VWC at 2 feet and 3 feet bgs is more gradual in response to the rainfall or irrigation event.

Data are collected from the moisture sensors on an hourly basis and transmitted up to four times per day via cell modem to a web application. These data are evaluated once per week, and field-specific recommendations are provided. In the event field capacity is exceeded at the 3-foot depth, the web application sends a text notification to the professional irrigation consultant (Agrimanagement) and to farm managers to notify them that field capacity has been exceeded.

The Dairies and Agrimanagement continue to conduct maintenance and repairs as necessary to keep the 73 irrigation sensors operational.

5.2.2 Irrigation Monitoring Results

During 2023, the irrigation season extended from early April through mid-October. The weather experienced during the 2023 irrigation season was characterized by average temperatures for most of April. May, June, and July were average to below average in temperature, while August was slightly above average. September and October were more typical. While April spring rains resulted in delayed crop development, which required lower irrigation rates, the remainder of the summer was below average for precipitation. October saw a return to average precipitation.

The Consent Order requires at least two moisture monitoring stations in each of the 34 fields (some fields have three). As noted in Section 5.2.1, some moisture sensor stations were undergoing repairs and replacement during the irrigation season. Table 10 summarizes information regarding each sensor location, including instances when exceedances of field capacity were measured at the 3-foot soil depth. Observations include the following:

- All 34 application fields had at least one operable sensor station for all or part of the irrigation season.
- Field capacity exceedances at the 3-foot soil depth per sensor were noted at a frequency of 1.6% across entire 2023 irrigation season for all Dairies combined (i.e., 98.4% of the measurements indicated soil moisture levels were maintained below field capacity at the

[3] Decagon was bought by Meter Group, which all replacement sensors are now purchased from.

3-foot soil depth). Several of these exceedances appeared to be related to wet spring soils that were unrelated to irrigation events.

The 2023 moisture sensor data are described in individual season summary site reports for each field and are included in Appendix E.[4,5,6,7]

5.3 Cow Palace Dairy Application Fields

In 2023, pre-plant and post-harvest soil sampling was conducted by Agrimanagement at the seven application fields associated with Cow Palace Dairy from May 18 to May 26, 2023 (pre-plant), and from September 2 to October 18, 2023 (post-harvest). Liquid and solid manure samples were collected on April 26, 2023 (pre-plant), and September 12, 2023 (post-harvest). A summary of 2023 pre-plant and post-harvest data is provided in Table 11. For the entirety of the 2023 season, nitrate concentrations in all application fields associated with Cow Palace Dairy were below 45 ppm at the 2-foot depth.

Cow Palace Dairy manure nutrient concentrations for total nitrogen (N), total ammonium (NH4), total phosphorus (P), and total potassium (K) from 2013 to 2023 are provided in Tables 7a, 7b, 7c, and 7d.

5.3.1 Soil Nitrate Level Summary

In 2023, based on soil sampling results collected, nitrate concentrations at the 2-foot depth interval were all below 45 ppm for both the pre-plant and post-harvest samplings.

The number of application fields with nitrate levels exceeding 45 ppm in the second foot from 2013 to 2023 is depicted in Figure 19. Average post-harvest soil nitrate concentrations measured in the seven application fields associated with Cow Palace Dairy have generally decreased since 2013 (Figure 20). From fall 2013 to fall 2023, nitrate concentrations have decreased by 58% in the first foot, 83% in the second foot, and 87% in the third foot. As discussed in Section 5.1, residual soil nitrogen measured in each field is an important element in the development of the agronomic rate for that field.

The 2023 season was the eighth full year where the nitrate concentrations in all seven application fields associated with Cow Palace Dairy were consistently below 45 ppm at the 2-foot depth interval.

[4] In the line graph of certain application field season reports, the line between the green shading and the blue shading is field capacity at the third foot (or the green is the favorable zone, red is below favorable, and blue is above favorable).
[5] In the line graph of certain application field season reports, the top line of the gray shading is field capacity at the third foot (or the gray is the favorable zone, above the gray is below favorable, and under the gray is above favorable).
[6] In the bar graph of certain application field season reports, the blue data bars represent precipitation. Overlapping data bars may appear darker (blue versus dark blue). To clarify, all blue bars represent precipitation.
[7] Line graphs in certain application field season reports show up and down movement due to using old sensors with new loggers. This has been discontinued, and only new sensors will be used with new loggers.

5.3.2 Application Field Management

In 2023, in addition to agronomic rate, the following management tools and strategies were used toward achieving soil nitrate concentrations below 45 ppm at the 2-foot depth interval in application fields associated with Cow Palace Dairy:

- Improved application timing to better coincide with crop nutrient uptake
- In-season tissue and soil sampling to evaluate crop nutrient uptake progress

Overall, manure applications were well controlled, and as discussed in Section 5.3.1. All field nitrogen applications for 2023 were within the ranges recommended by Agrimanagement. 100% of the Cow Palace fields are in the "Low Risk" category (indicating a field with less than 15 ppm nitrate at the 2-foot depth interval) as defined in Washington's current CAFO permit.

5.3.3 Field Moisture Management

At Cow Palace Dairy there are a total of 14 moisture sensor locations in seven fields. In 2023, as discussed in Section 5.2.1, malfunctioning moisture sensor stations were repaired, replaced, and upgraded. The following is a summary based on available data:

- One field (CP-SU06) had no field capacity exceedances observed at the 3-foot soil depth through the entire 2023 irrigation season.
- Three fields (CP-SU02, CP-SU03, and CP-SU04A) had one or two field capacity exceedances observed at the 3-foot soil depth through the entire 2023 irrigation season.
- Three fields (CP-SU01, CP-SU04B, and CP-SU05) had six or more field capacity exceedances observed at the 3-foot soil depth through the entire 2023 irrigation season.
- Total field capacity exceedances observed at the 3-foot depth per sensor occurred at a frequency of 2.0% over the entire 2023 irrigation season (Table 10).

In response to the field capacity exceedances noted, water application to these fields was adjusted by turning the water off or by lengthening the time between planned applications until moisture levels decreased below field capacity. These adjustments resolved the issue.

5.4 Liberty/H&S Bosma Dairies Application Fields

In 2023, pre-plant and post-harvest soil sampling was conducted by Agrimanagement at the 13 application fields associated with Liberty/H&S Bosma Dairies from May 10 to June 22, 2023 (pre-plant), and from September 5 to November 2, 2023 (post-harvest). Liquid and solid manure samples were collected on April 26, 2023 (pre-plant), and September 12, 2023 (post-harvest). A summary of 2023 pre-plant and post-harvest data is provided in Table 12.

Liberty Dairy manure nutrient concentrations for total N, total NH4, total P, and total K from 2013 to 2023 are provided in Tables 8a, 8b, 8c, and 8d.

5.4.1 Soil Nitrate Level Summary

The number of application fields with nitrate levels exceeding 45 ppm in the second foot from 2013 to 2022 is depicted in Figure 19. Average post-harvest soil nitrate concentrations measured in the 13 application fields associated with Liberty/H&S Bosma Dairies decreased substantially since 2013 (Figure 21). From fall 2013 to fall 2023, nitrate concentrations have decreased by 60% in the first foot, 71% in the second foot, and 70% in the third foot. As discussed in Section 5.1, residual soil nitrogen measured in each field is an important element in the development of the agronomic rate for that field. Since fall 2022, nitrate concentrations in all 13 application fields associated with Liberty/H&S Bosma Dairies have been below 45 ppm at the 2-foot depth interval.

5.4.2 Application Field Management

In 2023, in addition to agronomic rate, the following management tools and strategies were used toward achieving and maintaining soil nitrate concentrations below 45 ppm at the 2-foot depth interval in application fields associated with Liberty/H&S Bosma Dairies:

- Improved application timing to better coincide with crop nutrient uptake
- In-season tissue and soil sampling to evaluate crop nutrient uptake progress
- Rotation changes to provide application flexibility as well as increased nutrient uptake

Overall, manure applications were well controlled, and soil sample concentrations for nitrate have continued to decrease or be maintained. As of fall 2023, 58% (7 of 12) of the Liberty/H&S Bosma Dairy fields are in the "Low Risk" category (indicating a field with less than 15 ppm nitrate at the 2-foot depth interval) as defined in Washington's current CAFO permit. Four fields (33%) were in the "Moderate Risk" (15 to 30 ppm) category, and two fields (17%) were in the "High Risk" (31 to 45 ppm) category.

5.4.3 Field Moisture Management

At Liberty/H&S Bosma Dairy, there are a total of 26 sensor locations in 13 fields. In 2023, as discussed in Section 5.2.1, malfunctioning moisture sensor stations were repaired, replaced, and upgraded. The following is a summary based on available data for the 2023 irrigation season:

- Five fields (LD-SU02, LD-SU03, LD-SU04, LD-SU09, and LD-SU10) had no field capacity exceedances observed at the 3-foot soil depth through the entire 2023 irrigation season.
- Five fields (LD-SU05, LD-SU06, LD-SU07, LD-SU14, and LD-SU16) had one or two field capacity exceedances observed at the 3-foot soil depth through the entire 2023 irrigation season.
- Three fields (LD-SU08 N, LD-SU08 S, and LD-SU17) had six or more field capacity exceedances observed at the 3-foot soil depth through the entire 2023 irrigation season.
- Total field capacity exceedances observed at the 3-foot depth per sensor occurred at a frequency of 0.9% over the entire 2023 irrigation season (Table 10).

In response to the field capacity exceedances noted, water application to these fields was adjusted by turning the water off or by lengthening the time between planned applications until moisture levels decreased below field capacity. These adjustments resolved the issue.

5.5 George DeRuyter & Son/D&A Dairies Application Fields

In 2023, pre-plant and post-harvest soil sampling was conducted by Agrimanagement at the 14 application fields associated with George DeRuyter & Son/D&A Dairies, from May 10 to May 24, 2023 (pre-plant), and from October 30 to November 15, 2023 (post-harvest). Liquid and solid manure samples were collected on April 26, 2023 (pre-plant), and September 12, 2023 (post-harvest). A summary of 2023 pre-plant and post-harvest data is provided in Table 13.

George DeRuyter & Son Dairy manure nutrient concentrations for total N, total NH4, total P, and total K from 2013 to 2023 are provided in Tables 9a, 9b, 9c, and 9d.

5.5.1 Soil Nitrate Level Summary

The number of application fields with nitrate levels exceeding 45 ppm in the second foot from 2013 to 2023 is depicted in Figure 19. Average post-harvest soil nitrate concentrations measured in the 14 application fields associated with George DeRuyter & Son/D&A Dairies decreased substantially since 2013 (Figure 22). From fall 2013 to fall 2023, nitrate concentrations have decreased by 73% in the first foot, 87% in the second foot, and 81% in the third foot. As discussed in Section 5.1, residual soil nitrogen measured in each field is an important element in the development of the agronomic rate for that field.

Only field GDS-SU04 exceeded the 45-ppm nitrate goal in 2023 (Figure 16). This field has been in a triticale-silage corn rotation. Spring 2022 measurements were below the 45-ppm goal but slightly exceeded the 45-ppm goal during fall 2022, measuring at 47 ppm nitrate. Agronomic adjustments were made that were expected to result in a continued downward trend in 2023, but this did not happen. This field exhibits high mineralization, which will be considered in future agronomic rate calculations. In 2024, crop rotation back to alfalfa has been recommended, which should result in 2-foot nitrate levels below 45 ppm moving forward (alfalfa is a deep-rooted crop capable of extracting nitrogen from well below the top 2 feet of the soil).

5.5.2 Application Field Management

In 2023, in addition to agronomic rate, the following management tools and strategies were used toward achieving soil nitrate concentrations below 45 ppm at the 2-foot depth interval in application fields associated with George DeRuyter & Son/D&A Dairies:

- Improved application timing to better coincide with crop nutrient uptake
- In-season tissue and soil sampling to evaluate crop nutrient uptake progress

- Rotation changes to provide application flexibility

Overall, manure applications were well controlled, and soil sample concentrations for nitrate have continued to decrease or be maintained. All field manure applications for 2023 were within the acceptable recommendation ranges. As of fall 2023, 86% (12 of 14) of the George DeRuyter & Son/D&A Dairies application fields regulated under the Consent Order are in the "Low Risk" category (indicating a field with less than 15 ppm nitrate at the 2-foot depth interval) as defined in Washington's current CAFO permit. One field (7%) was in the "Moderate Risk" (15 to 30 ppm) category, and one field (7%) was in the "Very High Risk" (more than 45 ppm) category.

5.5.3 Field Moisture Management

At George DeRuyter & Son/D&A Dairies, there are a total of 30 sensor locations in 14 fields. In 2023, as discussed in Section 5.2.1, malfunctioning moisture sensor stations were repaired, replaced, and upgraded. The following is a summary based on available data:

- Three fields (GDS-SU05, GDS-SU06, and GDS-SU07) had no field capacity exceedances observed at the 3-foot soil depth through the entire 2023 irrigation season.
- Six fields (GDS-SU02, GDS-SU04, GDS-SU10, GDS-SU11, GDS-SU12, and GDS-SU14) had one to five field capacity exceedances observed at the 3-foot soil depth through the entire 2023 irrigation season.
- Five fields (GDS-SU01, GDS-SU03, GDS-SU08, GDS-SU09, and GDS-SU13) had six or more field capacity exceedances observed at the 3-foot soil depth through the entire 2023 irrigation season.
- Total field capacity exceedances observed at the 3-foot depth per sensor occurred at a frequency of 2.1% over the entire 2023 irrigation season (Table 10).

Once exceedances were noted, water application to these fields was adjusted by turning the water off or by lengthening the time between planned applications until moisture levels decreased below field capacity.

5.6 Off-Site Transfers

In 2023, the Dairies generated and exported liquid and solid manures and composted solids consistent with requirements outlined in the Ecology CAFO General Permit. These details are described in Appendices F, G, and H. Exported manures during 2023 included the following:

- Cow Palace: Exports included 4,629,850 gallons of liquid manure and 28,483 tons of solid manure (including compost).
- Liberty/H&S Bosma Dairies: Exports included approximately 2,000,000 gallons of liquid manure and approximately 32,000 tons of solid manure (including compost).

- George DeRuyter & Son/D&A Dairies: Exports included 2,400,000 gallons of liquid manure and 19,339 tons of solid manure (including compost).

6 Other Reports, Plans, and Actions

6.1 Annual Reports

In 2023, the Dairies submitted the following document related to annual reporting:

- *2022 Annual Report* (Anchor QEA 2023d) – submitted March 3, 2023

In 2023, no documents related to annual reporting were approved by EPA.

6.2 Quality Assurance Project Plans

Per Section III.A of the SOW, the Dairies must submit to EPA a QAPP prior to commencing any monitoring, sampling, field measurements, or laboratory sample analyses.

Each QAPP is prepared in accordance with *Guidance for QAPPs* (EPA 2001) and *EPA Requirements for QAPPs* (EPA 2002), as well as applicable amendments. The project data quality objectives are developed for use in the QAPP in accordance with *Guidance on Systematic Planning Using the Data Quality Objectives Process* (EPA 2006).

In 2023, there were no updates to project QAPPs. The 2023 groundwater monitoring events, which were outside of the Consent Order requirements, were conducted with deviations from the associated QAPP (Anchor QEA 2018a) as described in Section 4.1.

6.3 Health and Safety Plan

Per Section III.B of the SOW, the Dairies must submit to EPA a health and safety plan (HASP) at least 14 days in advance of initial field work for each task.

Each HASP is compliant with the Occupational Safety and Health Act and its implementing regulations. The HASP will be updated periodically, as applicable, to address changes in work or field activities. The current HASP (Anchor QEA 2016) was submitted to EPA on September 13, 2016.

In 2023, there were no loss time injuries or recordable incidents.

6.4 Public Involvement

Per Section III.C of the SOW, the Dairies must notify EPA of their interest in participating in the public involvement process within 30 days of the effective date of the Consent Order. On April 18, 2013, the Dairies notified EPA of their interest in participating in the public involvement process.

In 2023, no public involvement activities were performed.

7 References

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EPA Letter 294. EPA, 2022b. Letter to: Mark Larsen, Anchor QEA. Regarding: H&S Bosma Dairy Lagoon Nos. 1, 2, and 3 Interim Abandonment Plan, Administrative Order on Consent ("Consent Order"), Docket No. SDWA-10-2013-0080, Yakima Valley Dairies, Washington. December 9, 2022.

EPA Letter 295. EPA, 2022c. Letter to: Mark Larsen, Anchor QEA. Regarding: Approval with Modification of Bosma Lagoons 1 2 and 3 Interim Containment Actions Plan, Administrative Order on Consent ("Consent Order"), Docket No. SDWA-10-2013-0080, Yakima Valley Dairies, Washington. December 21, 2022.

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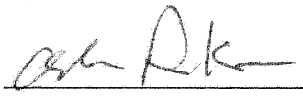
8 Certifications

Cow Palace Dairy Certification

I certify under the penalty of law that this document and attachments were prepared by me or under my direction or supervision in accordance with a system designed to assure that qualified personnel gathered and evaluated the information submitted. Based on my inquiry of any and persons directly responsible for gathering and analyzing the information obtained, I certify that the information contained in or accompanying this submittal is to the best of my knowledge and belief, true, accurate, and complete. As to those identified portion(s) of this submittal for which I cannot personally verify the accuracy, I certify that this submittal and attachments were prepared in accordance with procedures designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those directly responsible for gathering the information, or the immediate supervisor of such person(s), the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

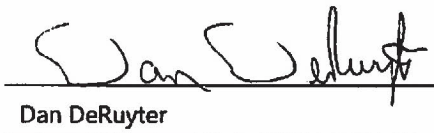
Cow Palace, LLC

Signature	
Name	Adam Dolsen
Title	Member
Date	2-27-24

George DeRuyter & Son Dairy, D&A Dairy, and George & Margaret Certification

I certify under the penalty of law that this document and attachments were prepared by me or under my direction or supervision in accordance with a system designed to assure that qualified personnel gathered and evaluated the information submitted. Based on my inquiry of any and persons directly responsible for gathering and analyzing the information obtained, I certify that the information contained in or accompanying this submittal is to the best of my knowledge and belief, true, accurate, and complete. As to those identified portion(s) of this submittal for which I cannot personally verify the accuracy, I certify that this submittal and attachments were prepared in accordance with procedures designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those directly responsible for gathering the information, or the immediate supervisor of such person(s), the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

George DeRuyter & Son Dairy, LLC, D&A Dairy, LLC (also known as D and A Dairy, L.L.C.), and George & Margaret, LLC

Signature	
Name	Dan DeRuyter
Title	Member
Date	2/26/24

Liberty Dairy Certification

I certify under the penalty of law that this document and attachments were prepared by me or under my direction or supervision in accordance with a system designed to assure that qualified personnel gathered and evaluated the information submitted. Based on my inquiry of any and persons directly responsible for gathering and analyzing the information obtained, I certify that the information contained in or accompanying this submittal is to the best of my knowledge and belief, true, accurate, and complete. As to those identified portion(s) of this submittal for which I cannot personally verify the accuracy, I certify that this submittal and attachments were prepared in accordance with procedures designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those directly responsible for gathering the information, or the immediate supervisor of such person(s), the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Liberty Dairy, LLC (and its associated dairy facility H&S Bosma Dairy)

Signature	Henry W B
Name	Henry Bosma
Title	Partner
Date	2-26-2024

Table 1
Reverse Osmosis System Maintenance Summary, 2013 to 2023

	Number of Residences
2023 Water Systems Maintenance and Service Summary	
Residences contacted[a]	79
Residences RO system maintenance	61
Residences did not respond to outreach efforts	6
Residences RO system maintenance incomplete	3
Residences vacant	2
Residences declined RO system maintenance	5
Residences received bottled water service	3

Summary of Households Contacted

Sample No. (2013)	House No.	Road	Owner of Residence	Annual Service Scheduled by	2023 Service Date	2023 Outreach, Maintenance, Service[a]
--				--	--	--
RW-1002				Cow Palace	9/21/2023	Maintenance Complete
RW-1003				Cow Palace	2/14/2023	Maintenance Complete
RW-1004				Cow Palace	2/14/2023	Maintenance Complete
RW-1005				Cow Palace	12/8/2023	Maintenance Complete
RW-1006				Cow Palace	2/14/2023	Maintenance Complete
RW-1007[b]				Bosma	6/1/2023	Maintenance Complete
RW-1010				Anchor QEA	Declined	Maintenance Declined
RW-1011				Anchor QEA	11/9/2023[o, aa]	Maintenance Complete
RW-1014				Anchor QEA	6/1/2023[o, aa]	Maintenance Complete
RW-1015				CDWP	5/25/2023	Maintenance Complete
RW-1023				Anchor QEA	5/18/2023	Maintenance Complete
RW-1040				Anchor QEA	6/1/2023	Maintenance Complete
RW-1041				Anchor QEA	9/3/2023[o, aa]	Maintenance Complete
RW-1042				Anchor QEA	5/18/2023[o]	Maintenance Complete
RW-1046[l]				--	--	--
RW-1047				Anchor QEA	6/22/2023	Maintenance Complete
RW-1051				Anchor QEA	6/1/23	Maintenance Complete
RW-1054				Anchor QEA	5/11/2023	Maintenance Complete
RW-1055A[e]				Anchor QEA	6/15/2023	Maintenance Complete
RW-1055[e]				Anchor QEA	6/15/2023	Maintenance Complete
RW-1064[l]				Anchor QEA	6/15/2023	Maintenance Complete
RW-1065				Anchor QEA	6/15/2023	Maintenance Complete
RW-1066				Anchor QEA	5/25/2023	Maintenance Complete
RW-1068				Anchor QEA	6/22/2023[o, aa]	Maintenance Complete
RW-1075				Anchor QEA	9/18/2023	Maintenance Complete
RW-1076[l]				--	--	--
RW-1082				Anchor QEA	11/21/2023[o, aa]	Maintenance Complete
RW-1083				Anchor QEA	6/22/2023	Maintenance Complete

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Table 1
Reverse Osmosis System Maintenance Summary, 2013 to 2023

Summary of Households Contacted						
Sample No. (2013)	House No.	Road	Owner of Residence	Annual Service Scheduled by	2023 Service Date	2023 Outreach, Maintenance, Service[a]
RW-1089				Anchor QEA	No response	No Response[d]
RW-1090A				Anchor QEA	No response	No Response[d]
RW-1090B				Anchor QEA	No response	No Response[d]
RW-1095				Anchor QEA	9/3/2023	Maintenance Complete
RW-1096				Anchor QEA	6/15/2023	Maintenance Complete
RW-1097				Anchor QEA	12/27/2023	Maintenance Complete
RW-1098				Anchor QEA	5/25/2023	Maintenance Complete
RW-1099				Anchor QEA	Declined	Maintenance Declined
RW-1100				Anchor QEA	6/22/2023	Maintenance Complete
RW-1101				Anchor QEA	11/9/2023	Maintenance Complete
RW-1102				Anchor QEA	5/18/2023	Maintenance Complete
RW-1103				Anchor QEA	5/11/2023	Maintenance Complete
RW-1107				Anchor QEA	11/9/2023	Maintenance Complete
RW-1108				Anchor QEA	5/25/2023	Maintenance Complete
RW-1109				Anchor QEA	5/25/2023	Maintenance Complete
RW-1112				Anchor QEA	Declined	Maintenance Declined
RW-1122				Anchor QEA	5/18/2023	Maintenance Complete
RW-1125				Anchor QEA	5/11/2023	Maintenance Complete
RW-1125x[f]				Anchor QEA	5/11/2023	Maintenance Complete
RW-1126				Anchor QEA	5/18/2023	Maintenance Complete
RW-1127				Anchor QEA	5/18/2023	Maintenance Complete
RW-1128				Anchor QEA	5/18/2023	Maintenance Complete
RW-1129				Anchor QEA	11/21/2023[o, aa]	Maintenance Complete
RW-1133				Anchor QEA	6/22/2023	Maintenance Complete
RW-1139				Anchor QEA	6/15/2023[o]	Maintenance Complete
RW-1140				Anchor QEA	6/15/2023[o]	Maintenance Complete
RW-1142[bb]				Anchor QEA	Declined	Maintenance Declined
RW-1143[bb]				Anchor QEA	Declined	Maintenance Declined
RW-1145				Anchor QEA	--[ll]	Maintenance Incomplete
RW-1149				Anchor QEA	6/22/2023	Maintenance Complete
RW-1152				Anchor QEA	--[ll]	Maintenance Incomplete
RW-1158				Anchor QEA	6/1/2023[o]	Maintenance Complete
RW-1159				Anchor QEA	5/18/2023	Maintenance Complete
RW-1162				Anchor QEA	7/13/2023	Maintenance Complete
RW-1171				Anchor QEA	6/22/2023	Maintenance Complete
RW-1174				Anchor QEA	No response	No Response[d]
RW-1201				Cow Palace	2/14/2023	Maintenance Complete
RW-1203				Anchor QEA	5/11/2023	Maintenance Complete

Redacted - PII

Table 1
Reverse Osmosis System Maintenance Summary, 2013 to 2023

Summary of Households Contacted						
Sample No. (2013)	House No.	Road	Owner of Residence	Annual Service Scheduled by	2023 Service Date	2023 Outreach, Maintenance, Service[a]
RW-1207	Redacted - PII			Cow Palace	8/1/2023	Maintenance Complete
RW-1212				Anchor QEA	Vacant	Vacant
RW-1212A				Bosma	11/9/2023	Maintenance Complete
RW-1218				Anchor QEA	6/1/2023	Maintenance Complete
RW-1220				Cow Palace	2/14/2023	Maintenance Complete
RW-1221				Anchor QEA	Vacant	Vacant
RW-1223				Anchor QEA	No response	No Response[d]
RW-1227				Anchor QEA	5/11/2023[c]	Maintenance Complete
RW-1230				Bosma	No response	No Response[d]
RW-1231				Anchor QEA	6/1/2023	Maintenance Complete
RW-1232				Anchor QEA	5/25/2023	Maintenance Complete
RW-1236[l]				--	--	--
RW-1238				Anchor QEA	--[j]	Maintenance Incomplete
RW-1239				Bosma	5/18/2023	Maintenance Complete

Summary of Households Provided with Bottled Water Service						
	House No.	Road	Owner of Residence			2023 Outreach, Maintenance, Service[a]
RW-1008	Redacted - PII				--	Bottled Water Service
RW-1014					6/1/2023	Maintenance Complete
RW-1083					6/22/2023	Bottled Water Service
RW-1100					6/22/2023	Maintenance Complete
RW-1107					11/9/2023	Maintenance Complete
RW-1124					--	Bottled Water Service
RW-1142					Declined	Maintenance Declined
RW-1238					--[j]	Maintenance Incomplete

Table 1
Reverse Osmosis System Maintenance Summary, 2013 to 2023

Notes:
a. Outreach activities included two sets of mailed postcards, at least three rounds of phone outreach, and two rounds of door-to-door site visits.
b. RW-1007 and RW-1205 are the same residence and are duplicates in the 2013 outreach list; RW-1205 is excluded from the final count of households.
c. Existing RO system was present; analytical sample not collected during 2013 outreach effort.
d. Household did not respond to any of the attempted outreach efforts.
e. RW-1055A and RW-1055 are separate houses that share one well (Table 8 in IES 2016).
f. RW-1125x not included in 2013 outreach effort; residence was built after 2013 and shares one well with RW-1125.
g. Not collected pursuant to the *Quality Assurance Project Plan, Residential Well Sampling* (Arcadis, 2013).
h. 2019 Clean Drinking Water Project Activity Summary - RO system installation date.
i. Date residence "Accepted" RO system install or RO system maintenance.
j. Address for this parcel is listed as Redacted - PII the Yakima Co. Assessors website; however, the resident states the address as Redacted - PII
k. An RO system was noted during 2013 outreach; however, an offer for maintenance received "No Response".
l. Residence not included on the 2021 outreach list because 2013 labs results were below 10 mg/L.
m. In 2020 the residence was incorrectly labeled as "not included in the 2013 outreach effort". The residences were visited in 2013 and found to have RO systems installed, but did not respond to an offer of annual maintenance
n. Residence does not exist, approximate location is outside the 1-mile downgradient AOC boundary.
o. Residences with 2013 laboratory results above 27 mg/L nitrate, and had received 2021 RO maintenance at least 4 months prior, were offered additional RO maintenance in November. Residences that did not previously respond to an offer of annual RO maintenance in 2021 were not contacted for maintenance in November.
p. Residence was sampled in 2013; however, an offer for RO system installation received "No Response".
q. Residence "Accepted" installation in 2013, but installation did not occur until a later date.
r. Declaration of Robert S. Lawrence, M.D. in Support of Plaintiffs' Motion for Summary Judgement, CARE et al v. CowPalace, LLC and Dolson Companies, ECF 213, filed 11/18/2014. See also Snyder Declaration, Ex. 26, p. 31 – 33 (lines 1-13).
s. Residence accepted installation of an RO system in 2013; however, the RO system was later found to be uninstalled.
u. The Dairy's have not officially discontinued RO maintenance at any residences within the 1-mile downgradient AOC boundary
v. No additional testing has been reported at this address
w. RO systems are maintained by Cow Palace; annual maintenance and installation dates provided by Cow Palace.
x. Property acquired by Three D Properties LLC June, 2011, residence is currently occupied, an RO system is currently installed, RO system has not been discontinued since installation; reported by Cow Palace LLC in response to EPA Letter 274
y. Property acquired by Three D Properties LLC June, 2011, residence is currently occupied, an RO system is currently installed, RO system has not been discontinued since installation; reported by Cow Palace LLC in response to EPA Letter 274
z. Property acquired by Three D Properties LLC April, 2011, residence is currently occupied, an RO system is currently installed, RO system has not been discontinued since installation; reported by Cow Palace LLC in response to EPA Letter 274
aa. Residence did not respond to an offer of additional RO maintenance in November
bb. Yakima Co. Assessors website shows two separate dwellings at the same address sharing the same well.
cc. Residence accepted an offer for RO system installation in 2013, but installation date is unknown
dd. An RO system was installed in 2018, but uninstalled due to a leaking connection. An RO system was reinstalled in 2021.
ee. Additional RO systems installed since 2013 outreach effort. Information requested as part of EPA comment letter 245
jj. A RO system maintenance appointment was scheduled with the resident, however the resident was not home on the appointment date and time. Resident did not respond to repeated efforts to reschedule the appointment.
kk. Residence was noted as Not Home during 2013 outreach efforts. A New RO system was installed in 2023, as requested by the resident.

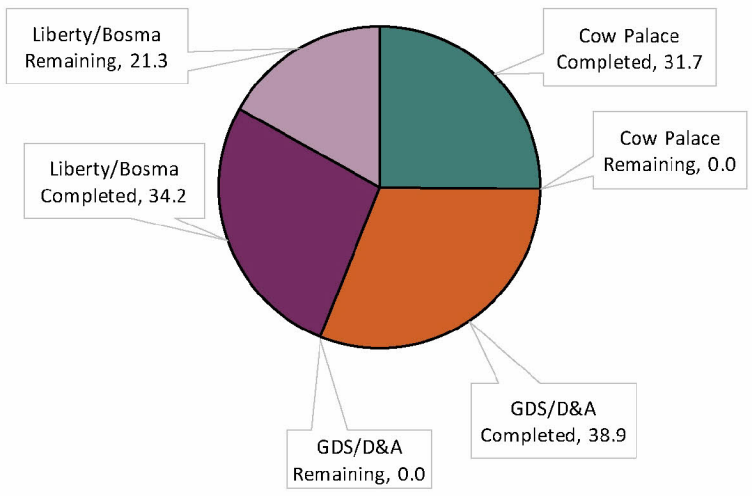
Maintenance: Annual RO system maintenance provided to residences within the 1-mile downgradient AOC boundary
MCL: maximum contaminant level
RO: reverse osmosis
Service: Weekly bottled water service delivered to residences within the 1-mile downgradient AOC boundary
Unknown: An RO system was installed after 2013, but the installation date is unknown

	Liberty/Bosma Dairy																						
										Consolidated[a]			Consolidated[a]			Consolidated[a]							
Lagoon ID	1	2	3	4a	4b	5	6	8	9	10	(11)	(13)	12	(7)	14	15	(16)	(17)	18	19	20	RWP	VTS	Total
Initial Capacity (M gal)	14.4	2.6	4.3	12.6			2.45	0.6	0.3	2.0			4.5		5.3	2.6			1.9	0.4	0.3	1.2	na	55.5
Revised Capacity (M gal)	14.4	2.6	4.3	13.1			2.72	na	na	2.6			4		6.7	2.7			1.9	na	na	1.2		56.1
2016																								
2017																								
2018																								
2019																								
2020																								
2021																								
2022																								
2023																								

	George DeRuyter Dairy								D&A Dairy					
									Consolidated[a]		Consolidated[a]			
Lagoon ID	1	2	3	4	SWCB	DIG	DAF	NDN	1	2	3	(4)	TUP	Total
Initial Capacity (M gal)	4.3	10.7	5.8	4.5	0.73	n/a	n/a	n/a	8.8		2.4		1.7	38.9
Revised Capacity (M gal)	4.3	8.4	5.8	2.1	4.42	n/a	n/a	n/a	9.7		2.58		n/a	37.3
2016														
2017														
2018														
2019														
2020														
2021														
2022														

	Cow Palace Dairy									
		Consolidated[a]			Consolidated[a]					
Lagoon ID	1	2	(3)	4	SBA	SBB	CNW	CNE	SDB	Total
Initial Capacity (M gal)	10.6	8.99		3.7	3.5		2.79	1.1	1.0	31.7
Revised Capacity (M gal)	13.8	24.3		3.7	3.5		2.79	na	0.7	48.8
2016										
2017				●						
2018										
2019										
2020										

Progress of Lagoon Lining and Abandonment by Initial Capacity (M gal)



Notes:

Designed
Scheduled work in progress
Lagoon Lined
Abandonment completed
Treatment system construction
Abandonment in progress

CNW: Catch Basin NW
CNE: Catch Basin NE
DIG: Digester
DAF: Dissolved Air Flotation Unit
NDN: Nitrification/Denitrification System
RWP: Red Water Pond
SBA: Settling Basin A
SBB: Settling Basin B
SDB: Safety Debris Basin
SWCB: Stormwater Catch Basin
TUP: Take Up Pond
VTS: Vermiculture Treatment System
● Lagoon assessed, meets applicable NRCS standards

a. Lagoon IDs show in parentheses are part of consolidated lagoons; black Lagoon IDs are the current lagoon ID number.

1. Lagoon volumes are listed based on operational volumes (with min 2 feet of freeboard). Volumes are based on survey data where available. Where survey data are not available, volumes are based on the volumes listed in the Lagoon Work Plans.

2. Completed volumes shown do not include lagoons taken out of service, emptied, and cleaned in 2021 and 2022 for abandonment since the abandonment work was not fully completed.

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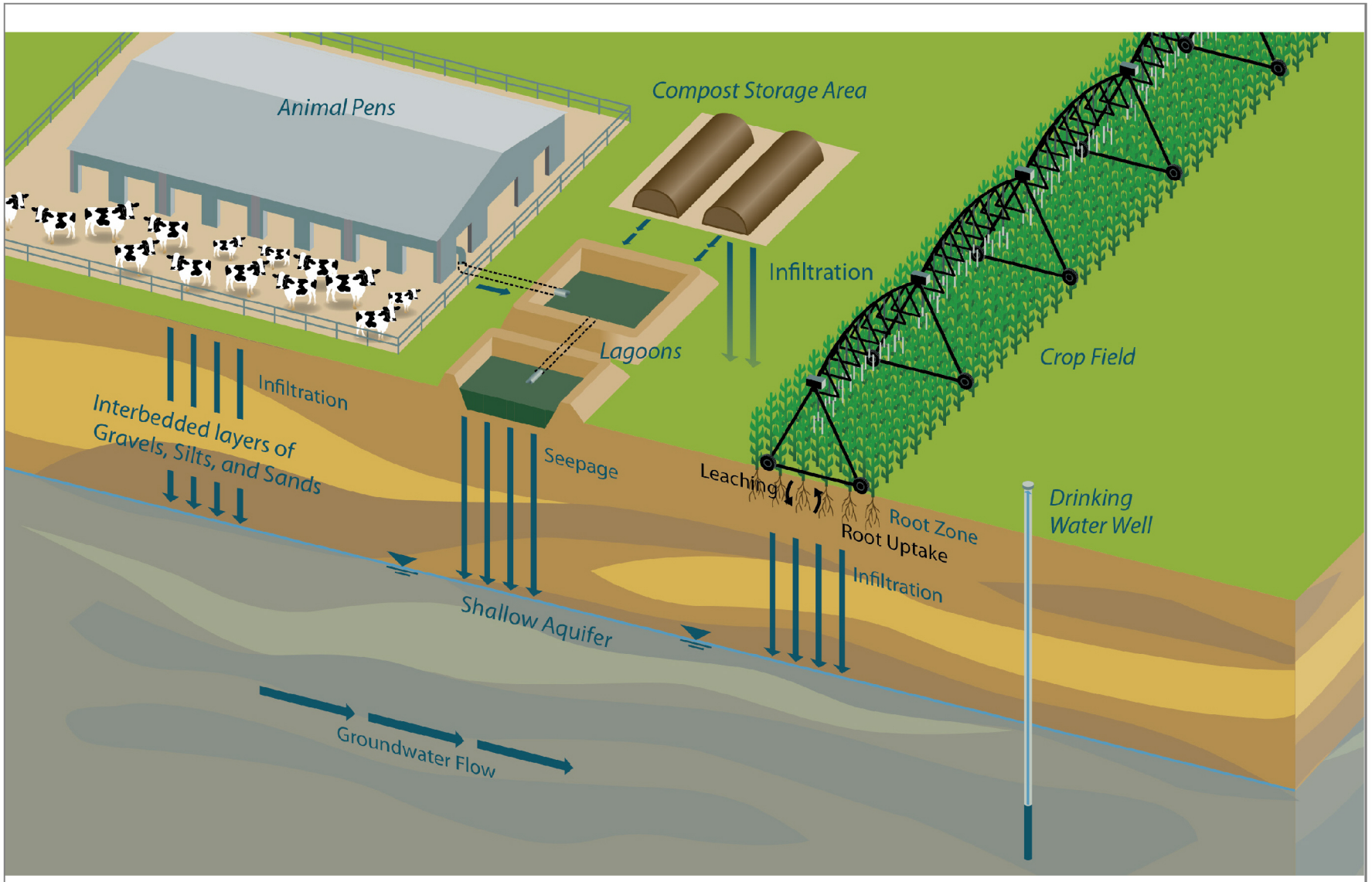
ANCHOR QEA

Figure 3
Progress of Lagoon Lining and Abandonments
2023 Annual Report
Yakima Valley Dairies



Note: Figure 4 is conceptual in nature and identifies potential nitrogen transport pathways identified by EPA for a typical dairy facility.

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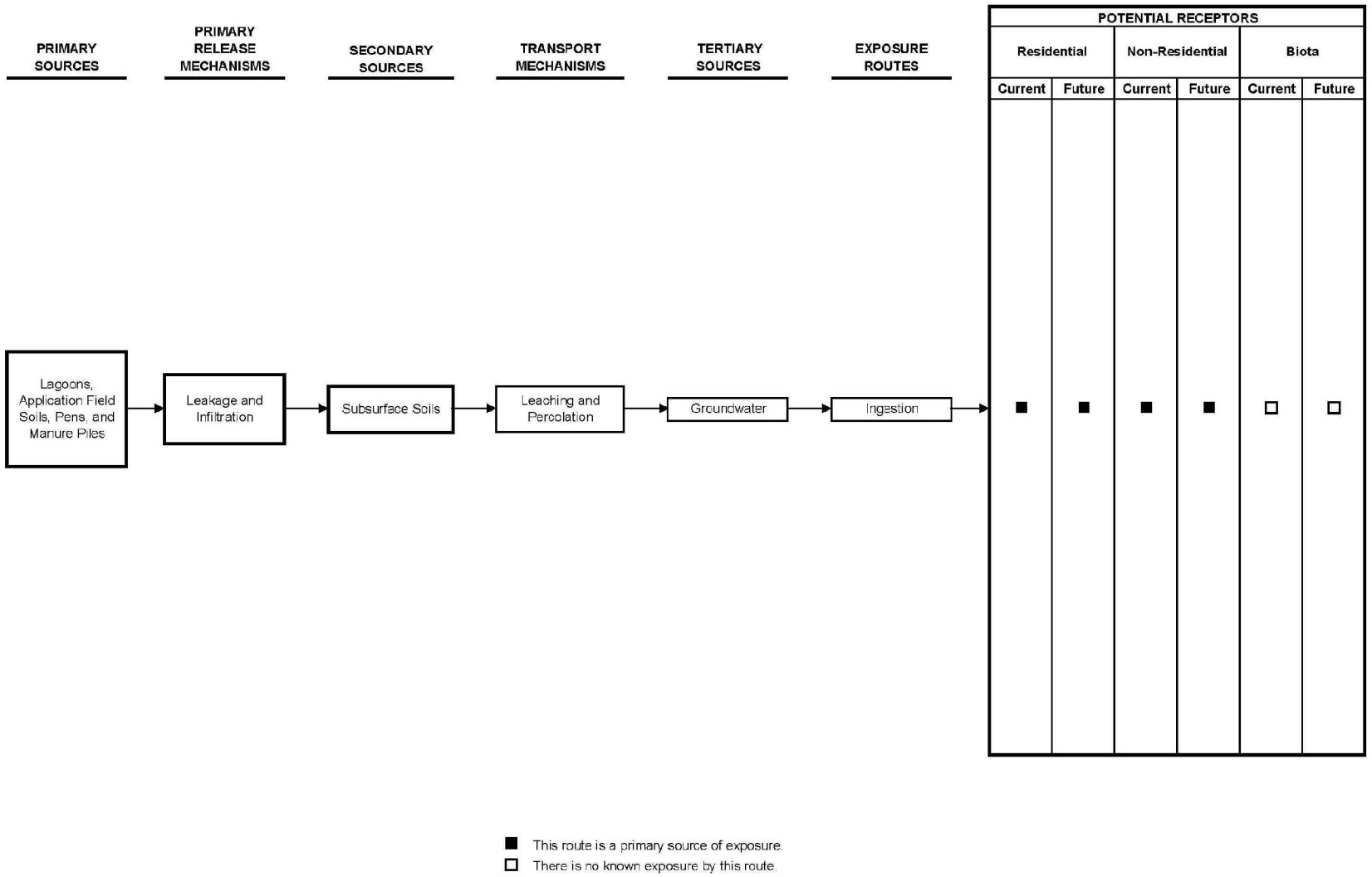
ANCHOR QEA

Figure 4
Conceptual Site Model
2023 Annual Report
Yakima Valley Dairies



SOURCE: ARCADIS

Publish Date: 2016/11/10 12:23 PM | User: hhayward
Filepath: K:\Projects\0996-Perkins Coie\Yakima Dairies Project\GW Monitoring Summary Report\0096-RP-001.dwg 4

ANCHOR QEA

Figure 5
Conceptual Site Model Flow Chart
2023 Annual Report
Yakima Valley Dairies

Appendix F
2023 Cow Palace Dairy CAFO Annual Report

AGRIMANAGEMENT INC.®
AGRICULTURAL CONSULTANTS
Measuring Crop Needs for Greater Profits

January 29, 2024

Washington Department of Ecology
Water Quality Program
Attn: CAFO Permit Administrator
P.O. Box 47600
Olympia, WA 98504-7600

Re: Cow Palace Dairy 2023 CAFO Annual Report
Permit #: WAG994354

Enclosed is the 2023 CAFO Annual Report for Cow Palace Dairy. This report contains information regarding sampling and application data for the entire 2023 cropping season as defined from post-harvest 2022 to post-harvest 2023.

The following items are included in this annual report:

- Annual Report Form (including the signature page)
- Adaptive Management Table
- Nutrient Source Content List
- Field Land Application Information
- Field Specific Nutrient Budgets

The values given for generated manures under the operations information represent the whole year, as determined by dairy management. Process wastewater is the calculated accumulation of parlor wash water and average precipitation. All given manure generation and wastewater values are before any expected losses, unless noted otherwise.

As reported under operations information, the amounts of exported liquid and solid manures represent the total exported off-site to third party farms and fields for the 2023season. Composted solids that are to be exported also include a drying period and therefore, there may be an overlap between years and a significant difference in weights between wet and dry tons.

In fall 2021, field specific nutrient budgets for the full season were constructed for triticale-silage corn double cropping as well as perennial alfalfa. A fall/winter and/or spring nutrient budget (supplemental) was also constructed where applicable. Full season and fall supplemental budgets for 2024 for all fields have been constructed, which will be included in next years' annual reporting.

All alfalfa yield data is adjusted to a full dry matter basis, while silage corn yield data is adjusted to a 30% dry matter basis.

Overall, recorded yields were average to slightly above average for both alfalfa and corn in 2023.

www.agrimgt.com 408 North 1st Street Yakima, WA 98901 Office: (509) 453-4851 Fax: (509) 588-1672

With all fields falling within the LOW risk level category, there will be no changes or adjustments to budgets and plans for 2024. Cow Palace Dairy will also continue to manage in a manner which results in maximizing production while minimizing residual nitrogen.

If any additional information is needed, or if you have any questions, please contact Jeff Boivin.

Sincerely,

Jeff Boivin
Cow Palace General Manager

Scott Stephen

Scott Stephen
Soil Scientist, CCA, NRCS-TSP
Agrimanagement, Inc.

DEPARTMENT OF ECOLOGY
State of Washington

APPENDIX B: CAFO GENERAL PERMIT ANNUAL REPORT FORM

Permit No. WAG-994354
Facility Name: Cow Palace
Facility County: Yakima

Use this form to submit your annual report to Ecology. All facilities must submit a signed annual report each year on or before February 1st.

This report is for the activities conducted during crop year 20 23

Permittee Information

Facility Name: Cow Palace
Responsible Person: Jeff Boivin
Email: jeffb@dolsenco.com
Phone Number: 1-509-829-5777

Operator Information

Operator Name: Jeff Boivin
Email: jeffb@dolsenco.com
Phone Number: 1-509-728-1061

Facility Information

Provide the maximum number of each type of animal confined at the facility during the calendar year.

Milking Cow: 7,800
Dry Cow: 1,200
Calf: 3,600
Feedlot Beef:
Chicken - Broiler:
Chicken - Layer:
Swine at least 55 pounds:
Swine smaller than 55 pounds:

Sheep and lambs:

Turkeys:

Ducks:

Other: Heifers - 450

How much manure, litter, process waste, process wastewaster, and other organic by-products did your facility generate during the past year?

Liquid Manure: 11,931,611	Units: gallons
Solid Manure: 165,000	Units: tons-w
Poultry Litter:	Units:
Process Wastewater: 44,558,481	Units: gallons
Digestate:	Units:
Other Organic By-products:	Units:

How much manure, litter, process waste, process wastewaster, and other organic by-products did your facility export during the past year?

Liquid Manure: 4,629,850	Units: gallons
Solid Manure 28,483	Units: tons-dr
Poultry Litter:	Units:
Process Wastewater:	Units:
Digestate:	Units:
Other Organic By-products:	Units:

What is the total number of acres covered in your Manure Pollution Prevention Plan?

526

What is the total number of acres you applied nutrients to or are in control of for this reporting period?

526

Discharge Information

During the year, has manure, litter, process waste, or process wastewater discharged from your production area or land application fields? If you are covered by the Combined Permit, do not include discharges of agricultural stormwater here.

- [x] NO
- [ ] YES.

If YES, provide a summary of the approximate date, time, volume and duration of the discharge(s). Summarize your response to the discharge(s) on a separate sheet of paper and attach it with your annual report.

Field Nutrient Budgets

Attach the final field-specific nutrient budgets prepared for each field that received manure nutrients. I have included my field-specific nutrient budgets for the year 20 23 .

Certification

A person who has signature authority must sign the Application. Signature authority is defined in General Condition 14 as:

a. In the case of corporations, by a responsible corporate officer.

b. In the case of a partnership, by a general partner of a partnership.

c. In the case of sole proprietorship, by the proprietor.

In the case of a municipal, state, or other public facility, by either a principal executive officer or ranking elected official.

"I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Printed Name: Date:

Signature:

Paper Submittal Instructions

Once the information in above sections is complete and the form is signed by the Legally Responsible Party, mail the form and attachments to:

Washington Department of Ecology

Water Quality Program

Attn: CAFO Permit Administrator

PO Box 47600

Olympia, WA 98504-7600

Keep a copy of the completed form and attached documents for your records.

Questions

If you need assistance when filling out this report, please contact your CAFO permit inspector at the Washington Department of Agriculture.

If you're unable to reach your permit inspector, contact the CAFO permit administrator at (360) 407-6600 or cafopermit@ecy.wa.gov.

Certification

"I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."	
Printed Name: Jeffrey M Boivin	Date: 1/30/24
Signature: Jeffrey M Boivin	

Appendix G
2023 Liberty/H&S Bosma Dairies CAFO Reporting Data

DEPARTMENT OF ECOLOGY
State of Washington

APPENDIX B: CAFO GENERAL PERMIT ANNUAL REPORT FORM

Permit No. WAG-____ ____
Facility Name: Liberty Dairy
Facility County: Yakima

NOTE: Liberty Dairy is in the process of finishing its MPPP and will be applying for the CAFO Permit soon.

Use this form to submit your annual report to Ecology. All facilities must submit a signed annual report each year on or before February 1st.

This report is for the activities conducted during cropping year 20 23

Permittee Information

Facility Name: Liberty Dairy

Responsible Person: Henry Bosma

Email: cowman@centurylink.net

Phone Number: (509) 728-2405

Operator Information

Operator Name: Henry Bosma

Email: same

Phone Number: same

Facility Information

Provide the maximum number of each type of animal confined at the facility during the calendar year.

Milking Cow: 5,000

Dry Cow: 550

Calf: 900

Feedlot Beef:

Chicken - Broiler:

Chicken - Layer:

Swine at least 55 pounds:

Swine smaller than 55 pounds:

Sheep and lambs:

Turkeys:

Ducks:

Other: Heifers - 1,000

How much manure, litter, process waste, process wastewaster, and other organic by-products did your facility generate during the past year?

Liquid Manure: 10,815,000	Units: gallons
Solid Manure: 97,000	Units: tons-w
Poultry Litter:	Units:
Process Wastewater: 29,300,000	Units: gallons
Digestate:	Units:
Other Organic By-products:	Units:

How much manure, litter, process waste, process wastewaster, and other organic by-products did your facility export during the past year?

Liquid Manure: ~2,000,000	Units: gallons
Solid Manure ~32,000	Units: tons-dr
Poultry Litter:	Units:
Process Wastewater:	Units:
Digestate:	Units:
Other Organic By-products:	Units:

What is the total number of acres covered in your Manure Pollution Prevention Plan?

821 - SU acres only

What is the total number of acres you applied nutrients to or are in control of for this reporting period?

624 - SU acres only

Discharge Information

During the year, has manure, litter, process waste, or process wastewater discharged from your production area or land application fields? If you are covered by the Combined Permit, do not include discharges of agricultural stormwater here.

- [x] NO
- [ ] YES.

If YES, provide a summary of the approximate date, time, volume and duration of the discharge(s). Summarize your response to the discharge(s) on a separate sheet of paper and attach it with your annual report.

Field Nutrient Budgets

Attach the final field-specific nutrient budgets prepared for each field that received manure nutrients. I have included my field-specific nutrient budgets for the year 20 23 .

Certification

A person who has signature authority must sign the Application. Signature authority is defined in General Condition 14 as:

a. In the case of corporations, by a responsible corporate officer.

b. In the case of a partnership, by a general partner of a partnership.

c. In the case of sole proprietorship, by the proprietor.

In the case of a municipal, state, or other public facility, by either a principal executive officer or ranking elected official.

"I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Printed Name: Date:

Signature:

Paper Submittal Instructions

Once the information in above sections is complete and the form is signed by the Legally Responsible Party, mail the form and attachments to:

Washington Department of Ecology

Water Quality Program

Attn: CAFO Permit Administrator

PO Box 47600

Olympia, WA 98504-7600

Keep a copy of the completed form and attached documents for your records.

Questions

If you need assistance when filling out this report, please contact your CAFO permit inspector at the Washington Department of Agriculture.

If you're unable to reach your permit inspector, contact the CAFO permit administrator at (360) 407-6600 or cafopermit@ecy.wa.gov.

Appendix H
2023 George DeRuyter & Son/D&A Dairies CAFO Annual Report

AGRIMANAGEMENT INC.®
AGRICULTURAL CONSULTANTS
Measuring Crop Needs for Greater Profits

January 30, 2024

Washington Department of Ecology
Water Quality Program
Attn: CAFO Permit Administrator
P.O. Box 47600
Olympia, WA 98504-7600

Re: George DeRuyter & Sons Dairy 2023 CAFO Annual Report
Permit #: WAG994350

Enclosed is the 2023 CAFO Annual Report for George DeRuyter & Sons Dairy. This report represents soil and application data and information for the entire 2023 cropping season for both George DeRuyter & Sons Dairy and D&A Dairy.

The following items are included in this annual report:

- Annual Report Form (including the signature page)
- Adaptive Management Table
- Nutrient Source Content List
- Field Land Application Information
- Field Specific Nutrient Budgets

As reported under operations information, the amount of exported liquid and solid manures represents the total exported off-site to third party farms and fields for 2023. George DeRuyter & Sons Dairy continually recycles a portion of the compost for bedding purposes. Composted solids that are to be exported also include a drying period and therefore, there is always an overlap between years. Manures generated are an estimated total as defined by the dairy's DNMP and represent values before any expected losses. Actual values may vary.

Field specific full season nutrient budgets were constructed for all crops in fall 2022 and update spring 2023. Additional winter budgets were constructed as applicable, and all are included in this annual report.

Yields for 2023 remained variable but slightly below average for alfalfa due to cool spring temperatures, which lowered the yield on the traditionally heaviest first cutting. Triticale and silage corn yields were typical to slightly above average overall.

Overall, fields were well maintained. Additional budget adjustments were made to fields SU04 and SU05 to aid in reduction of residual nutrients. George DeRuyter & Sons Dairy will also continue to manage crops in a manner that result in maximizing production while reducing residual nitrogen. GDS continues to use a denitrification system that has helped to reduce nutrient concentration in its liquid manures. Any additional management changes that may result in lower residual soil levels will be considered.

www.agrimgt.com 408 North 1st Street Yakima, WA 98901 Office: (509) 453-4851 Fax: (509) 588-1672

If any additional information is needed, or if you have any questions, please contact Dan DeRuyter or me.

Sincerely,

Scott Stephen

Scott Stephen
Soil Scientist, CCA, NRCS-TSP
Agrimanagement, Inc.

DEPARTMENT OF ECOLOGY
State of Washington

APPENDIX B: CAFO GENERAL PERMIT ANNUAL REPORT FORM

Permit No. WAG-994350
Facility Name: George DeRuyter & Sons Dairy
Facility County: Yakima

Use this form to submit your annual report to Ecology. All facilities must submit a signed annual report each year on or before February 1st.

This report is for the activities conducted during cropping year 2023

Permittee Information

Facility Name: George DeRuyter & Sons Dairy
Responsible Person: Dan DeRuyter
Email: gdrdairy@bentonrea.com
Phone Number: 509-837-7783

Operator Information

Operator Name: Dan DeRuyter
Email: danderuyter@gmail.com
Phone Number: 1-509-391-0457

Facility Information

Provide the maximum number of each type of animal confined at the facility during the calendar year.

Milking Cow: 5,300
Dry Cow: 600
Calf:
Feedlot Beef:
Chicken - Broiler:
Chicken - Layer:
Swine at least 55 pounds:
Swine smaller than 55 pounds:

Sheep and lambs:

Turkeys:

Ducks:

Other: Heifer - 4,830

How much manure, litter, process waste, process wastewaster, and other organic by-products did your facility generate during the past year?

Liquid Manure: 13,987,046	Units: gallons
Solid Manure: 89,714	Units: tons-w
Poultry Litter:	Units:
Process Wastewater: 19,868,627	Units: gallons
Digestate:	Units:
Other Organic By-products:	Units:

How much manure, litter, process waste, process wastewaster, and other organic by-products did your facility export during the past year?

Liquid Manure: 2,400,000	Units: gallons
Solid Manure 19,339	Units: tons-dr
Poultry Litter:	Units:
Process Wastewater:	Units:
Digestate:	Units:
Other Organic By-products:	Units:

What is the total number of acres covered in your Manure Pollution Prevention Plan?

1,232

What is the total number of acres you applied nutrients to or are in control of for this reporting period?

999

Discharge Information

During the year, has manure, litter, process waste, or process wastewater discharged from your production area or land application fields? If you are covered by the Combined Permit, do not include discharges of agricultural stormwater here.

- [x] NO
- [ ] YES.

If YES, provide a summary of the approximate date, time, volume and duration of the discharge(s). Summarize your response to the discharge(s) on a separate sheet of paper and attach it with your annual report.

Field Nutrient Budgets

Attach the final field-specific nutrient budgets prepared for each field that received manure nutrients. I have included my field-specific nutrient budgets for the year 20_____.

Certification

A person who has signature authority must sign the Application. Signature authority is defined in General Condition 14 as:

a. In the case of corporations, by a responsible corporate officer.

b. In the case of a partnership, by a general partner of a partnership.

c. In the case of sole proprietorship, by the proprietor.

In the case of a municipal, state, or other public facility, by either a principal executive officer or ranking elected official.

"I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Printed Name: Date:

Signature:

Paper Submittal Instructions

Once the information in above sections is complete and the form is signed by the Legally Responsible Party, mail the form and attachments to:

Washington Department of Ecology

Water Quality Program

Attn: CAFO Permit Administrator

PO Box 47600

Olympia, WA 98504-7600

Keep a copy of the completed form and attached documents for your records.

Questions

If you need assistance when filling out this report, please contact your CAFO permit inspector at the Washington Department of Agriculture.

If you're unable to reach your permit inspector, contact the CAFO permit administrator at (360) 407-6600 or cafopermit@ecy.wa.gov.

Certification

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EPA United States Environmental Protection Agency

Risk Assessment Evaluation for Concentrated Animal Feeding Operations

EPA/600/R-04/042
May 2004

Risk Management Evaluation For Concentrated Animal Feeding Operations

U.S. Environmental Protection Agency
Office of Research and Development
National Risk Management Research Laboratory
Cincinnati, Ohio

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Foreword

The U.S. Environmental Protection Agency (EPA) is charged by Congress with protecting the Nation's land, air, and water resources. Under a mandate of national environmental laws, the Agency strives to formulate and implement actions leading to a compatible balance between human activities and the ability of natural systems to support and nurture life. To meet this mandate, EPA's research program is providing data and technical support for solving environmental problems today and building a science knowledge base necessary to manage our ecological resources wisely, understand how pollutants affect our health, and prevent or reduce environmental risks in the future.

The National Risk Management Research Laboratory (NRMRL) is the Agency's center for investigation of technological and management approaches for preventing and reducing risks from pollution that threaten human health and the environment. The focus of the Laboratory's research program is on methods and their cost-effectiveness for prevention and control of pollution to air, land, water, and subsurface resources; protection of water quality in public water systems; remediation of contaminated sites, sediments and ground water; prevention and control of indoor air pollution; and restoration of ecosystems. NRMRL collaborates with both public and private sector partners to foster technologies that reduce the cost of compliance and to anticipate emerging problems. NRMRL's research provides solutions to environmental problems by: developing and promoting technologies that protect and improve the environment; advancing scientific and engineering information to support regulatory and policy decisions; and providing the technical support and information transfer to ensure implementation of environmental regulations and strategies at the national, state, and community levels.

This publication has been produced as part of the Laboratory's strategic long-term research plan. It is published and made available by EPA's Office of Research and Development to assist the user community and to link researchers with their clients.

Lawrence W. Reiter, Acting Director.
National Risk Management Research Laboratory

Abstract

The National Risk Management Research Laboratory (NRMRL) developed a Risk Management Evaluation (RME) to provide information to help plan research dealing with the environmental impact of concentrated animal feeding operations (CAFOs). Methods of animal production in the U.S. have undergone fundamental changes in the last 30 years. The majority of meat, dairy, and poultry production has been concentrated into large facilities. Dairies with more than 2,000 cows and swine operations with more than 10,000 hogs are not unusual. Broiler houses with 50,000 birds are common. With the concentration of animals has come a concomitant concentration of manure production. One animal facility with a large population of animals can easily equal a small city in terms of waste production. Current practices of waste handling often include minimal or no treatment before the wastes are disseminated into the environment. The RME was developed to provide characterization of the waste problem, and a description of common environmental stressors and their movement including the air transport of pollutants. Current risk management practices in the animal industry are described, along with treatment approaches such as anaerobic/aerobic digestion, constructed wetlands, and disturbed land reclamation. Finally, suggested areas for future research are presented to help focus planning for the near future.

Table of Contents

1 OVERVIEW OF RISK MANAGEMENT DOCUMENT 1

2 INTRODUCTION 6

2.1 Agricultural Sectors Considered in this Document 6

3 MANURE PRODUCTION AND MANAGEMENT 7

3.1 Manure Quantities Among Animal Populations 7
3.1.1 Poultry 9
3.1.1.1 Broilers/Roasters and Turkeys 10
3.1.1.2 Layers 11
3.1.2 Swine 12
3.1.3 Cattle 15
3.1.3.1 Beef Feedlots 15
3.1.3.2 Dairy 17
3.2 Manure Characteristics. 19
3.2.1 Physical Properties 20
3.2.2 Nutrient Content and Form from Poultry 21
3.2.2.1 Layers, Broilers, and Turkeys 21
3.2.2.2 Layers 21
3.2.2.3 Nutrient Content and Form from Swine 21
3.2.2.4 Nutrient Content and Form from Cattle 21
3.3 Manure Management Practices 22
3.3.1 Wet Manure Management 22
3.3.2 Dry Manure Management 22

4 WATERSHED STRESSORS IN CAFO WASTE 24

4.1 Nutrients 24
4.1.1 Nitrogen 25
4.1.2 Phosphorus 27
4.1.3 Mineral Salts 28
4.2 Pathogens 28
4.2.1 Pathogens of Concern at CAFOs 29
4.2.1.1 Bacteria 29
4.2.1.2 Fungi 30
4.2.1.3 Viruses 30
4.2.1.4 Helminths 30
4.2.1.5 Protozoa 30
4.2.2 Disease Descriptions 31
4.2.3 Effects of Pathogen Pollution 32
4.2.4 Human Diseases: Examples of Manure-Related Human Epidemics, Case Studies of Problems and Potential for Problems with Pathogens in Animal Manure 33
4.2.4.1 Walkerton, Ontario 33
4.2.4.2 Washington County Fair, New York 33
4.2.4.3 Carrolton, GA 34

4.2.4.4 Wilshire, Swindon, and Oxfordshire, England 34
4.2.4.5 Bradford, England 34
4.2.4.6 Milwaukee, Wisconsin 34
4.2.4.7 Maine 34
4.2.4.8 Sakai City, Japan 34
4.2.4.9 Cabool, Missouri 34
4.2.5 Animal Diseases 35
4.3 Antibiotics 36
4.3.1 Case studies on the effect of antibiotics related to CAFOs on the environment: 37
4.3.1.1 Case 1 – Chesapeake Bay 37
4.3.1.2 Case 2 – Iowa Swine Operations 37
4.3.1.3 Case 3 – Shoal Creek 38
4.3.1.4 Case 4 – A National Reconnaissance 38
4.4 Endocrine Disrupting Chemicals Associated with Concentrated Animal Feeding Operations 38
4.4.1 Xenobiotic Hormones 40
4.4.2 Uses of Hormones in CAFOs 41
4.4.3 Release of Hormones to the Environment 42
4.5 Metals 43
4.5.1 Use of Metals in Animal Feed 43
4.5.2 Mobility of metals in soil 43
4.5.3 Metals in plants 45
4.5.4 Metals in Animals 46
4.5.5 Summary 46
5 STRESSOR TRANSPORT 48
5.1 Transport Mechanisms 48
5.1.1 Overland Transport in Wet Weather Flow 48
5.1.2 Physical and Chemical Processes Affecting Sediment Impacts 48
5.1.3 Overland Flow 48
5.1.4 Interflow 49
5.1.5 Groundwater flow 49
5.2 How These Processes Impact Typical CAFO Operations 49
5.2.1 Suspended Solids and Sediments (SSAS) 50
5.2.2 Stress due to SSAS 51
5.3 Groundwater Transport 52
5.3.1 Statement of Problem 52
5.3.2 Pollutants, Sources, Transport, and Fate 53
5.3.2.1 Nitrogen 53
5.3.2.2 Ammonia 53
5.3.2.3 Nitrate 54
5.3.2.4 Phosphorus 55
5.3.2.5 Pathogens 56
5.3.3 Risk Management 57
5.3.4 Storage Facilities 57
5.3.5 Farming Practices 58
5.3.6 Natural Filters 61
6 AIR TRANSPORT AND DEPOSITION 63

6.1 Current Air Quality Issues Associated with Agriculture 63
6.1.1 Ammonia 63
6.1.2 Nitrous Oxide 64
6.1.3 Methane 64
6.1.4 Carbon dioxide 65
6.1.5 Hydrogen sulfide 65
6.1.6 Criteria Air Pollutants 65
6.2 Generation of Air Emissions Resulting from Operational Variables 66
6.2.1 Air Emissions from Land Application Activities 66
6.2.2 Odors 68
6.2.3 Particulate Matter 68
6.3 SUMMARY 69

7 RISK MANAGEMENT OPTIONS FOR CAFO WASTE 70

7.1 Land Application 70
7.2 Practices Used in Land Application 71
7.2.1 Application Systems 71
7.2.2 Potential Problems Associated with Manure Applications 72
7.2.3 Soil Management Practices to Reduce Problems 74
7.2.4 Runoff Control from Land Application Fields 74
7.2.4.1 Reducing Soil Detachment 74
7.2.4.2 Reducing SSAS Transport within a Field 75
7.2.4.3 Trapping Sediment after the Field 75
7.3 Composting of CAFO wastes 77
7.3.1 What is Composting? 77
7.3.2 Composting systems 78
7.3.2.1 Interventionary Systems 78
7.3.2.2 Non-Interventionary Systems 78
7.3.3 Comparison of Interventionary and Non-interventionary Systems 78
7.3.4 Composting in the Beef and Dairy Industries 78
7.3.4.1 Beef 78
7.3.4.2 Dairy 79
7.3.4.3 Composting Swine Waste 79
7.3.4.4 Composting Poultry Waste 80
7.3.5 Composting Concerns and Problems 81
7.3.5.1 Nutrients 81
7.3.5.2 Pathogens 81
7.3.6 Land Application of Compost 83
7.4 A Strategy Requiring Some Additional Research– Anaerobic Digestion 83
7.4.1 Technology Description 83
7.4.1.1 Covered Lagoons 83
7.4.1.2 Complete Mix Digester 84
7.4.1.3 Plug-flow Digester 85
7.4.2 Application 85
7.4.3 Operation and Performance 86
7.4.4 Fuel Gas Production 87

7.5 Technologies Requiring Significant Additional Research Before Implementation-Aerobic Digestion-Wetlands-Land Reclamation 88
7.5.1 Aerobic Digestion 88
7.5.1.1 Types of Aerobic Digestion Technologies 89
7.5.1.2 Application 89
7.5.2 Wetlands 90
7.5.2.1 Constructed Wetlands 90
7.5.2.2 Restored Wetlands 90
7.5.2.3 Enhancement Wetlands 90
7.5.2.4 Free Water Surface (FWS) Wetlands 90
7.5.2.5 Vegetated Submerged Bed (VSB) Wetlands 91
7.5.2.6 Reciprocating (ReCip) wetlands and vertical-flow (VF) wetlands 91
7.5.3 Treatment Mechanisms 91
7.5.4 Plant Functions 92
7.5.5 Risk Associated with Constructed Wetlands 93
7.5.6 Application and Performance of Constructed Wetlands for Agricultural Wastewaters 94
7.5.7 Processes to Significantly Reduce Pathogens (PSRP) 97
7.5.8 Recommendation 97
7.5.8.1 Composting 97
7.5.8.2 Air Drying 98
7.5.8.3 Facultative lagoons / Storage 98
7.5.8.4 Anaerobic Digestion 98
7.5.8.5 Aerobic Digestion 99
7.5.8.6 Lime Stabilization 99
7.6 Land reclamation 100
7.6.1 Non-Farm Land Applications 100
7.6.2 Phytoremediation Projects, Sediment Recycling, and Landfill Covers 100
7.6.3 Riparian Corridors 100
7.6.4 Forest Products: Short Rotation Wood Crops- Pulp & Paper, Lumber, Fuel 100
7.6.5 Highways: Roadsides and Medians 101

8 RESEARCH NEEDS ASSOCIATED WITH CAFOS 102

8.1 Overview 102
8.2 Stressor Evaluation and Quantification 102
8.3 Process Research 103
8.4 Fate and Effects of Stressors in the Environment 103
8.5 Ground Water 104
8.6 Aerosol Research 105
8.7 Land Reclamation 106

9 REFERENCES 107

List of Tables

Table 3.1 Change in Animal Units, 1982 to 1997. 7
Table 3.2 Change in CAFO Operations from 1982 to 1997 8
Table 3.3 Manure Production per 1000 Pounds Live Weight on an Annual Basis 9
Table 3.4 Nitrogen and Phosphorus Content of Animal Waste 20
Table 3.5 Characteristics of Animal Manure Based on 1000 Pound Live Weight 20
Table 4.1 Diseases and Animals Commonly Identified as Sources of the Causative Organisms 30
Table 4.2 Examples of Manure-Related Human Epidemics 33
Table 4.3 Sources of Common Zoonotic Diseases on Farms 36
Table 4.4 Antibiotic Levels in the Lagoons and in One Monitoring Well (adapted from Table 7) (Iowa Dept. Public Health, 1997) 37
Table 4.5 Hormones Approved for Veterinary Use in Cattle 42
Table 4.6 Copper and Zinc in Swine Diets 43
Table 4.7 Soil Cu Balance after Five Years of Repeated Pig Slurry Application 44
Table 4.8 Soil Zn Balance after Five Years of Repeated Pig Slurry Application 44
Table 4.9 Cu and Zn in Soil (top 5 cm) February, 1987 and Herbage First Cut of 1986 45
Table 7.1 Functions of Soil Conservation Practices (adapted from USEPA, 2001a) 76
Table 7.2 Status of Farm-Based Digesters in the United States 85
Table 7.3. Performance Data Summarized for Gulf of Mexico Program (CH2M-Hill,1997) 94
Table 7.4. Agricultural Treatment Wetlands in the NADB 94
Table 7.5. Range of Costs and Operating Parameters for NADB Agricultural Treatment Wetlands 95
Table 7.6. 95% Confidence Interval about the Mean for all NADB Agricultural Treatment Wetlands 95
Table 7.7. Preliminary Averages for ReCip System Treating Swine Wastewater 97
Table 7.8. Microbiological Quality Guidelines and Standards for Application of Wastes to Land 98
Table 7.9. Effects of Waste Treatment and Management Systems on Pathogen Reduction 99

List of Figures

1.1 Phosphorus Assimilative Capacity for Farms 2
1.2 Excess Phosphorus on Farms with No Export 3
3.1 Poultry Production distribution in the United States 10
3.2 Turkey Production Distribution in the United States 11
3.3 Layer and Pullet Distribution in the United States 12
3.4 Change in Swine Production Distribution in the United States 13
3.5 Swine confinement barns with lagoon 14
3.6 Swine pens inside barn with slatted floors 14
3.7 Change in Cattle Locations as of the 1997 Census 15
3.8 Aerial view of a feedlot in Kansas with a lagoon 16
3.9 Change in Distribution of Dairy Cattle in the United States 17
3.10 Dairy farm with a manure storage tank 18
3.11 Dairy farm with poor manure management and detrimental impact on the environment 19
4.1 Depiction of Carbon and Nitrogen Cycles in Soils or Sediments 26
4.2 Diagrammatic Illustration of Preferential Flow through Macropores and Interstitial (porewater) Flow in the Soil Matrix 27
4.3 Frequency of Detection of Organic Wastewater Contaminants by General Use Category (4A), and Percent of Total Measured Concentration of Organic Wastewater Contaminants by General Use Category shown above Bar (Kolpin, et al., 2001) 39
4.4 Structure of Biogenic Hormones 40
4.5 Chemical Structure of Trenbelone Acetate and Hydroxide 41
5.1 Transport Pathways of Pollutants Derived from Animal Waste 54
5.2 Nitrogen-Carbon Cycling in Soil/Sediment Derived from Animal Waste 55
5.3 Diagrammatic Illustration of Preferential Flow through Macropores and Interstitial (Pore-Water) Flow in the Soil Matrix 56
5.4 Concrete manure storage tank. Structures of this type will prevent leakage of wastes into groundwater. 59
5.5 A new lagoon with a synthetic geotextile liner to prevent seepage into groundwater. 60
5.6 Terraced fields to prevent erosion of soil on sloping land 61
6.1 High velocity sprinkler, a potential source of airborne contaminants 67
6.2 Tank truck applying manure with the potential for aerosol generation 67
7.1 Tractor drawn liquid manure application after corn harvest 72
7.2 Means of Manure Disposal by Animal Sector 72
7.3 Mixed compost from turkey waste 80
7.4 Turkey waste compost with wood chips and feathers 81
7.5 Truck mounted spreader applying compost to a field 84
7.6 Covered manure tank generating methane in Iowa 86
7.7 Free Water Surface (FWS) Wetlands 91
7.8 Vegetated Submerged Bed (VSB) Wetland 92
7.9 View of a hog operation with a lagoon flowing into constructed wetlands for treatment of wastewater 96
7.10 Ground level view of constructed wetland with the owner making observations for his records 96

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In addition, several figures were derived from the USDA National Resources Conservation Service website and included in this document. The NRCS website is also a source for the pictures used in this document. The NRCS Photo Gallery contains natural resource and conservation related photos from across the USA. The Gallery is a joint project between NRCS Conservation Communications and the NRCS Information Technology Center in Ft. Collins, Colorado.

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Figure 3.8 ..... NRCS
Figure 3.10 ..... NRCS
Figure 3.11 ..... NRCS

Figure 5.4 ..... NRCS
Figure 5.5 ..... NRCS
Figure 5.6 ..... NRCS
Figure 6.1 ..... NRCS
Figure 6.2 ..... NRCS
Figure 7.1 ..... NRCS
Figure 7.3 ..... NRCS
Figure 7.4 ..... NRCS
Figure 7.5 ..... NRCS
Figure 7.6 ..... NRCS
Figure 7.9 ..... NRCS
Figure 7.10 ..... NRCS

Contributors

Edwin Barth	Aerosols
Dr. Donald Brown	Wetlands
Dr. John Cicmanec	Pathogenic Organisms and Background
Jennifer Goetz	Antibiotics
Dr. John Haines	Land Application
Dr. Mohamed Hantush	Groundwater
Ronald Herrmann	Composting
Dr. Paul McCauley	Nutrients
Kim McClellan	Aerosols
Dr. Marc Mills	Sediments and Wet Weather Flow
Teri Richardson	Digestion
Steven Rock	Land Reclamation
Sally Stoll	Metals
Dr. Gregory Sayles	Endocrine Disrupting Compounds
Dr. James Smith	Pathogenic Organisms
Stephen Wright	Sediments and Wet Weather Flow

Editors: Dr. John Haines and Laurel Staley

1 OVERVIEW OF RISK MANAGEMENT DOCUMENT

This document is intended to help the reader gain an understanding of potential environmental problems associated with Concentrated Animal Feeding Operations (CAFOs). Although a variety of animals are raised in CAFOs, this document will focus on beef, dairy, swine and poultry. The quantities and characteristics of manure produced by the different animals are presented. The watershed stressors resulting from CAFO pollution are discussed, as are the transport mechanisms that disperse them through the environment. Common manure management practices are also presented.

Because large numbers of animals are confined in relatively small areas at CAFOs, a very large volume of manure is produced and must be kept in a correspondingly small area until disposed of. The age-old practice of land application is used, but the volumes of manure that must be disposed in this way frequently exceed the assimilative capacity of land within economic transport distances. This may result in the release of excess manure to watershed environments during the catastrophic breach of holding facilities or more commonly, during the intermittent runoff of excess manure applied to already saturated land. Figure 1.1 shows the phosphorus assimilative capacity of farmland in the United States. Figure 1.2 shows the excess phosphorus available on farms with no export. Clearly, an imbalance exists between available phosphorus and the capacity of the land to absorb phosphorus. The same general relationship holds for nitrogen. If land in entire counties were available for application of animal waste, the overburden of nutrients is somewhat relieved, but excess quantities of nutrients still exist in some locales. Neither of the maps shown takes into account fertilizer applied to fields.

This would be a problem even if manure contained only beneficial nutrients. In excess amounts, these nutrients damage, not improve, soil fertility and may pollute nearby water. More importantly, however, manure from CAFOs contains components other than nutrients. The dominant element in manure is carbon. Many of the carbon compounds in manure may contribute to oxygen depletion in water. The nutrient elements N and P in manures may also contribute to eutrophication of water if their entry into water is not controlled. Modern agriculture with its emphasis on intensive housing and speeding the growth of livestock to market weight has employed a variety of substances that have not been used before in animal husbandry. These include antibiotics to combat the spread of disease among animals housed in close quarters, natural and synthetic hormones to speed growth, and metals (As, Cu, Zn) to do the same and preserve the freshness of feed. When present in the large amounts of manure generated at CAFOs and stored on-site, these other substances pose a threat to the environment. The effects of antibiotics on native soil bacteria are largely unknown. The effects of biogenic and synthetic hormones on other animals and humans are largely unknown.

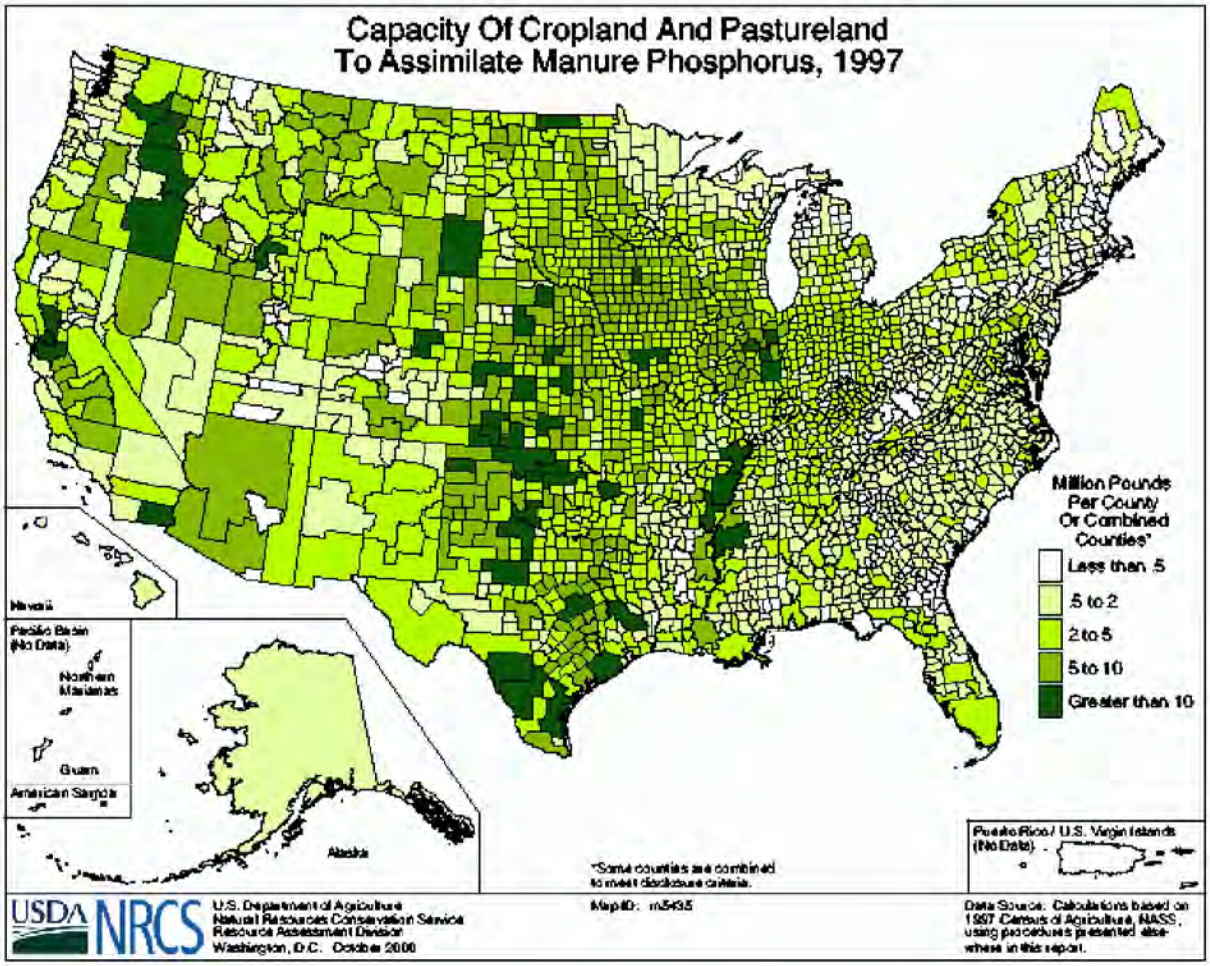

Figure 1.1. Phosphorus assimilative capacity for farms.

This Risk Management Evaluation (RME) is intended to document the salient environmental risks associated with hog, poultry, dairy and beef CAFOs and actions that could be taken to reduce those risks now. Areas in which further research is needed are identified and discussed in Section 8 of this document.

In reviewing the existing body of knowledge on intensive livestock agriculture, the following points became clear.

- Underlying all of the environmental problems associated with CAFOs is the fact that too much manure accumulates in restricted areas. Traditional means of using manure are not adequate to contend with the large volumes present at CAFOs.

- The nutrient load from CAFOs is large, with about 2.5 billion pounds of N and 1.4 billion pounds of P recoverable in manure. Total manure N is about 12.9 billion pounds and total manure P is about 3.8 billion pounds.

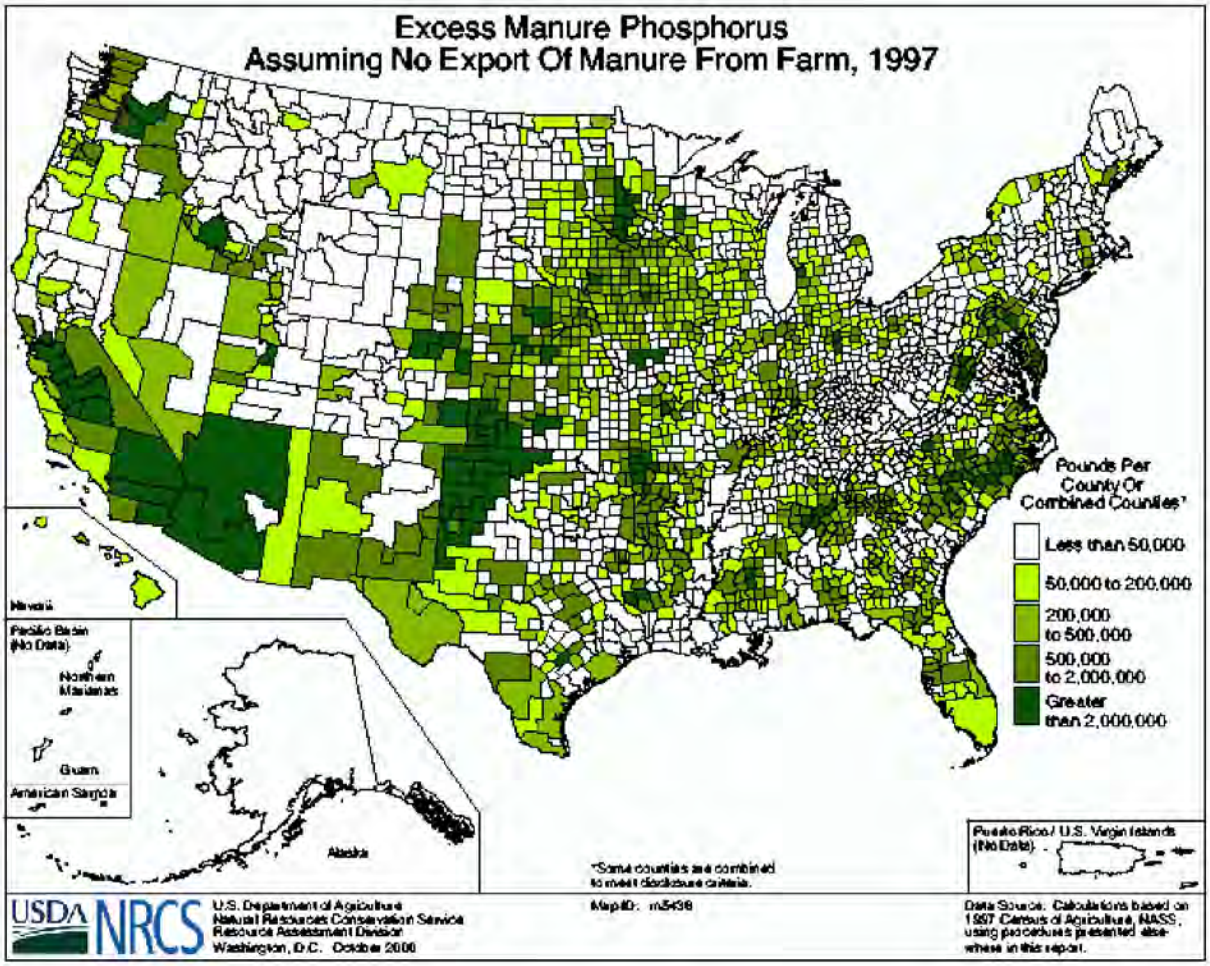

Figure 1.2. Excess phosphorus on farms with no export.

- CAFO manure contains potentially pathogenic microorganisms. The combination of large herds and closely confined housing makes it likely that at least some animals are asymptomatic carriers of pathogenic organisms. Once introduced, these pathogens may readily spread among the closely confined herd. Shed into the manure, these pathogens find favorable breeding grounds in the barns, manure storage and handling systems and are released into the watershed environment routinely during the land application of waste.

- The antibiotics administered to CAFO livestock may contribute to the development of antibiotic resistant strains of pathogens – especially those harbored within the livestock raised at these facilities. The sub-therapeutic use of antibiotics at CAFOs aggravates the problem.

- Naturally occurring and synthetic hormones administered to livestock to speed growth to market weight pollute the environment when released along with manure during land application or during an accidental release. The environmental effects of these compounds are largely unknown.

- Metals used as feed supplements to promote livestock growth may degrade the quality of the land to which waste is applied. Adverse environmental effects may result when waste containing metals is released into the watershed.

- Transport pathways for stressors from CAFOs encompass surface runoff, air transport and redeposition, and groundwater flow. Nutrients, pathogenic organisms, hormones and metals may easily reach waterbodies via these means.

There are measures that may be taken now to mitigate the risk posed by the large volumes of manure at CAFOs.

- Reduce the volumes of manure created by changing waste management, handling practices, and feed utilization efficiency.

- Treat manure to kill pathogens, attenuate hormones and other organic contaminants, and stabilize metals.

- Increase use of anaerobic treatment and composting to control odors, nutrients, pathogens, and generate renewable energy.

- Reduce the use of antibiotics to stem the development of antibiotic resistant pathogens.

- Increase soil conservation methods to reduce runoff and erosion from fields to which manure has been applied. Reduced tillage, terraces, grassed waterways, and contour planting offer conservation benefits.

- Install barriers such as riparian zones and wetlands to prevent manure-laden runoff from fields from reaching streams.

- Change barn ventilation and manure management and handling practices to minimize the airborne release of stressors.

- Where economic factors work against making changes to CAFO management practices, eliminate them or provide incentives for making such changes.

Additional research needs to be undertaken to develop a range of alternatives for managing CAFO manure. The U.S. Department of Agriculture is engaged in research to address many of these questions, especially with respect to nutrient issues. EPA intends to complement their efforts by working with them on mitigation strategies for nutrients and, more importantly, focusing on pathogen, hormone and metal issues.

The environmental challenges posed by CAFOs are not insoluble. In some cases, simple management of wastes in different ways will ameliorate some of the problems. More attention to good soil management and application of wastes at phosphorus based agronomic rates will reduce loads of pollutants reaching water bodies. Development of means to extract value from wastes will be needed to make treatment feasible and reduce health risks. Nitrogen, phosphorus and methane are some of the potentially valuable products recoverable from manures. The key problem for managing CAFO waste is one of distribution of the manure from points of production to application sites in an economically viable manner.

Beyond manure management, new issues are emerging such as the environmental impact of aquaculture and other intensive agricultural operations, the environmental effects of different types of mortality management, and how to mitigate the hydrologic changes brought about by large CAFO operations. These issues will be addressed in future versions of this RME.

2 INTRODUCTION

2.1 Agricultural Sectors Considered in this Document

Hog, poultry beef, and dairy production are considered in this document. Although there are other livestock production sectors that utilize intensive production methods, these represent the sectors most often identified as the cause of water quality problems caused by animal agriculture (USEPA, 2001). The recently promulgated rule addresses only these four agricultural sectors.

Animal production agriculture in recent years has evolved into a system with highly integrated production. A company known as an integrator owns all of the components of production from the feed, the animals themselves, and the slaughterhouse. Large numbers of animals are kept in barns or in the case of beef cattle in feedlots that are owned by a farmer who is acting as an independent contractor for the integrator. The farmer owns the facility where the animals are housed and fed. Typically, the farmer is responsible for manure handling, safe storage, and disposal. This usually means that the manure is stored in large piles or impoundments until it may be applied to the land. Manure has long been applied to agricultural land as a fertilizer and as a means of soil improvement. Today, however, the large numbers of animals housed in CAFOs generate waste on a scale that may overwhelm the capacity of the adjacent land to absorb it. It is this excess manure that causes the environmental problems associated with CAFOs.

Manure production varies by animal species, diet, and age of the animal. An animal unit is a 1000-pound animal, frequently taken as one market-weight beef animal. Each animal generates approximately 50 to 60 pounds of manure per day. From these figures, it may be seen that the waste load for a 1000 animal unit facility is quite large. For example, a beef feedlot with 1000 animals produces about 21,000,000 lbs of manure per year.

3 MANURE PRODUCTION AND MANAGEMENT

3.1 Manure Quantities Among Animal Populations

Animal farms produce as much manure as small and medium-size cities. A farm with 2500 dairy cattle is similar in waste load to a city of 411,000 people. Since about 1970, production of hogs, beef, poultry, and dairy has become concentrated into fewer large units. Between 1982 and 1997, the most recent years for which animal census data are available, the number of livestock has remained relatively constant, but the number of farms has declined significantly. Dramatic changes have occurred in American agriculture between 1982 and 1997, the most recent years for which animal census figures are available. The most significant change is the shift from small farms to the much larger, concentrated animal feeding operations (CAFOs). Table 3.1 shows a summary of changes in confined animal units from 1982 to 1997.

Table 3.1 Change in confined animal units, 1982 to 1997

Animal type	Size class	1982	1997	Percent change
Milk Cows	300-999	1,281,300	1,835,832	+43
	>1000	578,223	2,135,205	+265
	All smaller size classes decreased			
Beef	150-299	647,880	721,624	+11
	300-999	615,890	836,548	+36
	>1000	325,150	508,268	+56
	All smaller classes decreased			
Swine	150-299	948,702	1,196,911	+26
	300-999	654,301	2,113,110	+223
	>1000	213,048	2,851,534	+1238
	All smaller classes decreased			
Poultry	150-299	651,816	1,264,537	+94
	300-999	881,644	1,650,785	+87
	>1000	835,889	1,832,509	+119
	All smaller classes decreased			

The definition of a CAFO listed in the regulation development document (USEPA, 2001) is used in this document. A CAFO is an animal feeding facility that has more than 1000 animal units, or has between 300 and 1000 animal units and meets certain conditions or is designated a CAFO by the state, or has less than 300 animal units and is designated a CAFO by the state. The smaller size facilities are designated CAFOs primarily due to the potential the facility has for discharging pollutants to the waters of the United States. Animals must also be present in the facility for at least 45 days. The CAFO neither stores nor grows crops. Waste containment and disposal are also part of the CAFO designation. Poultry facilities are CAFOs if they contain more than 55,000 turkeys; 100,000 or more broilers or hens with continuous overflow watering; 30,000 or more hens or broilers with a liquid manure system; or 5,000 or more ducks. Designation as a CAFO requires the facility to obtain a NPDES discharge permit.

In 1982, CAFOs comprised only 3% of all farm operations and more importantly, only 35% of the total animal population. In 1997, CAFOs had risen to 5% of all farm operations and 50% of the animal population. The circumstances associated with these changes in animal population are unique for each of

the four principal farm animal group categories; beef cattle, dairy cattle, hogs, and poultry. Table 3.2 shows the changes in CAFO operations from 1982 to 1997, based on animal unit size classes.

These changes have been principally driven by economic factors, mostly economy of scale, that is, a few large farm units have the potential to be much more cost and operationally efficient than many small farm units. Perhaps the significance of the reduction in small farm units maybe made most dramatically by comparing the numbers of farm units in 1982 to 1997. In 1982, there were 1,260,085 farms with fewer than 150 animals compared to 921,957 in 1997. This represents a 26% reduction in the total number of small farm units. Meanwhile, the number of large farms with more than 1000 head of livestock increased from 5442 farms in 1982 to 8021 farms in 1997, which represents a 47% increase. And of course, the actual "shift" in numbers of animal units is even more dramatic. There were 45.8 million animals on small farms in 1982, but by 1997 this number was reduced to 34 million animals. Interestingly, this is a 26% reduction in the total animal population for small farms. In contrast, large farm operations, that is, those with more than 1000 animals, increased from 15.7 million in 1982 to 24.9 million in 1997, a 58% increase.

Table 3.2 Change in CAFO operations from 1982 to 1997

Animal type	Size class[1]	1982	1997	Percent change
Milk cows	300-999	3,385	4,534	+34
	>1,000	456	1,303	+186
Other beef and dairy	150-299	34,370	36,421	+6
	300-999	16,827	19,541	+16
	>1,000	2524	3,008	+19
Swine	150-299	4,730	5,726	+21
	300-999	1,432	4,134	+189
	>1,000	103	1,011	+882
Poultry	150-299	3,175	6,129	+93
	300-999	1,786	3,312	+85
	>1,000	362	688	+90

[1]All smaller size classes decreased in number

Different parts of the United States are associated with major production facilities. See Figures 3.1 through 3.4 for locations of major animal production locales. The different animal production sectors are vertically integrated to various degrees. Poultry production is most highly integrated, followed by pork, dairy, and beef. The manure production by all of these animals is immense. Manure production varies by the animal species, diet of the animal, and age of the animal. Table 3.3 presents some data comparing manure production by the major animal groups.

Table 3.3 Manure production per 1000 pounds live weight, on an annual basis.

Animal Species	Manure produced lbs./yr	Typical Handling System	Tons per Year for 1000 Animal Unit CAFO
Swine	29,000	Liquid	14,500
Poultry			
Broilers	28,000	Solid	14,000
Layers	22,000	Liquid	11,000
Turkeys	16,000	Solid	8,000
Beef	21,000	Solid	10,500
Dairy	30,000	Liquid	15,000
Humans	1,223[1]	Liquid	611

[1] Based on 150 lb avg. wt. per person producing 0.5 lb of fecal material per day

On a 1000 pound live weight basis, each of these animals produces more waste than a human. A CAFO with 1000 animal units of turkeys produces a waste load comparable to a city of 87,700 people. A dairy CAFO with 1000 animal units is equivalent to a city of 164,500 people. The important difference lies in the fact that human waste is treated before discharge into the environment, but animal waste is either not treated at all or minimally treated by virtue of the storage methods used before disposal.

3.1.1 Poultry

Poultry production (broilers, roasters, turkeys and eggs) is heavily concentrated in relatively few states. Chicken production occurs in Georgia, Arkansas, Alabama, Michigan, North Carolina, Missouri, Texas, and Delaware. Egg production occurs in Ohio, California, Pennsylvania, Indiana, Iowa, Georgia, Texas, Arkansas, and North Carolina. Turkey production occurs in North Carolina, Minnesota, Virginia, Arkansas, California, Missouri, and Texas. These states are those with the largest facilities. Other states may have CAFO sized production units, but not be among the largest. Poultry are not usually calculated as animal units due to the composition of their manure. Broiler manure has a N:P ratio of 3.6:1 and layer manure has a N:P ratio of 2.7:1. The N:P ratio of turkey manure is about 2.7:1. Poultry manure is quite high in phosphorus compared with other animal species. In some cases N and P are almost equal in concentration.

The total quantity of 120 million wet tons of poultry manure was estimated for 2001, and this figure represents an increase of more than 80 % compared to 1982. Clearly, this quantitative increase is the greatest change for all categories of animal fecal production. Some of the largest poultry operations are now located in North Carolina, Arkansas, and the Delmarva peninsula. Today, most poultry production comes from large concentrated egg or broiler operations. Delaware, as one example, may produce up to 250,000,000 chickens or more in one year. The waste generated contains more nitrogen and phosphorus than may possibly be used as fertilizer in Delaware for crop production.

Manure production and manure handling is similar in broilers and turkeys, resulting in similar nutrient concentrations. The floor is covered with moisture absorbing bedding and is ventilated. This airflow removes ammonia and other gases leaving a nitrogen-depleted manure. Broiler manure as excreted has a nitrogen content of 401 lb/yr/1,000 lbs of animal weight (USDA, 1998); broiler house litter has a nitrogen content of 27 lb/yr/1,000 lbs of animal weight (USDA, 1992). Some of this decrease in nitrogen may be explained by solubilization as when bedding is washed off the floor rather than scraped, as shown by the decrease in phosphorus and potassium from 117 and 157, respectively, to 113 and 111 lb/yr/1,000 lbs of animal weight. The much larger percent loss of nitrogen results from off-gassing of ammonia.

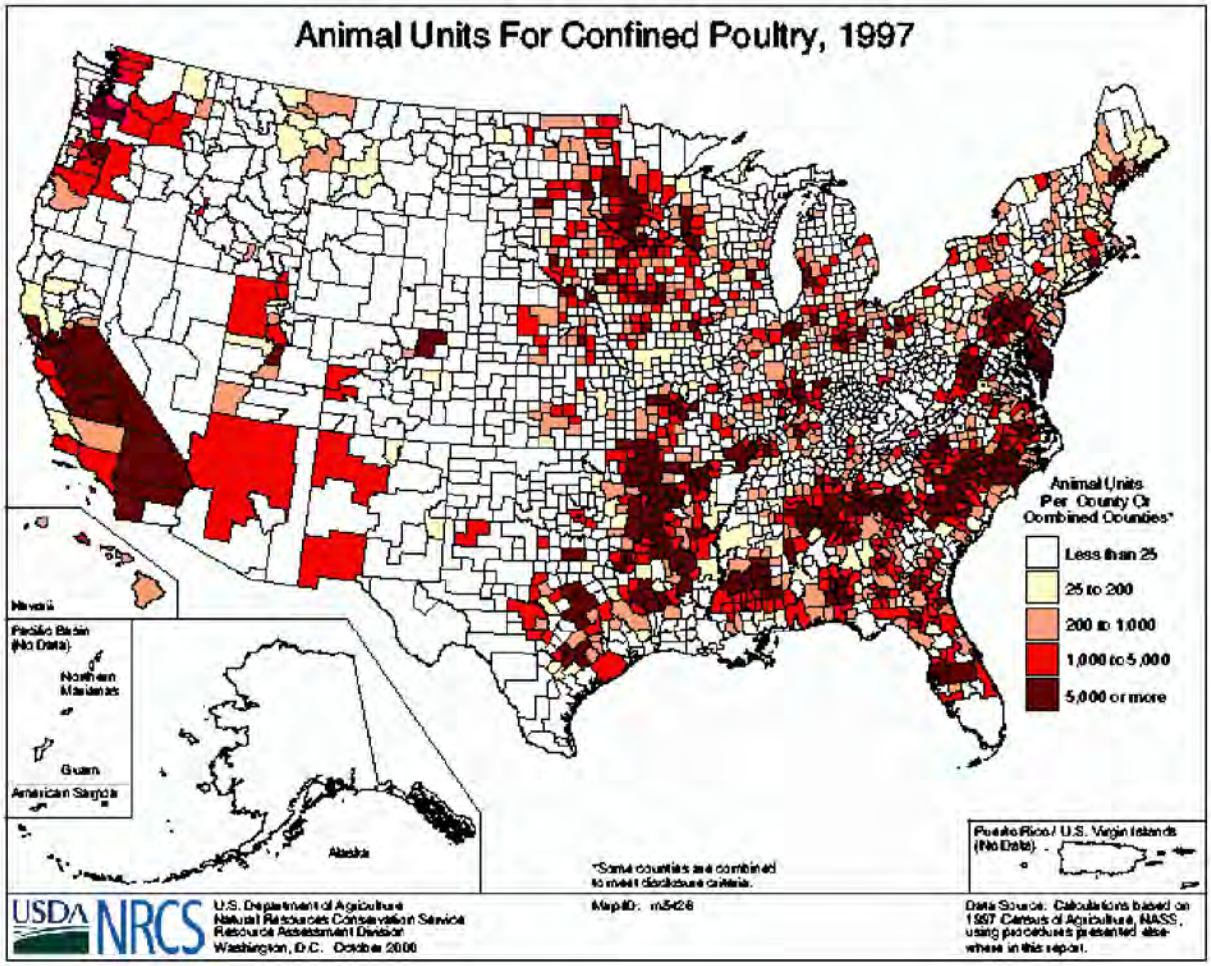

Figure 3.1. Poultry production distribution in the United States.

3.1.1.1 Broilers/Roasters and Turkeys

Broiler production in the United States was about 8.4 billion in 2001. The average cycle time for broilers is about 47 days. The total amount of waste generated by broilers is estimated at 79 million wet tons per year taking into account the cycle time of production. This estimate may be a high estimate because it does not take into account the fraction of birds sold at much lower weights for different markets. Turkey production also has multiple cycles per year. A good estimate is three production cycles of about 17 weeks each. The amount of waste generated is estimated at 21 million tons per year with three production cycles. Most waste is handled as dry rather than liquid systems.

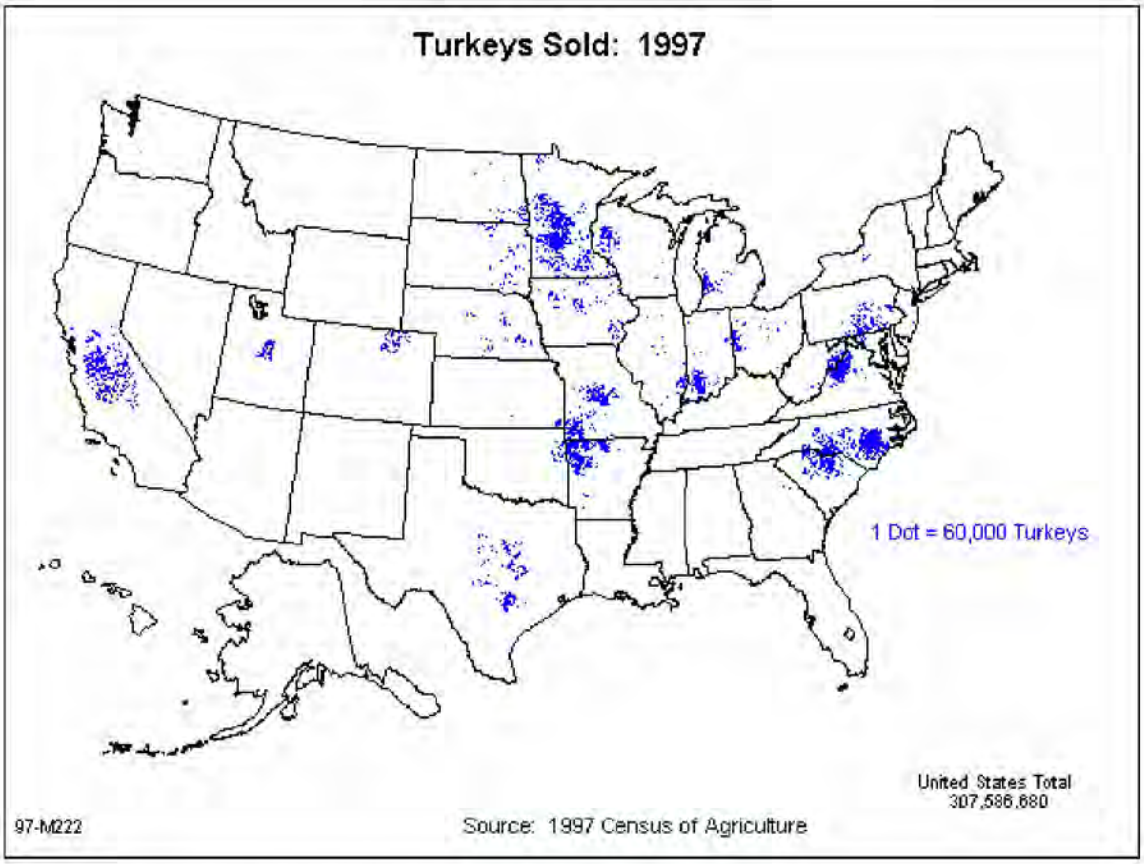

Figure 3.2. Turkey production distribution in the United States.

3.1.1.2 Layers

The estimated number of layers in the United States is about 367,000,000. The life cycle of layers is usually more than a year. The manure production by layers is estimated to be about 19 million tons per year. It is possible to have layer flocks more than one year in age before market. The apparent maximum for layers is about two years. Layer manure production often includes no bedding, it is handled as raw dried manure or water flushed manure. Water flushing manure results in dilution with concurrent increase in volume. Raw manure contains 308, 114, and 120 lb/yr/1,000 lbs of animal weight of nitrogen, phosphorus and potassium (USDA, 1998). Dry manure may lose up to 50% of the nitrogen content as volatile ammonia. Poultry manure dries rapidly and may be scraped off of flooring and stored dry in stacks or cakes. Dilution in lagoons and slurries may result in concentration reduction to as little as 10% of the raw manure value (USDA, 1992).

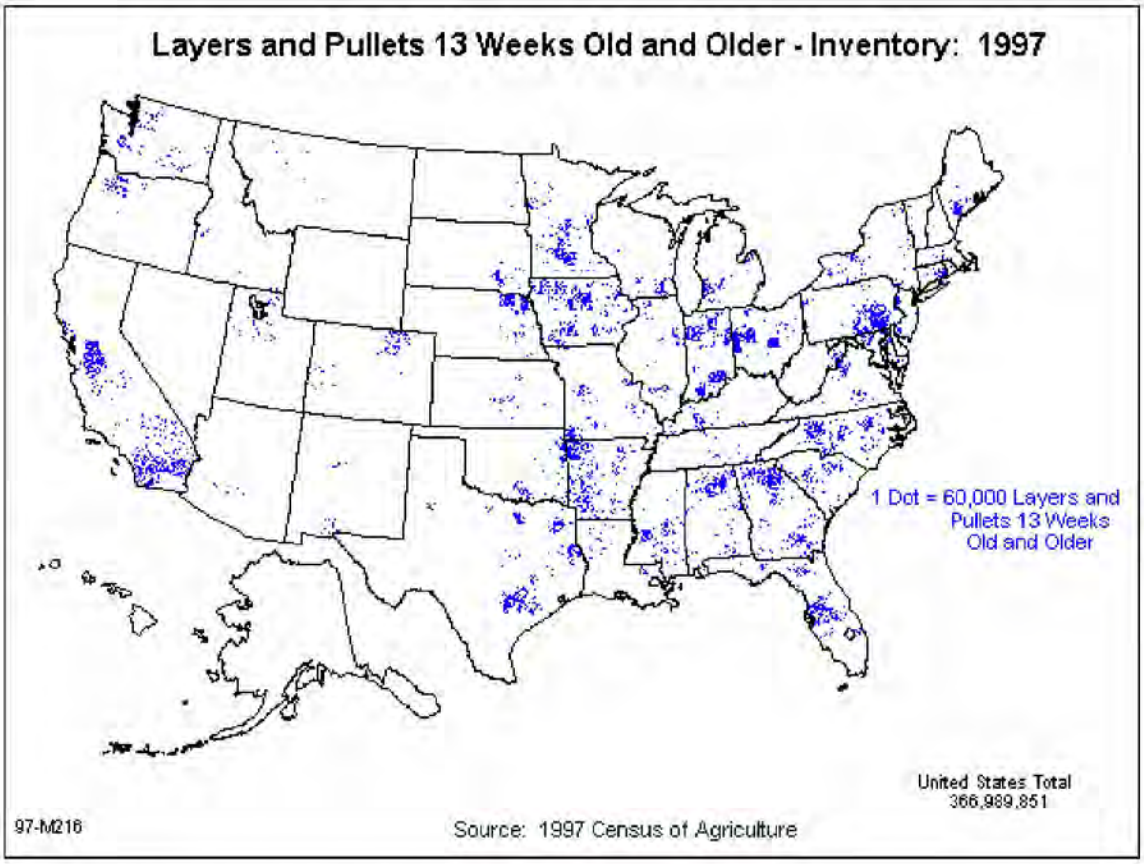

Figure 3.3. Layer and pullet distribution in the United States.

3.1.2 Swine

Hogs may live in several types of CAFOs throughout their life. Breeder facilities produce feeder pigs from birth to about 15 pounds, nursery facilities raise the pigs to 40 to 60 pounds, and grower/finisher facilities raise the pigs from 60 pounds to market weight of about 250 pounds. The total quantity of manure produced by both breeding hogs and hogs for slaughter was 177 million tons (from 8.5 million swine) and essentially this quantity was excreted in confined animal feeding operations. A variety of wet-handling and dry-handling systems were used. There has been a dramatic shift in the location of confined hog farm operations with North Carolina now being the most popular state with Iowa and Nebraska following behind. Figure 3.4 shows the change in confined animal units from 1982 to 1997. There has been a large shift to confined operations.

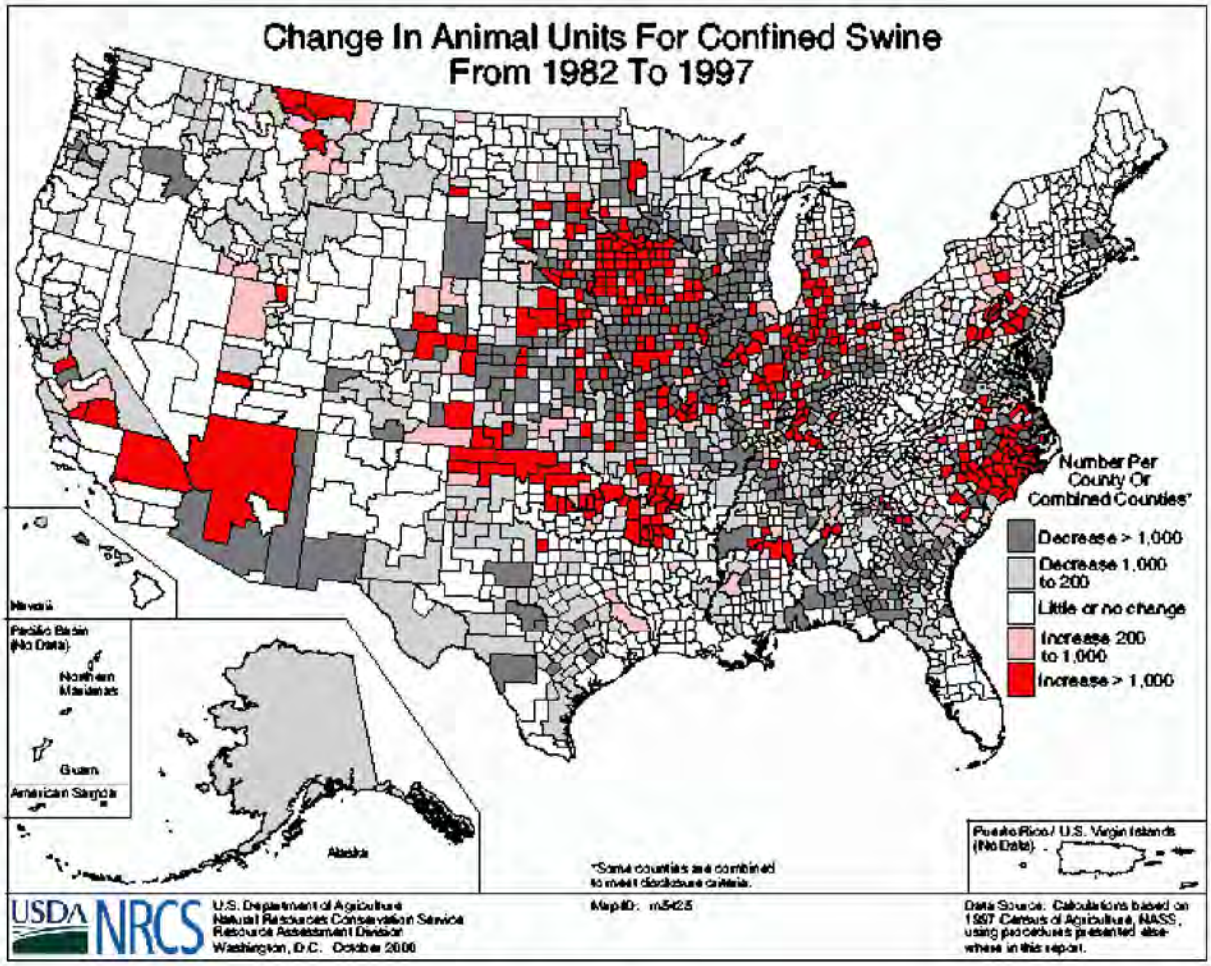

Figure 3.4. Change in swine production distribution in the United States.

Figure 3.5 shows a modern hog confinement facility with a waste lagoon. The hogs may be confined in pens as shown in Figure 3.6. In this type of facility the manure drops through the slatted floors into channels that are periodically flushed with supernatant water from the lagoon. The floors are either scraped or washed with water to move the waste into the subfloor channels. Demonstration projects have been completed wherein the lagoon is covered with a synthetic material, and the lagoon is converted to an anaerobic digester. Some farms have found it practical to recover methane from the lagoon to supply electricity and heat for the farm.

Photo courtesy of USDA NRCS.

Figure 3.5. Swine confinement barns with lagoon.

Photo courtesy of USDA NRCS.

Figure 3.6. Swine pens inside barn with slatted floors.

3.1.3 Cattle

3.1.3.1 Beef Feedlots

Beef cattle generate about 21,000 lbs of manure per animal per year, assuming one animal is one animal unit. Beef production starts with cow/calf operations that produce feeder calves for feeding operations. Calves are fed from birth to about 400 pounds. Then they are transferred to feeding operations that feed them to market weight of about 1200 pounds. Veal calves are usually male calves fed in confinement to about 450 pounds. The beef industry is located primarily in the central United States. The largest operations are in the Great Plains states, Texas, Kansas, Nebraska, and Colorado.

There has been a large shift in cattle production to the central United States as shown in Figure 3.7. Many areas have lost cattle production while Nebraska, Kansas, Oklahoma, and Texas have had great increases in cattle production.

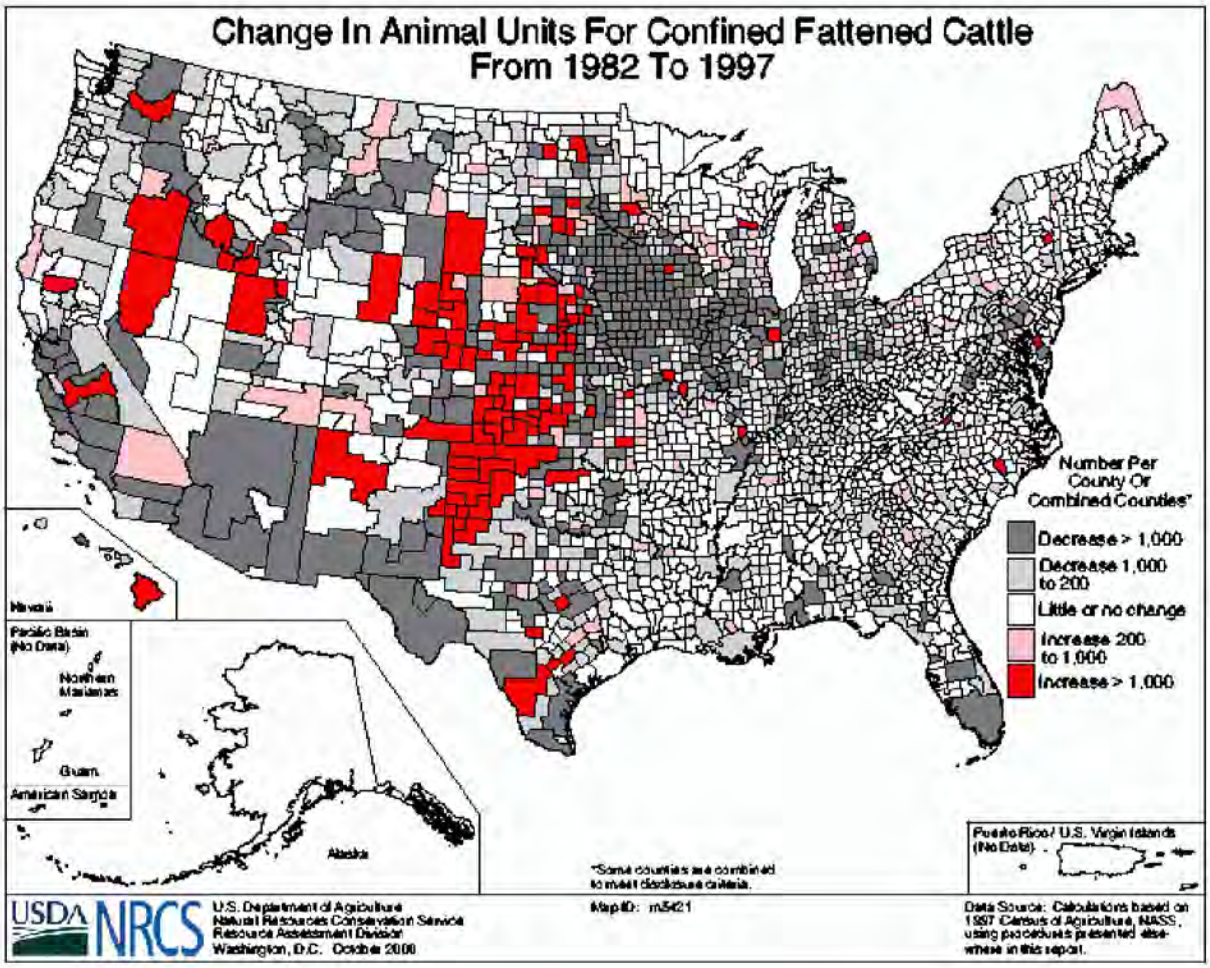

Figure 3.7. Change in cattle locations as of 1997 Census.

Figure 3.8 shows an aerial view of a large feedlot in Kansas. A waste lagoon is in the lower center of the picture. There is an area above the lagoon that appears to be the inflow area for the lagoon, but may also drain to unprotected streams. In large feedlots as shown in the figure, waste is generally scraped from the surface of the lot and piled nearby until it may be moved from the site for field application. A limited amount of treatment occurs in the piles due to self-heating of the material. Treatment by composting could be implemented relatively easily with the manure scraped from feedlots. The compost could then be sold as a value added product. The cost would be in the additional handling required to manage the composting process. Veal calf production is more likely to use a fully liquid manure system to handle wastes because the animals produce waste with higher water content and are held in confinement where water cleaning of the barns is practiced.

Photo courtesy of USDA NRCS.

Figure 3.8. Aerial view of a feedlot in Kansas with a lagoon.

Perhaps one of the most important facts for the purposes of this document is that a total of 806 million wet tons of manure were shed by beef cattle in 1997 (only 13% of this quantity was excreted within CAFOs, however). The quantity of manure produced by fattening beef cattle in CAFOs increased only 3% in the fifteen-year interval from 1982 to 1997. Beef feedlot wastes vary widely due to climate, diet, feedlot surface, animal density, and frequency of cleaning. Aged manure loses, on a dry weight basis, up to 60% of the nitrogen, 50% of the phosphorus, and 35% of the potassium (Mathers, 1972) to volatilization, runoff, or leaching.

3.1.3.2 Dairy

Dairy production is more evenly distributed due partially to the highly perishable nature of milk. Large dairy operations exist in California, New York, Wisconsin, Pennsylvania, Minnesota, Texas, Michigan, Washington, Idaho, Ohio, New Mexico, and Arizona, Texas, Idaho, New Mexico, and Arizona.

The distribution of dairy operations in the United States is shown in Figure 3.9. The highly perishable nature of milk suggests a reason for the more even distribution of dairies than beef feedlots.

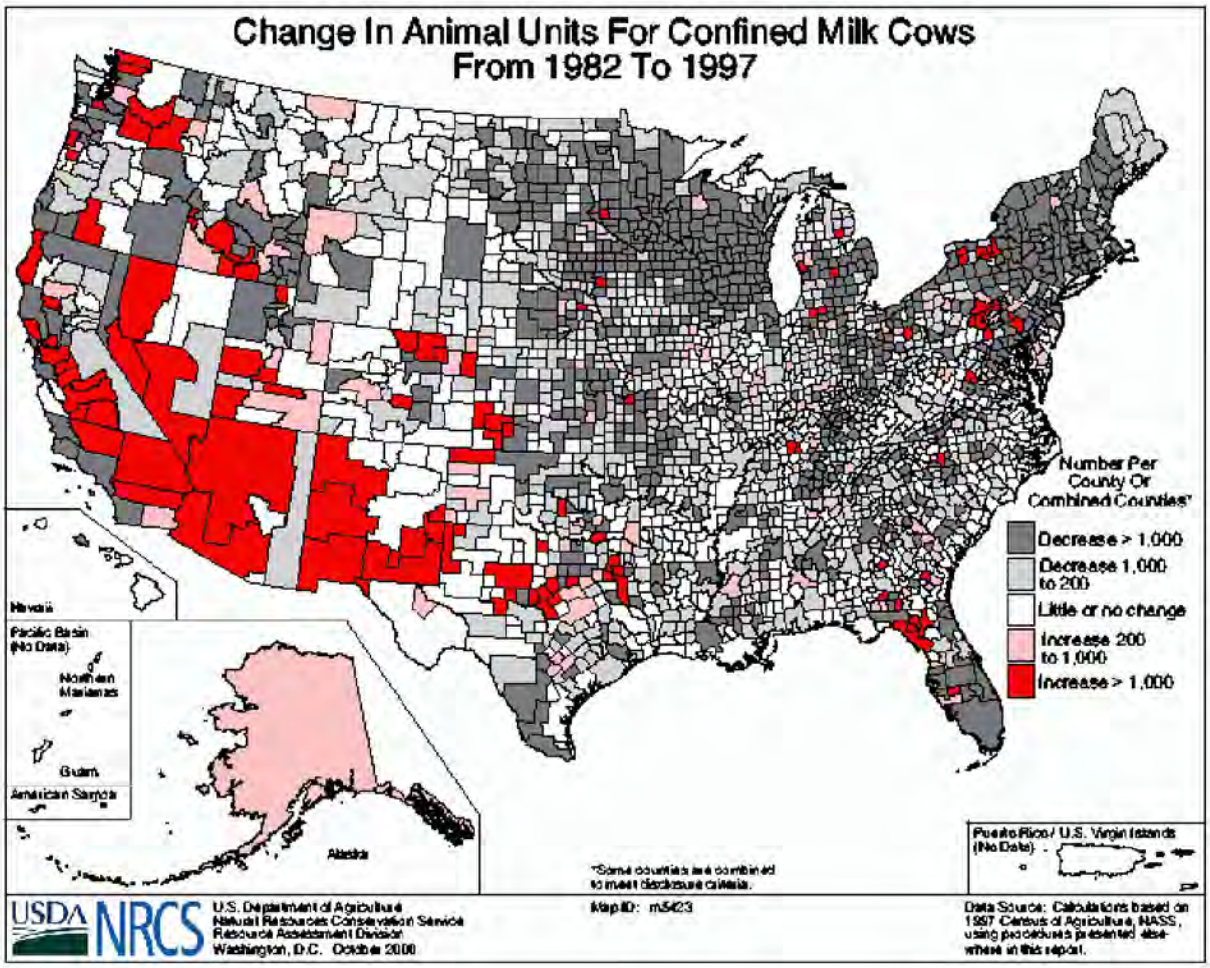

Figure 3.9. Change in distribution of dairy cattle in the United States.

Some dairies practice good control of waste both for nutrient management and for good environmental practice. Figure 3.10 shows a manure storage tank that gives the farmer good control over waste management. Tanks as shown may not be feasible for large dairies with large animal populations due to the volume of manure produced. Figure 3.11 shows a dairy farm with poor control of waste with consequent poor nutrient and environmental practices. This farm is losing valuable nutrients to runoff and possibly contaminating local streams with manure. Dairies may practice a variety of waste handling methods. Large dairies with large lot areas may handle wastes by scraping the lots and piling the waste until

Photo courtesy of USDA NRCS.

Figure 3.10. Dairy farm with manure storage tank

it may be field applied or further processed by composting. Milk house waste is frequently combined with the wash water and transferred to lagoons as a disposal mechanism separately from the feedlot waste. In this case there are two waste systems. Dairies with cows housed in barns and little or no outside activity usually have a combined waste system wherein the milk house waste, wash water and barn waste are combined in a mostly liquid system.

Dairy cattle produced 187 million wet tons of manure in 1997, representing an increase of 25% from the amount produced in 1982. Essentially this entire amount of fecal matter originated within CAFOs. Dairy manure as excreted contains on average TKN 164, phosphorus 29, and potassium 102 pounds/year/1000 pounds of animal mass (Lander, 1998). Water washed systems with lagoon storage may generate losses of 30-75% of the nitrogen (USDA 1992). The fecal matter produced within these operations was handled and disposed of under a variety of wet and dry handling systems and in some instances enclosed anaerobic digester systems have been employed so that methane gas production was optimized and then captured for conversion into electrical energy.

Photo courtesy of USDA NRCS.

Figure 3.11. Dairy farm with poor manure management and detrimental impact on the environment.

3.2 Manure Characteristics.

After the animals have defecated, the manure begins changing characteristics. Manure is a dynamic material, because it contains organic matter, nutrients, water, and microorganisms. Manure begins to lose N as NH_3 almost immediately. Between defecation and application of manure to soil, volatile N losses may be up to 90%. The N loss adversely affects the fertilizer value of the manure by reducing the N:P ratio. In most cases, conservation of the N is beneficial economically. Loss of N as NH_3 also raises an air pollution concern, as the N may be redeposited in watersheds where it becomes a pollutant. Esthetically, loss of N as NH_3 may create odor problems, leading to public disapproval of manure application, even though it is agronomically beneficial. Ammonia losses are minimized by direct injection or incorporation of manure into the soil surface. Up to 98% of N may be retained by injection. Maximum loss of N occurs when manure is applied by high velocity sprinkler systems. The sprayers maximize air exposure of the waste and consequently NH_3 loss. Phosphorus is not generally susceptible to volatility losses.

The nutrient value of animal waste varies according to animal species and waste handling systems. The nitrogen and phosphorus content of waste change greatly between excretion and field application. The urea and ammonia content of waste is especially susceptible to loss to atmosphere. This represents a potential economic loss as well as a transfer of a pollutant from one medium to another. Lagoon-based systems tend to accumulate phosphorus in the sludge layer on the bottom. Periodic removal of the supernatant disperses the N and P in the liquid phase. Eventually, the sludge layer will have to be removed to regain storage capacity. Due to the increased P content relative to the supernatant, the land area required

for disposal will be greatly increased to prevent overloading with P. Examples of waste nutrient content are shown in Table 3.4.

Table 3.4. Nitrogen and Phosphorus Content of Animal Waste

Species	As excreted, lb/1000 lb/year		As applied, lb/1000 lb/year	
	N	P	N	P
Swine	54-228	18-168	17-20	17-22
Poultry, broiler	310-401	71-124	109	112, stockpile
Poultry, layer	264-315	99-113	238	94,pit
Turkey	204-270	84-120	102-132	82-102
Dairy	150-164	29-60	117	35
Beef	99-124	24-116	77	23-51

The wide range of nutrient content observed reinforces the need for the individual CAFO operator to have periodic manure analyses done. An annual analysis will provide adequate information for planning application for crops.

3.2.1 Physical Properties

The physical properties of manure produced by the main commercial animal species have some common and some individual characteristics. Poultry manure is drier upon excretion than manure produced by any other common species. The characteristics of manure of most interest for the purposes of this document include the moisture content, nutrient content, COD, and BOD representative of the different animal manures. Table 3.5 summarizes basic data on manure characteristics.

Table 3.5. Characteristics of animal manure based on 1000 pound live weight.

	Lbs/day	% water	Total solids	Volatile Solids	BOD5	N	P	K
Dairy	82	87	10.4	8.6	1.7	0.41	0.17	0.33
Beef	60	88	6.9	6.0	1.6	0.34	0.25	0.29
Swine Finisher	132	91	6.0	4.8	4.79	0.45	0.33	0.36
Layers	52.5	75	13.25	9.25	3.5	0.75	0.625	0.35
Broilers	70	75	18.0	12.5	1.15	1.2	0.615	0.45
Turkey	47	74	12	9.1	2.1	0.68	0.24	0.27
WWTP Influent	3.35	80 est.	2.7	1.2	1.7	0.25	0.17	na

The effects of excess nutrient release into the watershed may cause eutrophication of water bodies with consequent degradation of potential uses of the water. Harmful organisms may bloom in response to the nutrient input causing problems with fisheries and human health. And in the case of the Mississippi River ammonia inputs to the Gulf of Mexico have led to the development of extensive anoxic zones. Control of nutrient loss is important to management of animal wastes.

3.2.2 Nutrient Content and Form from Poultry

3.2.2.1 Layers, Broilers, and Turkeys

Poultry is made up of three sub-types: layers, broilers, and turkeys. Broilers and turkeys are fed to optimize growth and development, while layers are fed to maximize egg production. Manure produced by these groups reflects these differences as well as differences in housing practices.

Manure production and manure handling is similar in broilers and turkeys, resulting in similar nutrient concentrations. The floor is covered with moisture absorbing bedding and is ventilated. This airflow removes ammonia and other gases leaving a nitrogen depleted manure. Broiler manure as excreted has a nitrogen content of 401 lb/yr/1,000 lbs of animal mass (USDA, 1998); broiler house litter has a nitrogen content of 27 lb/yr/1,000 lbs of animal mass (USDA, 1992). Some of this decrease in nitrogen may be explained by solubilization as when bedding is washed off the floor rather than scraped as shown by the decrease in phosphorus and potassium from 117 and 157, respectively, to 113 and 111 lb/yr/1,000 lbs of animal mass. The much larger percent loss of nitrogen results from off-gassing of ammonia.

3.2.2.2 Layers

Layer manure production often includes no bedding, and it is handled as raw dried manure or water flushed manure. Water flushing manure results in dilution with a concurrent increase in volume. Raw manure contains 308, 114, and 120 lb/yr/1,000 lbs of animal mass of nitrogen, phosphorus, and potassium (USDA, 1998). Dry manure may lose up to 50% of the nitrogen content as volatile ammonia. Poultry manure dries rapidly and may be scraped off from flooring and stored dry in stacks or cakes. Dilution in lagoons and slurries may result in concentration reduction to as little as 10% of the raw manure value (USDA, 1992).

3.2.2.3 Nutrient Content and Form from Swine

Swine manure is typically collected in lagoons, pits, or both (Svoboda 1995). Nitrogen loss in the water fraction of the lagoons due to aeration may be as much as 76-84% of the original nitrogen content. Phosphorus and potassium losses to accumulation in sludge may be 78-92% of the phosphorus and 71-85% of the potassium (Jones and Sutton, 1994). The phosphorus and potassium lost from the aqueous stream are found in lagoon sludge.

Generally speaking, boars and larger swine produce manure with a higher nutrient content. Values reported here are for grower-finisher operations as these are more representative of the life-long manure production of the swine. Typical values are nitrogen, 166; phosphorus, 48; and potassium, 117 lb/yr/1,000 lbs of animal mass. Water-washed floors result in wet manure, which is often stored in lagoons.

3.2.2.4 Nutrient Content and Form from Cattle

3.2.2.4.1 Dairy

Average dairy manure as excreted contains TKN 164, phosphorus 29, and potassium 102 lb/yr/1,000 lbs of animal mass (Lander, 1998). These wastes are typically water-washed and stored in lagoons with concurrent loss of 30-75% of the nitrogen content (USDA, 1992).

3.2.2.4.2 Beef

Beef feedlot wastes vary widely due to climate, diet, feedlot surface, animal density, and frequency of cleaning. Feedlots are typically scraped and the resulting waste is stored on the ground. Aged manure loses, on a dry weight basis, up to 60% of the nitrogen, 50% of the phosphorus, and 35% of the potassium (Mathers, 1972) to volatilization, runoff, or leaching.

3.3 Manure Management Practices

3.3.1 Wet Manure Management

Liquid or slurry systems include wet barn washing, under-building or lagoon storage followed by spray application, injection, or gate and channel application onto the land. Liquid manure systems handle material with solids content below 10%. Gravity flow systems work well for movement of wastes from production to storage facilities, such as lagoons. Operations that require pumping to move wastes should have solids content of less than 4%. Liquid wastes are amenable to treatment in digesters. The digesters may be well engineered and controlled systems to increase efficiency, or enhanced lagoon storage to enable a lower intensity treatment, with longer treatment time. These systems are most amenable to recovery of fuel value from methane production. Swine and dairy operations commonly use wet manure management and are therefore potentially at risk from nitrogen percolation to groundwater and airborne stressor transport, especially if wastewater is sprayed. Liquid systems are described in more detail in the land application section.

3.3.2 Dry Manure Management

Solid manure systems include mechanical scraping of waste to clean out barns, pile storage and land application using a manure spreader, either truck-mounted or tractor-drawn powered spreaders. Dry systems include the manure plus any bedding material used. Typical bedding may be wheat straw, corn stover, corn cobs, sawdust, or any absorbent material. The bedding material absorbs water and changes the C:N ratio of the manure. The resultant material may then be suitable for composting with little need for adjusting carbon content.

Poultry and beef feedlot operations use dry manure management and so are more at risk from phosphorus application to land. Many CAFOs occupy only enough land for their day-to-day operations. The amount of manure produced in the CAFO may well exceed the capacity of the available land to absorb it. This is especially true when applications are based on phosphorus needs of crops rather than nitrogen. Offsite manure transfer may be a valuable way to expand the disposal area available. However, adequate record keeping and nutrient management is essential to avoid excess application to fields.

Typically, the smaller operations use familiar manure spreaders to distribute the manure in farm fields. Manure is loaded from the barn using a tractor-mounted scoop into a power driven spreader box or flail spreader. The spreader is driven to the field and the load distributed onto the land. The solid spreaders handle manure that is about 20 to 25% dry material, sometimes less. The material may be stacked with little or no liquid seepage. This type of manure is most easily treated by composting, should treatment be required before distribution. Incorporation of manure should be done as soon as possible after application to ensure N retention. Incorporation may not be done if the manure is applied to standing crops. The primary benefit of this system is relatively low cost for equipment. Evenness of distribution is not easily obtained. Timing of application is not generally done with nutrient management in mind. The small operator spreads

manure when other activities are not pressing. Common times are: fall after harvest of corn and soybeans, winter, spring after planting is done, and summer after wheat is harvested. The largest risk would come from the winter application on frozen soil. Incorporation would not be feasible, and upon spring thaw and rainfall, runoff could produce significant losses of material to receiving water.

4 WATERSHED STRESSORS IN CAFO WASTE

The pollutants potentially leaving the CAFOs may affect watersheds directly or indirectly. The most often cited stressors affecting watersheds include nutrients, pathogens, sediments, EDCs, antibiotics, and metals. Direct effects occur when wastes flow directly into a receiving water as a result of poor storm water management or catastrophic failure of containment facilities. Indirect effects occur when wastes have been applied to a field and are subsequently moved into waterbodies by runoff after rainfall, percolation into groundwater with subsequent entry into streams or tile drain lines, wind driven movement, or volatilization and redeposition as in the case of ammonia.

The nutrient content of the manure generated on the CAFO is one of the most significant problems. Nitrogen in the waste may be transferred in the environment two ways. Ammonia may be volatilized from the waste directly into the air and generate odor and downwind deposition problems. Nitrate generated in the soil applied waste may enter surface or groundwater and may exceed the national drinking water limit of 10 mg/L to cause health problems in young children.

Phosphorus in waste may easily exceed crop requirements for a given year on a localized basis. If continual applications are made year after year, the soil becomes saturated with P and the potential for runoff losses and groundwater losses greatly increase.

The soil, if eroded will contribute to stream degradation by eutrophication. Erosion of soil onto which manure has been applied, may contribute to other environmental problems in waterbodies. Organic matter exerts an oxygen demand leading to a depression of dissolved oxygen. Solids, as either manure particles or eroded soil particles, increase the sediment load in streams and may unduly shade some parts of the stream. Other habitat effects will be associated with increased sediment load.

Microorganisms associated with manure may present a significant risk to health. The population of several known pathogens may be quite high in manure. Runoff from land application sites may carry large numbers of organisms into streams. Recreational use of the streams may then bring people into direct exposure to large numbers of potentially pathogenic microorganisms. Several disease outbreaks have been associated with manure contamination of water or food that has been contacted by manure.

There are also concerns associated with the potential metal content of poultry or swine waste. Trace levels of arsenic are added to poultry feed to promote growth. Similarly, copper is added to swine feed for growth promotion. Antibiotics, hormone compounds, and pesticides are found in animal wastes, and the environmental effects of these compounds are largely unknown. The following sections are meant to summarize the most pertinent literature concerning nutrients and other stressors from CAFO manure. The literature in the area of nutrients and nutrients as pollutants is overwhelming. This is an attempt to limit the literature review to the citations that have the most impact on EPA's mission.

4.1 Nutrients

"Livestock wastes, which for present purposes are defined as liquid and solid excreta with the associated remains of bedding and feed and sometimes with water added, have long been ranked among the farmer's most valuable resources. For traditionally, the fertility of his land has depended in very large measure on the supply of such waste, sometimes dropped in his field by grazing animals or sometimes

stabilized in the steading into farmyard manure by the addition of straw. In the days of the agricultural revolution the efficiency of the yards as a '*manure factory*' was one of the primary criteria of farmstead design. More recently and more drastically, a variety of agricultural changes have combined to convert, under certain circumstances, this potential asset (manure) into an increasing liability. The agricultural changes result from growing economic pressures to increase the animal outputs by an increase in the number of livestock carried per unit of land." (ARC 1976)

4.1.1 Nitrogen

Animal waste contains nitrogen in organic and inorganic forms. The inorganic form is ammonia, and organic forms include urea and an array of organic compounds. Nitrogen compounds may move in a watershed in air, surface runoff, or through percolating groundwater. Any form of nitrogen may have an impact on a watershed because it is a major plant nutrient. Ammonia is immediately available to plants as ammonium ion. Ammonia may move as an air pollutant after volatilization from animal waste. In the soil, ammonia enters solution as ammonium ion that may be held on soil colloid exchange sites. Ammonium is formed when organic-N such as urea is metabolized either aerobically or anaerobically to NH_3 that ionizes in water to ammonium. Ammonia may lead to eutrophication, excessive oxygen demand in surface waters and fish kills, reduced biodiversity, objectionable tastes and odors, and growth of toxic organisms. Both forms of ammonia, NH_3 and NH_4^+, are toxic to aquatic life, although NH_3 is more toxic to fish. Ammonia may be converted by nitrification to nitrite and nitrate. Nitrite is toxic to fish and most aquatic species. Nitrite does not accumulate in the environment because it is rapidly oxidized to nitrate naturally by aerobic bacteria. Nitrate is highly mobile and may easily leach downward through the soil profile to an aquifer. Nitrate is the most widespread agricultural contaminant in drinking water wells (U.S.EPA, 1998). A drinking water maximum contamination level (MCL) of 10 mg/L has been set for nitrate-N based upon its role in the "blue baby syndrome" or methemoglobinemia. Nitrate may be converted to nitrite by nitrate reducing bacteria found in the low acidity infant stomach. Nitrite may then attaches to fetal hemoglobin in human infants forming methemoglobin, which is ineffective as an oxygen carrier. This toxicity, if not treated, may be fatal (Goldstein et al., 1974). Figure 4.1 depicts processes primarily responsible for transformation of nitrogen compounds in sediments at the bottom of lagoons (collection ponds) or in a topsoil layer treated with animal manure.

Soil profile characteristics and management practices may significantly affect leaching of nitrate and ammonium in feedlots and crop fields (Saint-Fort et al., 1995). Whereas runoff is the primary mechanism for the transport of sediment bound and solution phase ammonium, groundwater flow is the primary contributor of nitrate to surface water from agriculture. (Follet, 1995). Spatial variability of nitrate in ground water and temporal fluctuation are related to seasonal recharge and hydrologic variations in the region (Halberg, 1986). High concentrations of nitrate in groundwater are associated with high permeability soil and aquifer material, such as permeable sand and gravel, karst limestone, or fractured rock (Hitt et al., 1999). In these landscapes, manure applied as fertilizer is susceptible to relatively rapid infiltration, thus contaminating ground water with nitrogen and/or phosphorus.

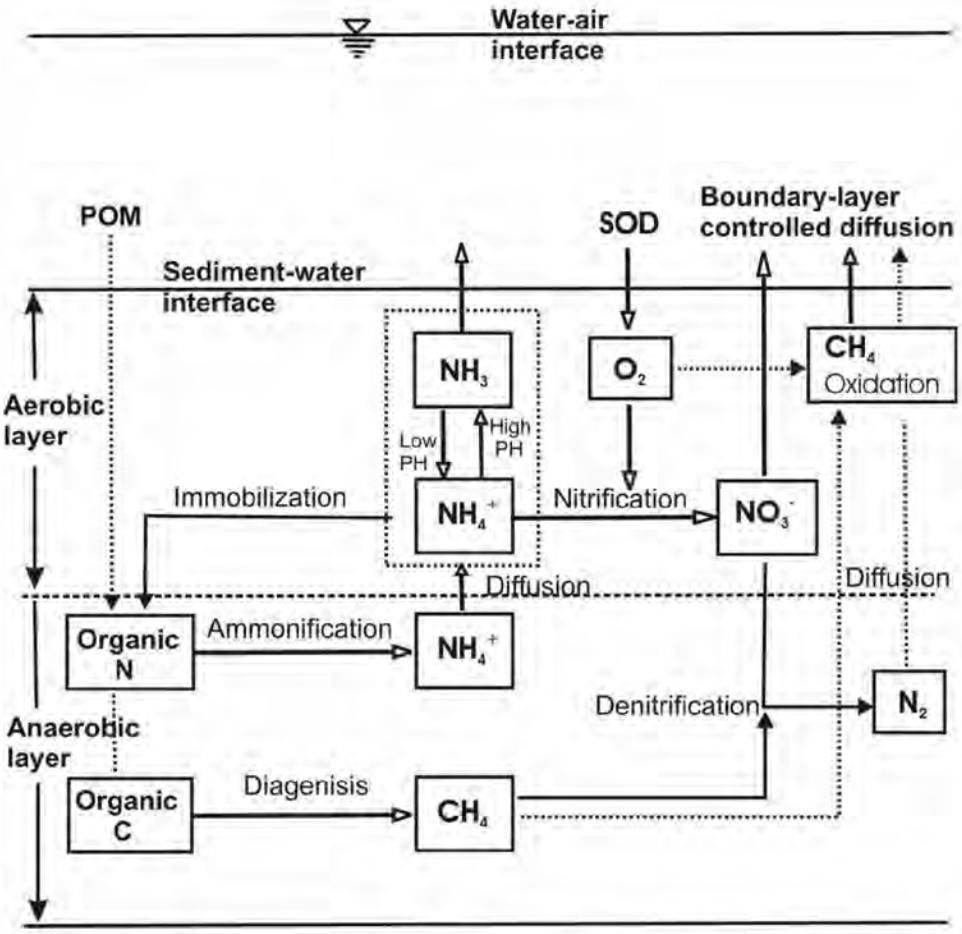

Figure 4.1. Depiction of carbon and nitrogen cycles in soils or sediments.

Leaky lagoons and below grade storage facilities are potential sources of nitrogen compounds that may enter groundwater. As structures age, the integrity of the walls and bottoms of the lagoon may be penetrated by burrowing animals, or the lagoon walls and bottoms may develop cracks from wetting and drying cycles as the water level in the lagoon changes (U.S. EPA, 2001). Rupture of lagoon seals may be attributed to drying of exposed embankments when lagoon levels drop or gas release from microbial activity in soil beneath the seal (Ciravolo et al., 1979: Parker et al., 1999). Short-circuits to natural filtering, such as uncapped or improperly capped wells and infiltration in vegetated filter strips adjacent to lagoons are potential sources of groundwater contamination (U.S. EPA, 2001). Groundwaters in areas of sandy soil, karst formations, or sinkholes are particularly vulnerable to nitrogen infiltration. Leaching of ammonia compounds is generally not a significant transport mechanism, because ammonium may be sorbed to soils, fixed by clay minerals and organic matter, or transformed into organic forms by soil microorganisms through the process of immobilization (Follet,1995). Mineralization is a process whereby organically bound nitrogen is converted to inorganic mineral forms, (NH_4^+ and NO_3^-). Legume crops may fix atmospheric nitrogen by transforming (N_2) to ammonia. Ammonium adsorbed onto soil below liners in abandoned dry lagoons, through nitrification, may produce nitrate (Ham, 1999) that is potentially available for leaching into the deep subsoil and ground water. Two modes may dominate transport of pollutants in soils: 1) rapid advection through macropores; and 2) slow percolation through the soil matrix. The first transport mode, which is promoted by gravitational forces through macro-channels, is also referred to as preferential flow (Figure 4.2). The second mode is much slower and is governed by gravity drainage and capillary forces at

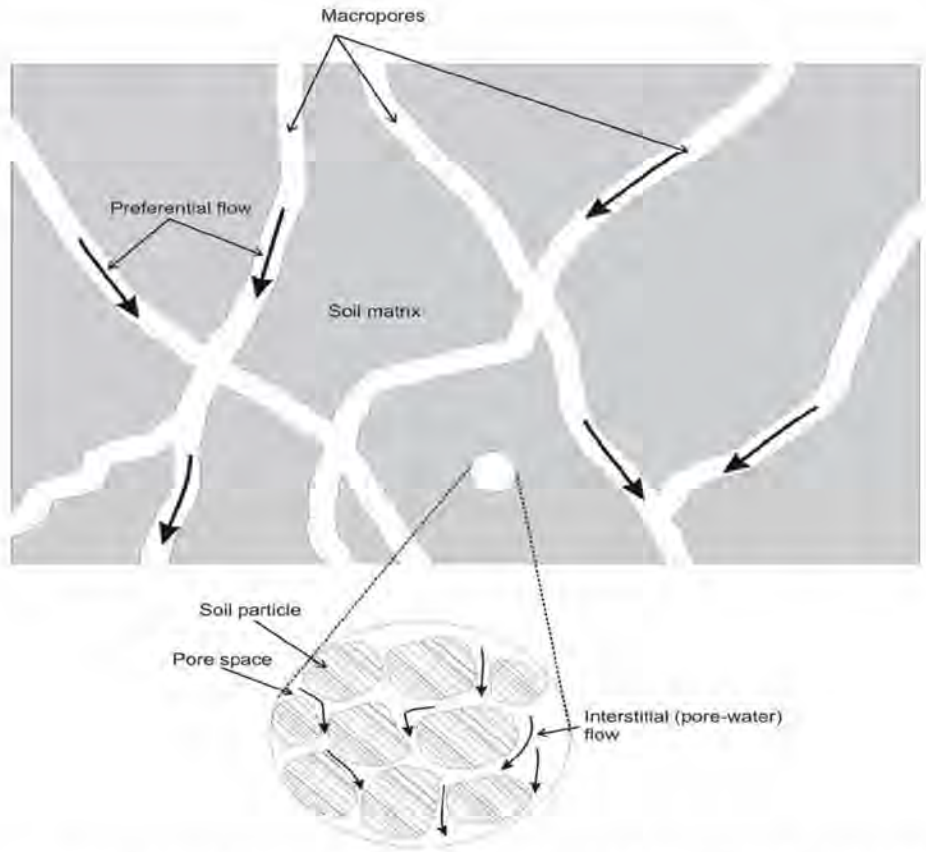

Figure 4.2. Diagrammatic illustration of preferential flow through macropores and interstitial (pore-water) flow in the soil matrix.

work through interstitial pore space. Preferential flow through macropores in soils beneath a waste lagoon may transport NH_4^+ or nitrate to ground water. Subsurface runoff and tile drainage are other transport pathways for nitrogen to surface waters.

Percolating water and leachate below lagoons may transport nitrate to ground water. Preferential flow through macropores and karst formations are also transport pathways to ground water. In heavily tile-drained watersheds most of the N added to surface water originates from tile drainage (Kovacic et al., 2000). In some areas nearly half of the applied fertilizer nitrogen may be discharged with tile-drainage water (Kanwar et al., 1983).

Nitrogen retention in the soil by adsorption of NH_4^+ onto soil colloids may constitute a source of NO_3^- to ground water (Ham, 1999). Urea and organic forms of N are also susceptible to leaching to ground water. Under anaerobic conditions, nitrate may be reduced to N_2 by denitrification, a primary process in reducing nitrate in ground water (Crandall, 1999). Denitrification occurs in the absence of dissolved oxygen and in the presence of chemically reduced compounds such as organic carbon or some divalent metals.

4.1.2 Phosphorus

Phosphorus exists as both organic and inorganic forms in animal waste. Inorganic phosphate in manure is easily adsorbed to soil particles, and thus has limited leaching potential. Organic P compounds are generally water soluble and subject to leaching (Sweeten, 1991).

Organic phosphate may easily be metabolized to inorganic phosphate that is the form that is useful as a nutrient. Inorganic phosphate in surface water is a major contributor to eutrophication. Because most surface water plant and algal growth is rate limited by phosphate level, pollutant phosphate is of particular concern. In concentrations over 1.0 mg/L phosphate may inhibit floc formation in drinking water treatment plants (Bartenhagen et al., 1994).

Phosphorus is much less susceptible to leaching because of its adsorption onto soil particles and therefore, poses less of a threat to groundwater than nitrate. Adsorption-desorption reactions in the soil regulate the rate at which P may be released (Siddique et al., 2000). Phosphorus accumulation in topsoil from animal waste and fertilizers constitutes a sediment problem more than a groundwater problem because P binds to the most erodible soil components (clay, organic matter, and oxides of Fe and Al)(Sims et al., 1998). However, if continual applications are made year after year, the soil becomes saturated with P and the potential for runoff losses and groundwater losses increases greatly. Phosphorus leaching may occur in sand soils where over-fertilization and/or excessive use of organic waste have increased soil P levels in excess of crop requirements (Sims et al., 1998). Preferential flow through macropores (e.g. soil cracks, root channels, earthworm borrowings) may transport a significant part of the phosphorus by suspended soil material to tile drains (Øygarden et al., 1977). Leaking from lagoons is also a likely source for groundwater contamination by phosphorus.

Environmentally significant export of anthropogenic P from agricultural soils by subsurface runoff begins with downward movement of P, either by slow leaching through the soil profile or preferential flow through macropores (e.g., soil cracks, root channels, earthworm borings). Dissolved inorganic P concentrations in subsurface runoff in artificial drainage systems may be higher than values associated with eutrophication of surface waters (Ryden et al., 1973, and Sims et al., 1998). P leaching may occur in deep sand soils, in high organic matter soils, and soils where over-fertilization and/or excessive use of organic waste have increased soil P values well above those required by crops. Leaching potential of P increases in soils with low concentrations of soil constituents that are primarily responsible for P retention, such as clays, oxides of Fe and Al, and carbonates (Sims et al., 1998). Mineralization of organic P and preferential flow through macropores and cracks caused by conservation tillage systems increase P concentration in drainage waters, including sediment-bound P.

4.1.3 Mineral Salts

Mineral salts of major concern in animal waste include the cations sodium, calcium, magnesium, and potassium and the anions: chloride, sulfate, bicarbonate, carbonate, and nitrate. These mineral salts, when applied repeatedly, may accumulate and increase soil ionic strength to levels that are toxic to plants and animals. Runoff may contribute to surface water salinization and leaching salts may affect ground water quality. Trace elements such as arsenic, copper, selenium, and zinc are often added to animal feed as growth stimulants and biocides. These when land applied may accumulate and adversely effect both human and ecologic health.

4.2 Pathogens

Animal manure is a potential source of pathogens. The organisms of concern in animal waste may be bacteria, fungi, protozoa, viruses, or worms. When released into the environment, these organisms may adversely effect human and animal populations. Although CAFOs are not the only source of these microorganisms, they are a major source of pathogenic contamination in most watersheds (Pell, 1997). Indeed, of the water bodies evaluated by the states, as required by the Clean Water Act, 36% of rivers were

unfit for swimming and/or fishing as the result of pathogenic contamination largely attributed to CAFO operations (USEPA, 2001). In addition, the source waters from which drinking water is obtained for up to 43% of the United States comes from waters that are impaired by pathogenic contamination from CAFO operations (USEPA, 2001). About 15% of the population of the United States obtains drinking water from individual wells. When wells are located in areas hydrologically connected to CAFO operations, individuals using these wells may be exposed to pathogenic organisms present in the groundwater. Without purification, this may result in illness. CAFOs are likely to release pathogens into the environment for several reasons. First, because of the large number of animals kept in CAFO operations, the likelihood that one or more of the animals is infected with one or more pathogens is very high (Clinton, et al. 1979, Pell, 1997, Wesley et al. 2000). Second, because of the large volume of waste produced, manure may not be disposed of on-site in such a way that the pathogens will be killed or inactivated. Without treatment to reduce pathogen loads, storage and disposal practices will only serve to disseminate the microorganisms more widely in the environment.

Conventional water treatment is adequate to prevent the entry of bacterial contaminants into public drinking water supplies. Protozoan contaminants are usually in the form of cysts that are very resistant to chlorination. Drinking water treatment needs to be designed and operated properly to remove *Cryptosporidium* oocysts (Patania et al., 1995). Filtration through sand filters is usually necessary to remove protozoan cysts.

For the purpose of this RME only selected pathogenic organisms known to have a significant impact on human health or the environment and that are likely to come from CAFOs will be discussed. Before beginning a detailed discussion of these organisms, however, we will first discuss pathogenic organisms in general, their effects when released into the environment, and finally, relate the organisms to the CAFO species that is most likely the reservoir for each organism.

4.2.1 Pathogens of Concern at CAFOs

More than 130 microbial pathogens have been identified from all animal species that may be transmitted to humans by various routes (USDA, 1992; USEPA, 1998). Of these, 24 pathogens are likely to originate from animal populations. Historically, fewer than ten have caused significant disease outbreaks among humans. Potential environmental exposure to human populations extending beyond animal handlers exists for cryptosporidiosis, giardiasis, campylobacteriosis, salmonellosis, colibacillosis, leptospirosis, listeriosis, and yersiniosis; and many large-scale outbreaks have been attributed to each of these pathogens. Pathogens include bacteria, fungi, viruses, helminths (parasitic worms), and protozoa. Not all pathogens are present at every CAFO. Understanding the distribution of pathogenic organisms makes it easier to design strategies that will reduce risk. Table 4.1 lists commonly occurring diseases and the animals that are associated with these diseases. A general discussion of each of these classifications follows.

4.2.1.1 Bacteria

Bacteria are single-celled, prokaryotic microorganisms that are capable of causing disease in larger organisms, although most bacteria are non-pathogenic. They may grow and proliferate within higher organisms and are shed in feces. The presence of large volumes of feces in and around animals in CAFOs provides a breeding ground for many bacteria. The bacteria that have been shown to have the widest environmental impact when released into the watershed include *E.coli* 0157:H7, *Salmonella*, *Campylobacter*, *Yersinia*, and *Listeria*. The primary concern is that disease outbreaks may occur after

Table 4.1 Diseases and animals commonly identified as sources of the causative organisms.

	Hogs	Poultry		Cattle	
Disease		Turkeys	Layers	Beef	Dairy
Colibacillosis				*	*
Salmonellosis	*	*	*	*	*
Campylobacteriosis		*	*	*	*
Listeriosis				*	*
Yersiniosis	*				
Protozoa				*	*
Cryptosporidiosis				*	*
Giardiasis				*	*
Fungi					
Viruses	*	*	*	*	*
Helminths					
Endotoxins	*	*	*	*	*

contact with these organisms via swimming, eating shellfish, eating contaminated food, or drinking contaminated water.

4.2.1.2 Fungi

Fungi are either single celled organisms or multicelluar, eucaryotic organisms that may cause disease in other organisms. Fungal diseases are commonly difficult to treat and may persist for long periods of time. Common diseases include candidiasis, histoplasmosis, aspergillosis, and dermatomycosis.

4.2.1.3 Viruses

Viruses consist of nucleic acid molecules packed within a surrounding protein coat. Viruses only actively replicate when they have invaded a host cell. The virus genes take over the host cell metabolism to make more virus particles at the expense of the host cell. There is some evidence that reoviruses and many enteroviruses may be transmitted from animals to man. Also, a number of rotaviruses are known to cause diarrhea in both cattle and humans. Among farm workers, vesicular stomatitis is frequently transmitted from sheep to humans, and the potential spread of cow pox virus (vaccinia) to humans was the basis for the classical immunological practice of vaccination. Present day surveys indicate that rabies is more likely to be transmitted from cattle to man than from either cats or dogs. At this time much less specific information is known about the actual transmission of viral diseases from livestock to humans.

4.2.1.4 Helminths

Intestinal parasitic worms occupy space in the host organism's intestinal tract. The worms absorb nutrients from the host and thereby create a burden on the host. The prevalence of worms has declined in the United States. Transmission is frequently through oral-fecal routes or from exposure through food contaminated with manure.

4.2.1.5 Protozoa

Cryptosporidium parvum: Among humans cryptosporidiosis is caused by the protozoan parasite, and it has recently been determined that there are two separate genotypes, Type 1 (human) and Type 2 (bovine), that can cause human infections. For the Type 2 genotype, the infective dose may vary from 10 to

1000 oocysts and infection is generally more severe in children and immuno-compromised individuals. Virtually all cattle herds carry some level of cryptosporidiosis, and persistence and spread in the environment is aided by passive transfer from rodents and birds. Infected animals can shed more than one billion oocysts per gram of manure. Many large-scale waterborne outbreaks have occurred in the United States. Conventional drinking water disinfectants such as chlorine and chlorine dioxide are not effective in killing *C. parvum.* The standard water treatment processes of coagulation, flocculation, and filtration are thought to be effective in removing this parasite when operating normally.

Giardia lamblia: Giardiasis among humans may be traced to many possible sources including foodborne and waterborne transmission. It has been estimated that 2% of the population has been infected with this organism, and more outbreaks result from a waterborne origin than those caused by contaminated food sources. Wild animal populations such as deer, beavers, and bears may be the cause; however, more than 50% of dairy and beef cattle herds in the United States are infected with this organism. Infection may result from ingestion of only one oocyst, and once diarrhea occurs it may last up to two weeks. An ELISA assay for the detection of oocysts is readily available, and a vaccine for giardiasis is available for dogs and cats.

4.2.2 Disease Descriptions

Some of the diseases involved in significant waterborne disease outbreaks are summarized below.

Enterohaemorrhagic Colibacillosis (Escherichia coli (EHEC) O157:H7). There are many serotypes of *Escherichia coli* from animal sources that may infect humans. This group of diseases is referred to as colibacillosis. CAFOs, specifically cattle operations, may be sources of the organisms. However, among the various enteropathogenic and enterotoxigenic forms, *E. coli* O157:H7 clearly has the most serious manifestations. The hemorrhagic-toxigenic symptoms may often lead to death in 5-7% of infected individuals. The infective dose is thought to range between 10 and 1000 organisms. Contamination with cattle feces is known to be the most likely source of infection in the U. S. with foodborne infections ranking highest; however, waterborne and recreational exposure is also associated with this disease. Interestingly, outside of the United States isolation of cultures of *E. coli* O157: H7 is associated with sheep. Although swine and poultry carry many strains of *E. coli,* the specific Strain O157:H7 has not been isolated from these farm species. Three *E. coli* outbreaks (one in Montana in 1995, one in Illinois in 1996, and one in Connecticut in 1996) were traced to organic lettuce growers. It is suspected that the lettuce was contaminated by infected cow manure (Nelson, 1997).

Campylobacteriosis *(Campylobacter jejuni)*: This organism is the leading cause of bacterial diarrhea in the United States, the most common source being chickens, or more correctly, fecal contamination of poultry meat. This organism is also commonly transmitted by cattle, birds, and even flies. While the digestive tract of chickens contains many species of *Campylobacter,* it appears that most human infections are caused by four thermophilic strains of this organism. *C. jejuni* causes a watery diarrhea that is only occasionally bloody. Other symptoms include fever, abdominal pain, nausea, headache, and muscle pain. The illness usually lasts two to five days, but reinfection is common and treatment with antibiotics (preferably erythromycin) is not usually necessary. Surveys show that 20-100% of retail chickens are contaminated. When human outbreaks occur they are usually small (less than 50 individuals) although one large outbreak (2,000 people) occurred in Bennington, VT in 1978. Guillain-Barre syndrome may occur as a sequel to this infection as well as meningitis, recurrent colitis, and acute cholecystitis, but these occurrences are rare. Although chickens are the primary animal species associated with this organism, transmission from infected milk is relatively common.

Yersiniosis (*Yersinia enterocolitica*): This organism is a gram-negative rod that is often isolated from wounds, feces, sputum, and mesenteric lymph nodes. CDC estimates that 17,000 cases occur annually in the U.S. It is one of the three most significant microbes than can originate from large swine operations. Yersiniosis is frequently characterized by diarrhea and/or vomiting, fever, and abdominal pain. Similar to Salmonellosis, postenteritis arthritic conditions occur in 2-3% of the affected individuals.

Listeriosis: The CDC estimates that approximately 1600 cases of listeriosis occur each year with 500 resulting in death. It is believed that cattle that are being fed silage are much more likely to harbor this organism. Two separate clinical disease patterns may follow infection with *Listeria monocytogenes*. The more mild form is commonly referred to as gastrointestinal listeriosis and is characterized by a rapid onset of diarrhea, abdominal cramps, and nausea. The more serious form of the disease is referred to as listeriosis. Symptoms include septicemia, meningitis, encephalitis, and intrauterine or cervical infections in pregnant women resulting in spontaneous abortion (2nd or 3rd trimester), or a stillbirth. Gastrointestinal symptoms have been epidemiologically associated with use of antacids which significantly lower the infective dose.

Cryptosporidiosis: Many large-scale waterborne outbreaks have occurred in the United States. Particular attention is focused on the outbreaks in Milwaukee, WI and Carrollton, GA in which 400,000 and 17,000 persons, respectively, were infected. In another incident in Maine, a few hundred children were sickened by *Cryptosporidium*. The source was fresh-pressed apple cider made from apples gathered from a cow pasture (Millard et al., 1994). Conventional drinking water disinfectants such as chlorine and chlorine dioxide are not effective in killing *C. parvum.* The standard water treatment processes of coagulation, flocculation, and filtration are thought to be effective in removing this parasite when operating normally.

Giardiasis: Giardia lamblia: See Above

4.2.3 Effects of Pathogen Pollution

There is ample evidence that pathogens from agricultural operations have caused human disease outbreaks in the past. Ecological damage has also been indicated. Spread from animal to animal at the CAFO is a concern that individual operators have responded to with thorough periodic cleaning usually after one group of animals is sent to market and before another arrives.

Although more is known about the human diseases that may be caused by pathogens released from CAFOs, this section will also discuss the ecological effects of pathogens released into the environment.

An expert panel recently meeting on "Emerging Microbiological Food Safety Issues: Implications for Control in the 21st Century" concluded that control of manure has become a critical issue. Properly treated manure may be an effective and safe fertilizer, but untreated or improperly treated manure may contain pathogens that may reach fresh produce in the field or nearby water supplies.

The following text, tables, and references provide supporting evidence that farm animals held in CAFOS serve as an important reservoir for significant human pathogens and there are documented cases where serious disease outbreaks have occurred as a result of these animals' manure containing pathogens. Table 4.2 shows examples of manure-related human epidemics. A brief summary of each incident follows. These outbreaks involved *E. coli* O157:H7, *Campylobacter*, and *Cryptosporidium parvum*. All cases summarized below resulted in serious illness and even some deaths.

Table 4.2 Examples of Manure-Related Human Epidemics

LOCATION	YEAR	PATHOGEN	IMPACT	SUSPECTED SOURCE	REFERENCE
Walkerton, Canada	2000	*E. coli* O157:H7 & *Campylobacter* spp.	6 deaths, 2300 cases	Runoff from farm fields entering town's water supply	Valcour, J. E., et.al. *Emerg Inf Dis*., March 2002
Washington Co, NY	1999	*E. coli* O157:H7 & *Campylobacter* spp.	2 deaths, 116 cases	runoff at fairgrounds	*Public Health Dispatch*, CDC, 1999
Carrollton, GA	1989	*Cryptosporidium parvum*	13,000 cases	Manure runoff	Solo-Gabriele, *JAWWA*, 88; 76-86
Swindon & Oxfordshire, UK	1989	*Cryptosporidium parvum*	516 excess cases	runoff from farm fields	Richardson, *Epidemiol. Infect* 107:485-495
Bradford, UK	1994	*Cryptosporidium parvum*	125 cases	storm runoff from farm fields	Atherton, *Epidemiol. Infect.* 115:123
Milwaukee, WI	1993	*Cryptosporidium parvum*	400,000 cases, 87 deaths	animal manure and/or human excrement	MacKenzie, *N. Eng. J. Med.* 331:161
Maine & Others	1993	*E. coli* 0157:H7	several illnesses	animal manure spread in apple orchard	Cieslak, *Lancet* 342:367
Sakai City, Japan	1995	*E. coli* 0157:H7	12,680 cases, 425 hospitalized, 3 dead	animal manure used in fields growing alfalfa sprouts	Fukushima, *Pediatrics International* 41:213
Cabool, MO	1990	*E. coli* 0157:H7	243 cases, 4 deaths	water line breaks in farm community	Geldreich, *Water Res.* 26:1127

4.2.4 Human Diseases: Examples of Manure-Related Human Epidemics, Case Studies of Problems and Potential for Problems with Pathogens in Animal Manure

4.2.4.1 Walkerton, Ontario

In May 2000, at Walkerton, Ontario, Canada, 2300 people were infected with *E. coli* O157:H7, and a smaller number were co-infected with *Campylobacter jejuni*. There were seven deaths, and more than 100 people were hospitalized. A direct link was made to cow manure as the source of the pathogens since a pasture occupied by cattle was located near the ground water source for the city's water supply.

4.2.4.2 Washington County Fair, New York

An outbreak of *Escherichia coli* O157:H7 and *Campylobacter* spp. also occurred among attendees of the Washington County Fair, New York in 1999. In this outbreak 116 cases were confirmed, 65 people were admitted to the hospital, 11 children developed HUS (Hemolytic Uremic Syndrome) and 2 children died. The link to cattle manure as the source was primarily through the isolation of these organisms from a shallow well on the fairgrounds and the knowledge that this organism is frequently found in cattle feces.

4.2.4.3 Carrolton, GA

In 1987 an estimated 13,000 people became infected with *Cryptosporidium parvum* due to a malfunction of the drinking water treatment plant. In addition to problems with the coagulation flocculation system, the filtration system was shut down periodically without backwashing the filters prior to each re-start. This failure of process control allowed *C. parvum* oocysts to freely pass through the filtration process. Carrolton, Ga. was the initial large-scale outbreak of crytosporidiosis in the United States.

4.2.4.4 Wilshire, Swindon, and Oxfordshire, England

An outbreak occurrd in Wilshire, Swindon, and Oxfordshire in January 1989, in which 516 cases were recognized, and 8% of the cases required hospitalization. The cause was traced to drinking water, and much emphasis was placed on the fact that the Thames River in this region drained cattle grazing areas. Extensive examination of the water treatment process was carried out, and a boil water order was issued. The outbreak(s) followed periods of heavy rainfall, and this factor supported the hypothesis that cattle manure was a source of the oocysts.

4.2.4.5 Bradford, England

In the community of Bradford, England, a city of 50,000 residents, 125 cases of cryptosporidiosis occurred over a 7-day period. All cases were confirmed by laboratory examination for oocysts. The average oocyst concentration in the city water supply was 0.019/L, and the outbreak occurred following a storm event in which excess water was draining from agricultural fields.

4.2.4.6 Milwaukee, Wisconsin

The largest waterborne outbreak of disease occurred March-April 1993 and resulted from a breach in treatment in one Milwaukee, Wisconsin water treatment plant. This event was responsible for 400,000 cases of illness and 87 deaths, with the deaths occurring among the immuno-compromised segment of the population. Both animal manure and material from a community wastewater treatment plant were implicated as likely causes of this epidemic.

4.2.4.7 Maine

There is evidence that a 1993 *E. coli* outbreak in Maine was the result of manure applications to a vegetable garden.

4.2.4.8 Sakai City, Japan

A massive outbreak of enterohemorrhagic *E. coli* O157:H7 infection occurred in July 1996 in Sakai City, Japan. The outbreak affected 12,680 school children and was caused by *E. coli* O157:H7. The pathogen was present in radish sprouts that the children consumed in a school lunch program. This is the largest outbreak due to this organism. From the original 12,680 children, 425 were treated at a local hospital, 121 developed the hemolytic-uremic syndrome. Three children died. This outbreak may be linked indirectly to cattle manure since the fields where the alfalfa sprouts were grown had been fertilized with manure.

4.2.4.9 Cabool, Missouri

In December 1989 and January 1990 contamination of the city water supply in Cabool, Missouri resulted in 243 cases of *Salmonella typhi* infection and resulted in 4 deaths. Cabool, MO is located in an

agricultural area of Missouri with large populations of beef and dairy cattle in the region. The source of drinking water is ground water, and prior to the outbreak, chlorination was not part of the water treatment process. Additional manure related infectious disease outbreaks have been reported by [Morgan et al. (1998), Solomon et al. (2002)], and Gordeiko et al. (1990). Rather interestingly, two Q-Fever outbreaks related to manure were reported: one in Germany [Reintjes et al. (2000)] and one in England [Jorm et al. (1990)].

While the above summaries concern outbreaks of disease serious enough to involve the public health authorities, other diseases, though less serious, are more common. It was estimated in 1998 that 2-4 million persons were infected with some form of salmonella (USDA, 1994). Salmonellosis is characterized by flu-like symptoms, possibly accompanied by nausea, vomiting, abdominal cramps and diarrhea. Except for *Salmonella typhi,* which is exclusively a human disease, other forms of salmonellosis do not have high mortality rates but do have high morbidity rates and are highly transmittable. Major foodborne outbreaks have been related to consumption of beef, poultry, homemade ice cream, and pork (USDA, 1994). It may also be present in eggs. The incidence of salmonellosis appears to be rising both within the U. S. and in other industrialized nations. *S. enteriditis* isolations from humans have shown a dramatic rise in the past decade, particularly in the northeast United States (6-fold or more).

4.2.5 Animal Diseases

While the common pathogens may be a risk to humans, they are also a risk to other animals. Wild animals moving near manure application sites may carry diseases to new areas. Most ruminants, deer, elk, and others will probably be sensitive to the same organisms that affect cattle. Poultry diseases may also affect other birds. Geese and ducks are known to carry *Cryptosporidium* and *Giardia*.

Distribution of manure beyond the production facility bears the possibility of serious environmental and economic consequences, such as, for example, if there is an asymptomatic carrier of a disease. The manure from that farm could spread the disease to several other farms receiving manure as fertilizer. The consequences could range from increased veterinary bills to treat affected animals to wholesale destruction of infected animals, depending on the disease being spread. Biosecurity of farms has become an important issue with the USDA publishing several guidelines for farms to help secure production facilities from external contamination. Not all pathogens are present at every CAFO. Understanding the distribution of pathogenic organisms makes it easier to design control strategies that will reduce risk. Table 4.3 shows the sources of common zoonotic diseases on farms as a function of livestock species (Cole, 1999).

Reservoirs for *Yersinia enterocolitica* include most domestic mammals, particularly swine. Reservoirs for *Yersinia pseudotuberculosis* include a wide variety of domestic mammals and fowl. The recently discovered hemorrhagic colitis strains of *Escherichia coli* belonging to the O157:H7 serotype are usually acquired after ingestion of either rare ground beef or raw milk. They have also been shown to be transmitted via water. These verotoxin-producing (shigatoxin) strains have been isolated from calves and pigs with enteric diseases and from retail pork and lamb. Reservoirs of *Campylobacter jejuni* include cattle, sheep, swine, dogs, and domestic poultry (USEPA, 1998). Both *E. coli* O157:H7 and *Salmonella* spp. are carried by ruminants, especially cattle, and at least one to five percent of cattle shed *E. coli* O157:H7 in feces. (Altekruse et al., 1997; Hosek et al., 1997).

Table 4.3 Sources of common zoonotic diseases on farms.

	Poultry			Swine	Cattle	
Pathogen	Broilers	Turkeys	Layers		Dairy	Beef
Listeria Monocytogenes					▲	▲
Crytosporidium parvum					▲	▲
Giardia lamblia					▲	▲
Salmonella sp.	▲	▲	▲	▲	▲	▲
Pathogenic *E. coli*					▲	▲
Yersinia enterocolitica				▲		
Leptospira sp.				▲	▲	▲
Campylobacter sp.	▲	▲	▲	▲	▲	▲
Brucella sp.				▲	▲	▲
Erysipelothrix rhusiopathiae		▲		▲		

The gram positive bacterium *Listeria monocytogenes* is widely distributed in the environment and is associated with decaying vegetation, soil, sewage, and feces of animals. Many cases of human listeriosis have been associated with consumption of fresh vegetables possibly contaminated with manure from ruminant animals. *L. monocytogenes* may grow on a variety of vegetables even at refrigeration temperatures. (Brackett, 1999) Therefore, the potential for introduction and transmission of *L. monocytogenes* from manure and soil amended with raw or poorly treated manure on produce may be greater than vegetables grown in soil amended with treated manure.

4.3 Antibiotics

Antibiotics are used extensively in animal production. Approximately 2.5 million kilograms of antibiotics per year are used on livestock in the United States (Kolpin et al., 2000). Of this amount, about 10% is used to treat active infections while the remaining nearly 90% is used for growth promotion and prophylactic care.

Antibiotics may be beneficial in agriculture, but there are growing concerns about the effects of antibiotics in the environment, especially the possibility of the increase in populations of drug-resistant microbes. An increase in drug resistant microbes could make it more difficult to treat diseases in animals and humans. Almost 50% of the antimicrobial agents in North America are used by agriculture. The majority of agricultural use is for growth promotion in farm animals. Growth promotion uses low doses of antibiotics that may lead to more bacterial resistance than higher doses used therapeutically (McGreer, 1998).

Antibiotic residue may be found in animal by-products (manure and urine). This waste may come in contact with humans, other animals, and surface and sub-surface waters through run-off and leaching. The concentrated use of antibiotics at CAFOs makes it more likely to have antibiotic residue and antibiotic resistant microbes in the vicinity.

Wide use of antibiotics may lead to development of resistance among the microorganisms that the antibiotics are being used to control. Antibiotic resistance develops in microbial populations due to the selective pressure exerted on the population by the antibiotic. If the level of antibiotic used is inadequate to completely eliminate the microorganisms from the animals some members of the population will survive. These organisms will continue to increase their resistance to the antibiotic until the antibiotics are no longer effective in controlling populations or diseases. The enzymatic capacity for resistance to antibiotics may be transferred in the environment by different mechanisms. Plasmids may be transferred directly from microorganism to microorganism, by bacteriophages, or upon cell lysis, leading to the uptake of free plasmids by other organisms. Increasing microbial resistance to antibiotics raises the possibility of hard-to-control animal sickness and require use of multiple antibiotics for treatment. Microbes could then become resistant to multiple antibiotics. Since the antibiotics may also be spread throughout the environment via manure and urine, other microbes that come into contact may also become resistant. This includes not only microbes that lead to animal diseases but to human maladies as well. Since the antibiotics used for animals are often the same for humans, different antibiotics may have to be used to fight the resistant microbes. One possibility to prevent this particular problem would be to limit the use of "human" antibiotics on animals.

4.3.1 Case studies on the effect of antibiotics related to CAFOs on the environment:

4.3.1.1 Case 1 – Chesapeake Bay

In the Chesapeake Bay area, manure from a chicken CAFO was used to fertilize fields. The runoff from these fields fed into the Pocomoke River changing the ecology of the river. Recently an outbreak of *Pfiesteria piscicida*, which is toxic to fish and human health, was attributed to the influx of antibiotics from the field runoff. A study has shown that this strain of *Pfiesteria piscicida* found in the Pocomoke River is antibiotic resistant whereas other strains from similar rivers do not show the same antibiotic resistances (Isbister et al., 2000).

4.3.1.2 Case 2 – Iowa Swine Operations

A study conducted by the Iowa Department of Public Health on the effects of CAFOs on the environment showed the presence of antibiotics and antibiotic-resistant microbes in the earthen manure lagoons. The tests revealed an antibiotic in an earthen manure lagoon monitoring well. Four different antibiotics (tetracyclines, sulfonamides, β-lactams, and macrolides) were found in detectable concentrations (Table 4.4).

Table 4.4. Antibiotic Levels in the Lagoons and one Monitoring Well (adapted from Table 7) (Iowa Dept. Public Health, 1998)

Collection Sites (Farm)	Tetracycline (μg/L)	Sulfonamide (μg/L)	β-Lactam (μg/L)	Macrolide (μg/L)
Lagoon (1)	250	>20	<2	227
Lagoon (2)	11	>20	<2	<10
Lagoon (3)	150	>20	<2	60
Lagoon (4)	68	>20	3.5	<10
Lagoon (5)	66	>20	2.1	81
Lagoon (7)	540	>20	2.1	275
Lagoon (8)	110	>20	2.9	15
Monitoring Well (8)	<1	7.6	<2	<10

E. coli, *Enteroccus*, and, *Salmonella* were obtained from the lagoons, wells, and drainage ditches on the sites. All these microbes showed varying antibiotic resistance (Iowa Dept. Public Health, 1998).

4.3.1.3 Case 3 – Shoal Creek

Researchers studying bacteria in Shoal Creek, located in Barry County, Missouri, found detectable concentrations of antibiotics in the creek. This northwest section of the county produces 33 million broiler chickens and 300,000 turkeys annually. The antibiotic source was found to be a chicken CAFO located upstream from where the antibiotics were found. Antibiotics used to treat both animals and humans as well as human only (located downstream of sewage plant effluents) were also found. Further study on the impact of the antibiotics to the watershed and ecological structure of Shoal Creek is on-going (Penprase, 2001).

4.3.1.4 Case 4 – A National Reconnaissance

The U.S. Geological Survey tested water samples from 139 streams in 30 states in 1999 and 2000. The selection of sampling sites was biased toward streams susceptible to contamination (i.e., downstream of intense urbanization and livestock production). The samples were tested for pharmaceuticals, hormones, and other organic wastewater contaminants. Of the 95 organic wastewater contaminants tested, approximately 20 antibiotics were measured and only eight were not found in the samples (however, some of them may have been present in the stream sediment due to "their apparent affinity for sorption to sediment."

Figure 4.3 shows the frequency of detection and percent of total measured concentration for the contaminants, by category (Kolpin, et al. 2002).

The widespread use of antibiotics in agriculture, especially CAFOs, is now becoming an area of investigation in the United States.

4.4 Endocrine Disrupting Chemicals Associated with Concentrated Animal Feeding Operations

Endocrine disruptors are a class of chemicals of growing interest to the environmental community. The U.S. Environmental Protection Agency's (EPA) Risk Assessment Forum defined an endocrine disrupting chemical (EDC) as "an exogenous agent that interferes with the synthesis, secretion, transport, binding, action, or elimination of natural hormones in the body that are responsible for the maintenance of homeostasis, reproduction, development and/or behavior (EPA 1997) ". Most of us are more familiar with chemicals of concern that have a specific health outcome such as lung cancer. However, EDCs are a class of chemicals defined by their mode of action and may result in a variety of health outcomes. For example, an EDC may initiate a health-related outcome in humans or wildlife by binding to and stimulating estrogen or androgen receptors.

Steroid hormones are chemicals of concern to endocrine health associated with CAFOs. Steroid hormones are used by many animals to facilitate the control of their body systems. Mammals, birds, reptiles, and fish produce virtually the same steroid hormones and possess receptors that bind the steroids to receive their control messages (McLachlan 2001). In this section, the term hormones will refer to steroid hormones. Until risk assessments are completed, it is assumed that all endocrine active compounds that have the potential to interact with the environment are chemicals of concern. Thus, the chemicals of concern are those hormones naturally produced and excreted by animals and those hormones administered to animals as drugs and are excreted. These animals remove hormones from their bodies by excreting them

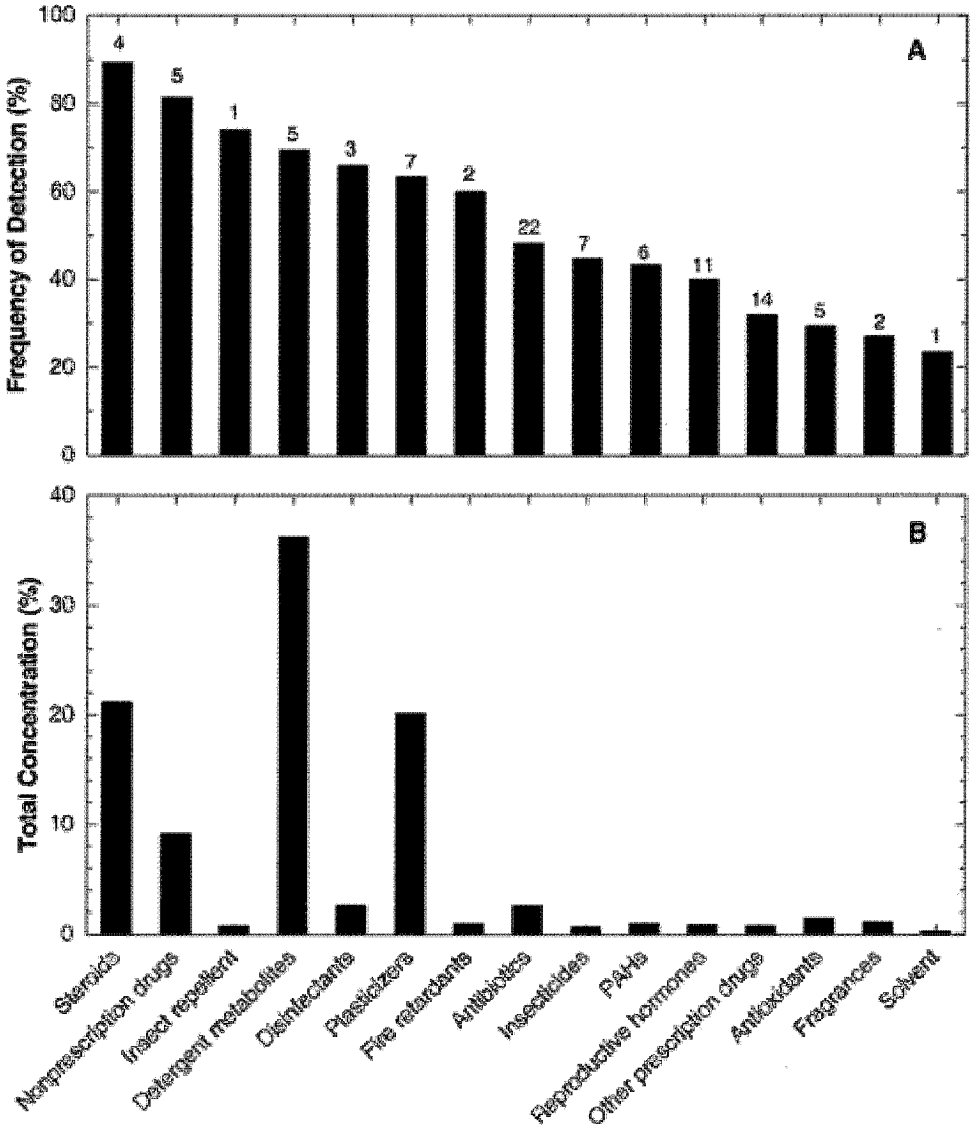

Figure 4.3. Frequency of detection of organic wastewater contaminants by general use category (4A), and percent of total measured concentration of organic wastewater contaminants by general use category (4B). Number of compounds in each category shown above bar (Kolpin, et al., 2002).

in urine or feces. Many of the methods of storage, treatment, and disposal of animal wastes at CAFOs allow contact of the waste with the environment. Since many animal species respond to the same hormones, it may be possible to disrupt the natural state of the endocrine systems in wildlife exposed to waste from CAFOs. If CAFO-generated hormones are transported to water bodies (surface or ground water), exposure to humans may be possible.

The classes of natural (biogenic) hormones that may be excreted by animals include estrogens, androgen, progesterones, and thyroid hormones. Although ideally all hormones would be considered in this risk management evaluation, there is almost no information available about natural hormones and animal feeding operations other than estrogens and, to a lesser extent, androgens. There is no information available

on CAFOS and thyroid hormones. Thus, the focus of this section will be on natural estrogens and veterinary hormones.

The chemical structures of the primary natural estrogens are shown in Figure 4.4. Here, they are shown in their biologically-active forms. Generally, hormones the body wishes to excrete are conjugated with glucoronides or sulfonides. Conjugation eliminates their biological activity and increases their solubility in water. Most literature concludes that excreted, conjugated hormones are deconjugated relatively quickly in the environment by enzymes produced by common bacteria (Schiffer, Daxenberger et al. 2001). It will be assumed that hormones in contact with the environment are not conjugated. The most active estrogen is 17β estradiol, while estrone and estriol are metabolites of estradiol with much less biological activity.

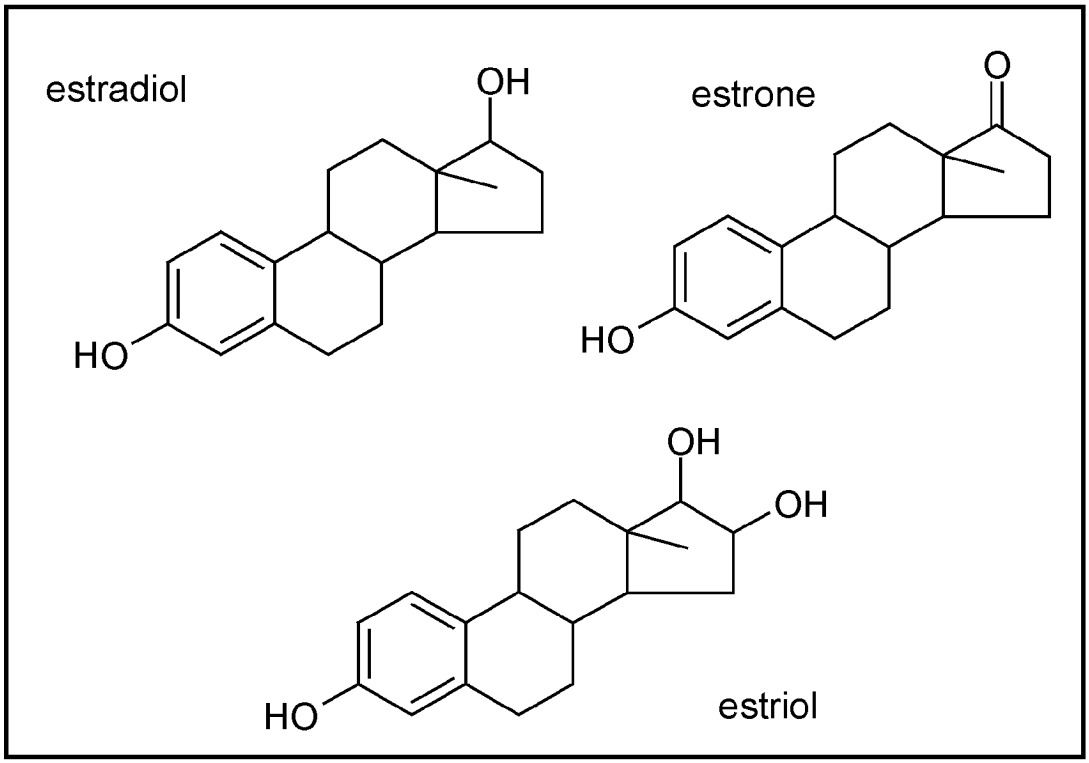

Figure 4.4. Structure of biogenic hormones.

4.4.1 Xenobiotic Hormones

The U.S. Food and Drug Administration (FDA) has approved the veterinary use of the six hormones (Table 1) and only for cattle and sheep (21 CFR, Chapter 1, Part 522). Patented forms of the natural hormones are often used in cattle and sheep production. These include estradiol benzoate (17β-estradiol 3-benzoate) and estradiol valerate (17β-estradiol 17-pentanoate), testosterone propionate, and various derivatives of progesterone, generically called progestins. Xenobiotic hormones administered to cattle and sheep include trenbolone acetate (TbA), melengestrol acetate (MGA), and zeranol. Zeranol is an estrogen mimic. TbA is hydrolyzed *in vivo* to the biologically active chemical, trenbolone-17β (TbOH-17β) (Schiffer, Daxenberger et al. 2001). TbOH-17β acts as an androgen, and an antiglucocorticoid. TbOH -17β

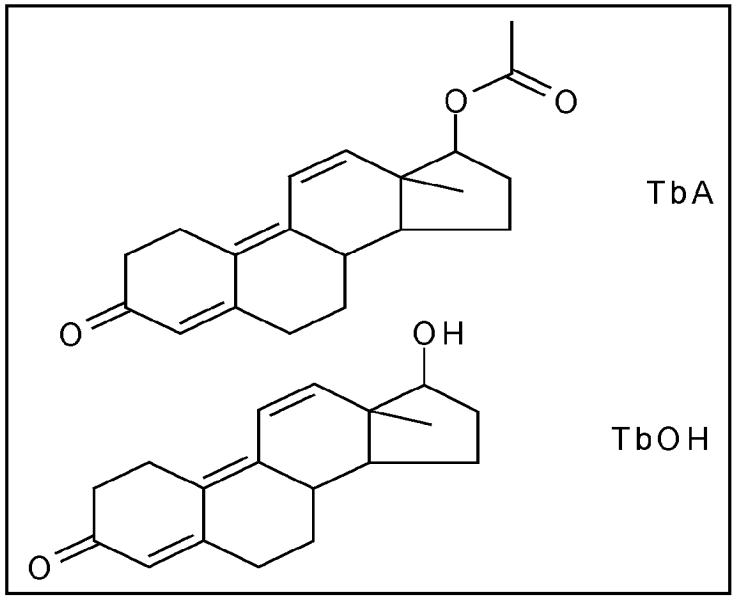

Figure 4.5. Chemical structure of Trenbolone acetate and hydroxide.

may be metabolized to TbOH-17αϵ which is 40 times less active than TbOH- 17β. Zeranol is an estrogen mimic. The chemical structures of these compounds are shown in Figure 4.5.

MGA is used for estrus synchronization or induction to improve feed efficiency and weight gain in heifers (Schiffer, Daxenberger et al. 2001). MGA acts as a progesterone and glucocorticoid.

The parent veterinary drug, trenbelone acetate (TbA), is metabolized to the biologically active chemical, trenbelone-17β (TbOH-17β) and TbOH-17α. The β and α are isomers where the methyl and hydroxyl groups are *cis* and *trans*, respectively.

Since steroid hormones are the signal molecules of the endocrine system, organisms exposed to these hormones have the potential for adverse endocrine related effects. The consequences of excess estrogen in humans may be dramatic (Williams Textbook, 1998) and effects at low doses are possible (Anderson, 1999). Unintentional exposure of wildlife to estrogens has focused mostly on fish: vitellogenin production in male fish has been observed when exposed as little as 1 ng/l 17β estradiol or 25 ng/l estrone (Routledge, 1998). Other estrogen-related health effects observed in wildlife include abnormalities in reproductive organ development and sex change. *In vitro* assays that measure binding to human steroid receptors have shown that TbOH -17β binds to the human androgen receptor as strongly as the natural human androgen, dihydrotestosterone, and MGA binds 3.5-times stronger to the human progesterone receptor than progesterone itself (Bauer, Daxenberger et al. 2000).

4.4.2 Uses of Hormones in CAFOs

Farm animals generate, use, metabolize, and excrete natural hormones, the type and quantity depending on the animal, sex, and reproductive state.

The FDA has approved the veterinary use for cattle of the hormones listed in Table 4.5 in single hormone or dual hormone doses (21 CFR, Chapter 1, Part 522). The delivery of the hormones is typically

Table 4.5. Hormones Approved for Veterinary Use in Cattle

Hormone	Biological Activity	Commercial Forms
17β-estradiol	estrogenic	estradiol benzoate, estrodiol valerate
testosterone	androgenic	testosterone propionate
progesterone	progesteronic	progestin
trenbelone acetate	androgenic	same
melengestrol acetate	progesteronic	same
zeranol	estrogenic	same

accomplished by ear implant (although delivery of MGA in feed is approved by the FDA). The FDA has approved several dual hormone implants, including an implant containing 20 mg TbA and an implant containing 20 mg estradiol benzoate with 200 mg testosterone propionate. Data on the rate of use of these hormones in the United States were not found.

Arcand-Hoy *et al.*(Arcand-Hoy, Nimrod et al. 1998) estimated the use of exogenous estradiol (presumably the sum of the use of simple estradiol and the benzoate and valerate forms) to farm animals to be 580 kg/yr in the United States.

4.4.3 Release of Hormones to the Environment

Since hormones are present in animal excreted waste and in their bodies, excreted waste (urine and feces) and animal carcasses that come into contact with the environment must be considered as likely sources of hormones to the environment. Although the hormone content of waste has not been systematically studied, a relatively large total mass of hormones is released yearly given the estimated 291 billion pounds of manure generated annually in the United States (EPA 2001). The avenues of release of animal waste into the environment at CAFOs are described in detail in other sections of this RME. These releases may be associated with leakage from storage lagoons, runoff from composting operations, land application of waste, and other scenarios. There are very little data to quantify the release rates of hormones to the environment from CAFOs. One study found that chicken litter may contain > 100µg/kg estrogen and that runoff from a field receiving poultry waste contained up to 3.5 µg/l estradiol (Shore, Cornell et al. 1995). A similar study found 1.3 µg/l estradiol in runoff from land applied with poultry waste (litter) (Nichols, Daniel et al. 1997). Testosterone was found in rooster litter up to 670 µg/kg (Shore, Harel-Markowitz et al. 1993). In another study, MGA and metabolites of TbA were measured in the dung of cattle given implants of MGA or TbA (Schiffer, Daxenberger et al. 2001). The maximum levels found in the dung were 7.8, 75, 4.3 µg/kg of MGA, TbOH-17α, and TbOH -17β, respectively. Although there is little data, the U.S. EPA acknowledges that hormones should be considered in assessing the environmental impact of CAFOs (EPA 2001).

A recent news article quoted as yet unpublished work by U.S. EPA and university researchers regarding a study of the hormonal character of a stream associated with a cattle feedlot in Nebraska (Raloff, 2002). The research found that water collected downstream of the feedlot had significantly higher androgenic activity than water collected upstream.

4.5 Metals

4.5.1 Use of Metals in Animal Feed

Animals in CAFOS produce a great amount of manure that is applied to land as fertilizer. The metal content of animal waste is in question. Metals are being supplied to farm animals via diet. This review of the literature investigates the disbursement of the nutrient-rich excreta and the effects that are or may be encountered.

Metals in discussion here are copper, zinc and arsenic. While trace amounts of some elements are necessary for life, quantities above and beyond those amounts are fed to swine and poultry as growth promoters. Usually arsenic (often in the form of "roxarsone", Christen, 2001) is fed to chickens for this purpose, even though arsenic is not a required nutrient; exaggerated amounts of copper and zinc (often in the form of $CuSO_4$ and ZnO or $ZnSO_4$, respectively) are typically used in the swine diets. Possible adverse effects reported in the literature include the risk of phytotoxicity, groundwater contamination, and deposition in river sediment that may eventually release to pollute the water, the effect of manure application on grazing animals and also the result of using chicken litter for livestock feed.

The use of excess metals to promote growth is practiced in many countries. For example, Canada (DeLange, 1997), Great Britain (Nicholson, 1999), Japan (Eneji, 2001), France (Martinez, 2000), Germany (Rothe, 1994), Spain (Alonzo, 2000), Denmark (Tom-Petersen, 2001) and others have engaged in research to address issues similar to those of concern in the United States. Though the study parameters and methods of research may differ, overall, there are questions and conclusions that are nevertheless relevant to the demands of this discussion and are therefore taken into consideration.

The following table (Table 4.6) presents dietary/manure content data to give the reader an idea of the amounts of copper and zinc consumed by pigs when fed diets that achieve normal growth and those that promote growth. Arsenic is not a dietary requirement for poultry, the growth promoting level 5-10 ppm yields manure with 15-45 ppm (Muller, 2002; Chaney, 2002; Alonso, 2000; Ohio State Univ Bulletin, 1998).

Table 4.6 Copper and zinc in swine diets

Swine Diets (ppm)	Required Cu	High Cu	Required Zn	High Zn
Weanling/piglet	6	125-250	80-100	2000-3000
Manure (ppm)	~5.4	~113-225	~72-90	~1800-2700

4.5.2 Mobility of metals in soil

Mobility of the excreted metals has been addressed by some sources. Martinez (2000) examined the copper and zinc balances in soil after five years of repeated pig slurry applications. The results showed that most of the nutrient copper and zinc (80% of what was applied) remains in the top 0-20 cm of the soil layer. Tables 4.7 and 4.8 show soil analysis data for copper and zinc.

Table 4.7 Soil Cu balance after five years of repeated pig slurry application.

Soil Layer	Soil Cu content, mg/kg		EDTA Cu kg/ha		Increase in soil Cu	Recovery of Cu from slurry applied
	1991	1996	1991	1996		
0-20	2.8±0.3	35.1±2.8	7.3	91.3	84	45.8
20-40	2.2±0.5	12.6±2.6	5.6	32.8	27.2	14.8
40-60	1.3±0.3	2.2±0.7	3.3	5.6	2.3	1.3
Total	----------	----------	16.2	129.7	113.5	61.9

Table 4.8 Soil Zn balance after five years of repeated pig slurry application.

Soil Layer	Soil Zn content, mg/kg		EDTA Zn kg/ha		Increase in soil Zn	Recovery of Zn from slurry applied
	1991	1996	1991	1996		
0-20	2.7±0.8	64.1±5.8	6.9	167.0	160.1	60.2
20-40	2.3±0.7	15.4±2.4	5.9	40.0	34.1	12.8
40-60	0.8±0.3	1.8±0.5	2.1	4.6	2.5	0.9
Total	----------	----------	14.9	211.6	196.7	73.9

Gettier et al., (1988) is in agreement by finding that copper, when applied to the soil surface via pig manure, shows little movement through the soil profile (i.e., 0 – 20 cm) used in that experiment. (Also, see Table 4, data from World Animal Science, 1987.) It was reported that copper applied to soil generally results in a linear increase in extractable copper. Similarly, Mohanna et al., (1999) found a linear relationship between dietary zinc supplementation and the amount excreted. It has been advised that, with pig slurry application, immediate effects may not be recognized. Because metals may accumulate in the topsoil, it may be the longer term applications that reveal adverse effects (i.e., changes in soil biomass and herbage metal concentration) (Christie et al., 1989 and Eneji et al., 2001).

During an eight year period, Martinez et al. (2000), assessed the copper and zinc content of soil and drainage water in soil subjected to intensive pig slurry application. About 62% of the applied copper and 74% of the applied zinc remained in the soil as EDTA extractable forms. Only 0.05% and 0.6%, respectively, were present in the drainage water. A study of 18 soils in the Netherlands reported information concerning the correlation of organic matter and desorption of several metals (Impellitteri, et al., 2002). The results indicated that increasing pH increased soluble organic matter and Cu. Increased Ca flocculated organic matter and restrained Cu in solution. McBride (1994) stated that Cu added to soil will remain there for very long times. High organic matter increases mobility, but Cu is least soluble at pH near seven. Zinc may leach to lower levels of the soil if there are significant inputs of Ca to displace it from the exchange sites. Arsenic behaves in soil much like phosphate. That is, As only moves lower in the soil profile if the sorption capacity of the upper layers is filled. Based on this information, the amount of metals in the drainage may be very small, but some of the excreted metals do get carried into the groundwater, eventually making their way to a stream or river bed. Here, strewn about the sediment, the metals may be set into motion again as environmental conditions change (e.g., pH, redox potential, or high stream flow) (Lim et al., 1995). At that point, environmental consequences may become severe, even if they are delayed in time from the point of initial contamination. As, Cu, and Zn all have potential toxicity to plants and animals. Arsenic is found in soils from about 3.6 to 8.8 mg/kg. Copper is found in soils from about 14 to 29 mg/kg. And zinc is found in soils from about 34 to 84 mg/kg. Copper and zinc are both essential

elements for plant and animal life. The needed levels and the toxic levels will change as environmental conditions change. Arsenic is not an essential element and is more toxic to plants and animals than Cu or Zn.

4.5.3 Metals in plants

Christie et al. (1989), conducted a sixteen year study addressing herbage concentrations of copper and zinc that had reached 10 and 44 mg/kg, respectively. The purpose was to determine the toxicity to grazing sheep. See Table 4.9 for content data. While a very high rate of application (200 m^3/ha/yr) was used to test extreme conditions, this rate produced enough soil copper and zinc accumulation sufficient to produce a toxic response from sheep (>10 mg/kg). Sheep are especially susceptible to excess copper, and a prolonged ingestion of just 15 - 20 ppm of copper may result in the occurrence of fatal hemolytic crisis. (World Animal Science, 1987)

Table 4.9 Cu and Zn in soil (top 5 cm), February, 1987 and herbage first cut of 1986.

		Copper				Zinc			
Treatment	pH	EDTA extract	Total	Extractable/total	Herbage	EDTA extract	Total	Extractable/total	Herbage
Fertilizer	5.1	4.8	14.8	0.32	3.9	4.4	55.9	0.08	13.5
Control	5.4	5.4	15.5	0.35	3.6	4.1	58.0	0.07	14.3
Pig Slurry, m^3/ha/yr									
50	5.6	25.9	40.2	0.65	4.6	15.2	76.6	0.20	21.5
100	5.3	49.6	69.0	0.72	8.2	26.4	93.9	0.29	34.0
200	5.1	85.2	110.8	0.77	10.1	50.8	110.8	0.46	43.7
Cow Slurry, m^3/ha/yr									
50	5.8	6.4	16.3	0.40	3.3	6.6	61.1	0.11	13.2
100	6.0	7.7	19.0	0.41	4.2	9.8	69.4	0.14	14.3
200	6.2	9.6	21.6	0.45	7.2	16.0	76.8	0.21	20.5
L.S.D. at 5% level	0.1	5.7	5.1	0.06	1.0	3.9	8.5	0.04	3.5

All values are mg/kg dry material. L.S.D. least significant difference (minimum difference to have significance).

While some studies proposed a threat of copper and zinc phytotoxicity, there was not an abundance of conclusive data. Tom-Petersen, 2001, explained that if the accumulation of copper in the soil reaches a toxic level, structure and function of the microbial community may be affected. But this source goes on to say that a lack of knowledge on the interaction between copper and the biota makes it difficult to assess the impact on a biological system. Likewise, Gettier, et al., 1988 states that while a high level of copper in soil is phytotoxic, the amount of copper that may may safely be added to a soil system has not been well defined. World Animal Science, 1987, has indicated that zinc is partly added to high copper diets to counteract the accumulation of copper in animal tissue, and accumulation of either of these metals in soil could cause phytotoxicity in which the plant root system is affected first.

4.5.4 Metals in Animals

Alonso, et al., 2000, performed a study to determine whether pig slurry treated fields have an effect on the accumulation of copper and zinc in grazing cattle. It has been suggested that ruminants may be more at risk for copper toxicity because of their efficiency in absorbing trace elements across the gut, which may lead to toxic levels of copper in the liver. When the liver reaches saturation with copper, the copper is released quickly into the blood. In sheep, copper may cause fatal hemolytic crisis. This study concluded that, in areas with the highest pig densities, more than 20% of the cattle examined had hepatic copper levels exceeding the toxic concentration of 150 mg/kg fresh weight. Zinc liver levels, however, did not seem to be of any consequence.

The use of chicken litter (consisting of poultry manure, feathers, bedding, and spilled feed (Poore, et al., 1998) as livestock feed is yet another area of concern. While broiler litter has been used for over fifty years with no major problems, research performed at Virginia Tech. reported increases in arsenic and copper concentrations in the livers of cattle fed poultry litter. The arsenic concentration, however, returns to control levels within three days of withdrawal. Therefore, most states recommend a fifteen-day withdrawal period prior to slaughter. A related study indicated that while increased liver copper concentrations in cattle fed poultry litter without adverse effects have been reported, it was found in this study that the feeding of 1.13 kg $CuSO_4$/90.7 kg chicken litter to cattle resulted in chronic copper toxicosis. However, this condition may be reduced by supplementation of molybdenum and thiosulfate (Banton, et al., 1987). For reference, the level of arsenic in a typical chicken manure/litter is about 25 ppm. (Chaney, et al., 2000) A literature search for additional information regarding the role of arsenic contamination of soil via chicken manure (e.g., phytotoxicity, drainage water, sediment residue, etc.) was not fruitful.

Metals are excreted in various forms by animals. A common form of copper is the divalent ion that may form complexes with organic matter. Similarly, zinc has a divalent form that will also complex with organic matter. Arsenic more closely resembles phosphorus in its behavior.

4.5.5 Summary

The following comments are extracted from this review of dietary copper, zinc, and arsenic consumption by pigs and poultry and the distribution of these metals when excreted.

1. Copper and zinc are fed to swine in concentrations that exceed the minimum requirements to induce a growth promoting effect. In chickens, arsenic is used as a supplement for growth promotion; arsenic is not a dietary requirement in chicken feed.

2. Approximately 80-90% of the copper, zinc, and arsenic consumed is excreted.

3. Most of the excreted metals, contained in manure/slurry for land application, settle in the topsoil, approximately the first 0 - 20 cm of soil.

4. World Animal Science, 1987, reports that pig manure slurry, on the average, contains six times more copper than either poultry or cattle slurry. This presents a more striking danger of copper enrichment in those soils being fertilized with pig excreta.

5. Zinc added to a high copper diet helps thwart the possibility of copper toxicity.

6. In swine, the response to feed additives is greatest in starter diets (10-50 pounds). Higher levels of copper and zinc are typically found in the diet at this level. (KSU, October 1997)

7. A management plan needs to be established for each CAFO, on an individual basis, that takes into account variables such as soil type, soil pH, land area for manure application, level of waste water produced, animal density, anticipated metal output, etc.

8. There is a need to identify other growth promoters that would be non-toxic, or at least identify other forms of the metal compounds being used now that would be more bioavailable. For example, cupric citrate was found to promote growth at lower levels than cupric sulfate pentahydrate, resulting in less litter copper (Pesti, et al., 1996).

5 STRESSOR TRANSPORT

In the large quantities present at CAFOs, animal manure contains enough watershed stressors to be a significant source of environmental pollution. This section describes the ways in which the stressors in manure may be released into the environment. Overland transport in wet weather flow, subsurface transport to and through groundwater, and airborne transport and deposition are the primary pathways by which the environmental stressors in animal manure reach the environment. Understanding these pathways is important in developing strategies for managing the environmental risk posed by animal manure.

This section of the RME describes overland transport in wet weather flow, subsurface transport, air transport, and deposition in that order.

5.1 Transport Mechanisms

5.1.1 Overland Transport in Wet Weather Flow

The impact of wet weather flow and sediments from confined animal feeding operations (CAFOs) could be significant to maintaining a watershed environmental quality. Wet weather flow may provide conditions that result in the transport of contaminants and sediments to a receiving water. Sediment may prove a significant stressor to a watershed as sediment itself or as a medium for the transport of other stressors such as nutrients, pathogens, or chemical stressors. The processes responsible for the generation, transport, and deposition of sediment into a receiving water are primarily erosion, overland flow, and deposition. The effects of these physical and chemical processes will be dependent on the type of CAFO and the operations of facilities and their waste handling strategies. This section outlines some of the principal physical and chemical processes affecting sediment impacts from CAFOs, how these processes impact typical CAFO operations, and to identify areas of research as related to the reduction of sediment impacts on watersheds from CAFOs.

5.1.2 Physical and Chemical Processes Affecting Sediment Impacts

Three primary components of runoff are overland flow or surface runoff, interflow and groundwater flow. Overland flow is the portion of precipitation that flows over the ground surface until reaching a receiving point, such as a channel, stream, or pond. Overland flow occurs typically after the infiltration capacity of the soil has been exceeded. Interflow, also referred to as sub-surface storm flow, is the portion of precipitation that travels just under the soil surface until it reaches a receiving point. Groundwater flow, also referred to as baseflow or dry-weather flow, is the portion of precipitation that infiltrates the soil and percolates deeper until reaching the water table, and later potentially emerging as a component of stream flow downgradient from the infiltration zone.

5.1.3 Overland Flow

When precipitation first reaches the ground surface, it begins to infiltrate the soil. The rate of infiltration, called the infiltration capacity, decreases over time. This decrease is primarily due to the saturation of the soil void volumes. Once the soil becomes saturated, infiltration continues at an approximately constant rate, assuming that the precipitation event continues at an intensity equal to or

greater than the infiltration capacity. In general, the infiltration rate for clayey soils is less than that for sandy soils.

If the intensity and duration of precipitation is great enough to exceed the infiltration capacity of the soil, water will begin flowing over the ground surface as surface runoff. Some of this runoff flows into small puddles and ponds, and is termed depression storage. Runoff retained in depression storage may experience further infiltration or if the capacity of the depression is exceeded, overland flow will continue either until another depression, a stream, or receiving water body is encountered.

The wide variability in soil type, topography and vegetative cover within a watershed, coupled with the inconsistency of precipitation, results in some areas contributing a larger portion of runoff to stream flow and other areas contributing much less or not at all. The partial area contribution concept has been used to describe this behavior and it has been noted that in some watersheds as little as 1-3 % of the total basin contributes overland runoff to stream flow.

5.1.4 Interflow

The portion of infiltrated water that travels under the soil surface toward a receiving water body is interflow or sub-surface storm flow, and the movement of interflow is much slower than overland flow. This component of runoff is typically important in areas with permeable soil overlying less permeable soils or sub-surface materials, such as bedrock or clay, as may be the case of farm fields that are plowed and have a high percentage of organic material incorporated into the soil structure.

In many watersheds, the concept of variable source area contribution is important or dominates runoff closer to stream channels or receiving water bodies with shallow water tables, or where shallow impervious materials underlie the surficial soils. A variable source area in general is an area that expands or contracts depending on the precipitation event and initial soil moisture conditions, and occurs when soils become saturated from below due to a rising water table. As precipitation continues, the soils become saturated by the rising water table which in turn expands the area over which runoff will occur.

5.1.5 Groundwater flow

Groundwater flow, also referred to as baseflow or dry-weather flow may account for a substantial percentage of subsurface runoff from a watershed or to a receiving water body. Precipitation that continues to infiltrate the soil surface after the soil is saturated, and does not become interflow, percolates downward by capillary action and gravity until reaching the water table or an impermeable geologic unit. The area within a watershed, where infiltrating precipitation eventually reaches the water table and becomes groundwater, is termed a recharge area. Groundwater flows from areas of high potential (recharge area) to areas of low potential (discharge area). Recharge areas are typically topographically higher in elevation than discharge areas that are usually incidental with a stream, river, or pond.

5.2 How These Processes Impact Typical CAFO Operations

Runoff, and the various components of runoff have varying degrees of importance in the context of CAFOs. The area of consideration at the individual CAFO is important when determining if runoff may be a concern. Runoff may occur from several areas, including the roof of a barn or other type of shelter used to house animals, external feeding areas that may or may not be paved, and may or may not be diverted to a lagoon or holding pond, pasture lands used for animal grazing, and crop lands that receive animal waste as a nutrient source.

In this discussion, water that is used to flush animal waste generated inside a barn or shelter to a holding facility is not considered part of runoff. If this material is incorporated into the soil surrounding the CAFO, the materials in this water, both physical and chemical, will be susceptible to runoff processes.

Runoff may or may not have any associated impact or concerns. Depending on the flow path and material encountered during the generation of runoff, water has the ability to pick up physical and chemical components that may degrade the receiving waters. These potentially degrading compounds include sediments, nutrients, pathogens, EDCs, heavy metals, and pesticides. These various compounds are discussed in separate sections. Additionally, runoff has the ability to cause flooding.

Many conditions contribute to the generation of runoff including topography, geology, soil type and thickness, precipitation intensity, duration and form (rain versus snow), vegetative cover, climate and season, soil moisture, evapotranspiration, depth to groundwater, presence of vegetative buffers, condition of the land surface (recently plowed and plowing technique) and size of the field, farm or watershed in question.

5.2.1 Suspended Solids and Sediments (SSAS)

SSAS production from CAFOs may be attributed to three primary sources; direct erosion, loss of impoundment/lagoon sediments, and waste handling/disposal processes. Direct erosion may be an obvious source of sediment in certain CAFOs, such as beef cattle feedlots, dairy operations, or other outdoor operations. Erosion from these operations will be subject to erosion processes typical of other agricultural practices. SSAS from impoundments/lagoons may be controlled by the design of the impoundment/lagoon. Waste handling/disposal processes may also generate SSAS. For example, land application is typically used for swine waste. Though the waste will have undergone some preliminary settling during handling and storage, the application of the waste to agricultural fields may result in particles being applied to the field, as well as, the waste adhering to the SSAS generated from the erosion of the agricultural soils.

The natural processes of erosion results in a background sediment load to receiving waters. Erosion is the term used for the gradual wearing away of the earth's surface due to natural physical and chemical processes. Millar et al.,(1965), differentiates between geologic and soil erosion. Geologic erosion is defined as the erosion of the earth's surface under natural conditions when the land surface and the vegetative cover are undisturbed. Geologic erosion is a relatively slow process and natural in-stream processes are typically able to assimilate the sediment loadings that result. Soil erosion is defined as the unnatural erosion of the land surface, typically due to man's activities such as deforestation, tilling, or other activities. The natural processes of erosion may be significantly accelerated by man's activities. Research has been conducted on conditions and practices that affect soil erosion such as soil properties, the impact of typical agricultural practices, deforestation, and burning (Braskerud, 2001; Butler and Karunaratne, 1995; Carpenter et al., 2001; Haigh and Gentcheva-Kostadinova, 2002; Kondolf et al.,In Press; Lau et al., 2001; Lisle et al., 1998; Martin-Vide et al., 1999; Midmore et al., 1996; Millar et al., 1965; Nash and Halliwell, 2000; Peterson 1999; Uri and Lewis, 1998; van der Werf and Petit In Press; and Woo et al., 1997). This research has focused on retaining topsoil and soil structure for maintaining or enhancing agricultural production. The impact of CAFOs with respect to SSAS has not been thoroughly considered.

In this document, erosion will be limited to that caused by water. Erosion by water is typically divided into four categories: splash, sheet, rill, and gully erosion. Splash erosion is the deterioration of the soil structure due to the impact of a raindrop onto the soil surface. The impact breaks down the soil structure and the water from the droplet carries away or erodes some of the soil. Sheet erosion is erosion

typically over a smooth, lightly sloped soil and results from overland flow. This results in a gradual uniform removal of soil particles. However, sheet erosion seldom occurs without forming rill erosion. Rill erosion is the result of pockets of water forming in small depressions. The water leaving these pockets form small rivulets of flow, which erode small channels into the soil. The small channels cut are called rills. Sheet and rill erosion are typically due to overland flow. Left unchecked, the small channels enlarge to form larger channels that eventually combine to form still larger channels. As these channels increase in size their water carrying capacity increases, which consequently results in a greater capacity to erode the soil. Once these channels work down through the soil structure, they form what is known as gully erosion. Gully erosion is the combined process of waterfall erosion, channel erosion, and freeze/thaw erosion. Gully erosion is easily identified and typically indicates severe neglect. This form of erosion may significantly add to the sediment load of a nearby receiving water.

Erosion generates the particles that are carried to the receiving water to become suspended solids and sediment. Once in the receiving water, in-stream processes control whether the SSAS are deposited or carried downstream to be deposited later. These in-stream processes are beyond the scope of this work and for the most part are not necessary to the issue of managing SSAS from CAFOs.

5.2.2 Stress due to SSAS

SSAS may act as a stressor directly on an aquatic system or indirectly by transporting particle bound stressors. As a direct stressor, SSAS may significantly increase the turbidity in receiving water. This increased turbidity may dramatically reduce the primary production of the water column by limiting the light penetration (USEPA, 2001b). Depending on the physical and chemical characteristics of the SSAS, the turbidity may persist downstream even with significant dilution and/or settling time. SSAS may also result in siltation of a receiving water. Siltation may result in a loss of critical habitat, loss of water carrying capacity, and increased need for dredging or other waterway maintenance.

SSAS may also serve as a significant source of particle bound stressors. Contaminants that are particle bound may increase the aquatic exposure in the receiving water by renewed exposure through resuspension and redeposition. These particle-bound contaminants may include nutrients, pathogens, metals, and organic contaminants. Nutrients such as nitrogen, phosphorus, and potassium may be carried by SSAS to a receiving water. CAFO wastes are typically high in these components (USEPA, 2001a) and depending on the chemical form of the nutrient, the SSAS may serve to transport these stressors. Pathogens are also found in CAFO wastes and may be associated with soil particles and sediments. The interactions between pathogens and SSAS are beyond the scope of this report. In addition, organic contaminants (such as EDCs, antibiotics, etc) trace metals, and salts may be associated with SSAS. These stressors are addressed in other sections of this document.

SSAS may also act as a stressor by reducing the available dissolved oxygen in a receiving water. The organic content of CAFO waste is animal specific. In general, beef/dairy waste has a high organic content in the form of undigested cellulose. Swine waste and poultry waste are lower in organic content. The organic content is important as it provides an organic substrate for microbial activity. This microbial activity uses available dissolved oxygen in the water column. If the oxygen demand exceeds the available dissolved oxygen (DO) and the rate of re-aeration, the DO may drop to levels that are critical for maintaining a viable ecosystem. The oxygen demand is commonly measured as either a biochemical oxygen demand (BOD), which is the oxygen demand required to biologically stabilize the biodegradable components, or a chemical oxygen demand (COD), which is the oxygen demand needed to chemically oxidize organic and inorganic components regardless of their biodegradability (Millar et al., 1965). With

all the considerations of efficient management of SSAS and other stressors, economic design constraints must be considered in the optimization of the design. The management strategies may not be so cost prohibitive that the CAFO operator cannot afford the management. In the economic considerations, the design should account for the impact on production, as well. For example, the design cannot be for a ten acre detention basin on a five acre CAFO.

CAFOs offer a challenge to manage their impact on the environment and the economic production of the animal product. However, the concentrated nature of their design offers an opportunity to engineer an efficient and economic management solution and in the end potentially to reduce the overall waste load to the environment from animal production whether confined or traditional.

5.3 Groundwater Transport

5.3.1 Statement of Problem

Storage and handling of animal waste in CAFOs and related agricultural practices are contributing to groundwater contamination, and may have severe impact on surface water quality, since 40 percent of the average stream flow is derived from ground water discharge as base flow (U.S.EPA 1993b in EPA-821-R-01-003). Dairy operations were identified as the major source of groundwater contamination by nitrate in excess of the MCL in the Chino Basin, California (U.S. EPA, 1998, Aton et al., 1988). This presents potentially widespread impacts, since water from the Chino Basin is used to recharge the primary source of drinking water for residents of heavily populated Orange County. In southeastern Delaware and the Eastern shore of Maryland, over 20% of wells were found to have nitrate levels exceeding the MCL (U.S. EPA, 1998, Ritter et. al., 1989). Measured nitrate levels in ground water beneath Delaware poultry houses have been as high as 100 mg/l (Ritter et. al., 1989). Fractured aquifers (e.g., karst terrains developed in carbonate rocks) underlie extensive, important agricultural areas in the eastern half of the United States (from Iowa, to New Mexico and Texas, to Florida and Puerto Rico, and to Pennsylvania and New York) are particularly vulnerable to nitrate by preferential transport (LeGrand and Stringfield, 1973). Evidence indicates that leachate from lagoons located in well-drained soils (e.g., loamy sand) may severely impact groundwater quality (EPA-821-R-01-003, Ritter and Chirnside, 1990), and that the use of manure in agriculture may cause bacterial contamination in karst aquifers (Boyer, 1999). Since rural areas in the nation generally rely on ground water as a drinking water source, they are at greater risk of nitrate poisoning than those drawing from public water supplies (U.S.EPA, 1998, Nolan and Ruddy, 1996). Nutrients, pathogens, salts, toxic metals, antibiotics, and hormones derived or excreted from animal waste and carcasses have the potential for groundwater contamination and thus may cause an environmental problem. Nitrate and pathogens in ground water impact human and animal health, and leaching salts may cause underlying groundwater to be unsuitable for human consumption (U.S.EPA, 1998).

The cited case studies in California, Delaware, and Maryland are examples of nationwide problems of subsurface water and groundwater contamination by confined animal operations and related agriculture, including others in the Midwest. They underscore the importance of managing animal feeding operations to minimize impacts on water quality and public health. The effectiveness of practices to control contaminant losses from animal waste storage facilities and farmlands treated with animal manure depends, among other factors, on the type of contaminants and their likely pathways in the subsurface and ground water. Considerable scientific advances have been achieved in testing, measuring, and modeling the behavior and fate and transport of pollutants in the environment in general, and in the subsurface in particular. However, research is needed to further develop scientifically sound methods for assessing and managing the impact of CAFOs on ground water. With the adoption of the Watershed Protection approach (WPA) as a strategy for

effectively protecting and restoring aquatic ecosystems and protecting human health (USEPA, 1995), risk-based approaches for CAFOs are needed to better integrate environmental and socioeconomic factors in the context of watershed management.

5.3.2 Pollutants, Sources, Transport, and Fate

Animal manure contains nutrients, particularly N and P, dissolved mineral salts, toxic metals, microorganisms, and antibiotics. Among these constituents, however, nitrates, ammonia, and potentially pathogenic organisms are the most common groundwater pollutants. They negatively impact human and ecological health.

Efficacy of risk-based management of animal waste and manure-based agriculture requires understanding the behavior of the pollutants in soil and the processes responsible for their transport through the soil profile to ground water and surface waters. Figure 5.1 depicts potential pathways for movement of a pollutant once introduced into soil. Areas with high soil permeability and shallow water tables are generally most vulnerable to groundwater contamination by pollutants. Percolating water and lagoon leachate may transport pollutants through the soil profile to ground water. Interflow (e.g., subsurface runoff and artificial drainage) and ground water may deliver pollutants to surface waters through hydraulic connections. Not all pollutants are susceptible to transport by leaching, because they are adsorbed onto soil particles, fixed and/or transformed into organic forms by soil microbes. Mobility and persistence of pollutants are controlled by physicochemical characteristics of the pollutant and the soil-aquifer system.

Processes responsible for transport and fate of major CAFO related groundwater pollutants are discussed in the following sections in more detail only for nitrogen compounds, phosphorus, and pathogens.

5.3.2.1 Nitrogen

Animal waste contains nitrogen in organic and inorganic forms, the latter of which is biologically available to microorganisms and plants. Inorganic ammonia exists in two forms in natural waters: ammonium ion (NH_4^+) and un-ionized ammonia (NH_3). The un-ionized form is toxic to fish in low concentrations. Whereas nitrate is water soluble and moves freely through most soils, ammonia compounds are much less mobile and thus, much less susceptible to leaching in soils. Figure 5.2 depicts processes primarily responsible for transformation of nitrogen compounds in sediments at the bottom of lagoons (collection ponds) or in a topsoil layer treated with animal manure.

5.3.2.2 Ammonia

Ammonia due to direct loadings and to the decomposition of organic nitrogen (ammonification) is oxidized under aerobic conditions in the process of nitrification to form nitrite (NO_2^-) and then nitrate (NO_3^-). This process consumes oxygen and, thus, may seriously deplete the water body's oxygen levels. Ammonia nitrogen may be lost by volatilization of un-ionized ammonia (NH_3) from soil or a water body's surface. Ammonium (NH_4^+) is biologically available for plant uptake.

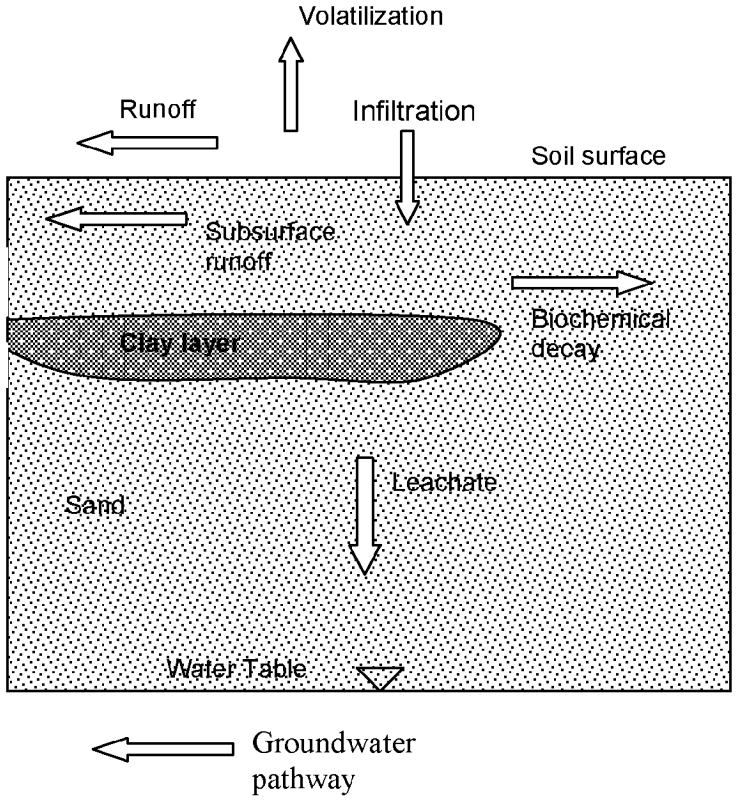

Figure 5.1. Transport pathways of pollutants derived from animal waste.

5.3.2.3 Nitrate

Nitrate is water-soluble and moves freely through most soils. It is produced by nitrification of NH_4^+. Nitrate is biologically available and may be taken up by plants. Under anaerobic conditions, nitrate may be reduced to N_2 by denitrification, a primary process in reducing nitrate in ground water (Crandall, 1999). Denitrification occurs in the absence of dissolved oxygen and in the presence of chemically reduced compounds such as organic carbon or iron sulfide minerals such as pyrite (FeS_2). This process is usually mediated by bacteria, which derive energy from the reaction.

Riparian buffers and wetlands decrease nitrate concentrations and therefore are considered natural sink areas for NO_3^-. It is important to consider both groundwater hydrology as well as biological processes, such as plant uptake, nitrogen fixation, and denitrification, in understanding reductions of nitrogen in riparian buffers. In these areas, denitrification and dilution by discharging ground waters are primary mechanisms for the reduction of nitrate concentrations (Clausen et al., 2000). Whereas the width of vegetated riparian strips is the current focus for mitigating NO_3^- contamination, more attention should be directed to the depth and location of organic-rich riparian sediments, and the groundwater flow path in influencing the ability of riparian zones to remove nitrate (Devito et al., 2000; Mengis et al., 1999).

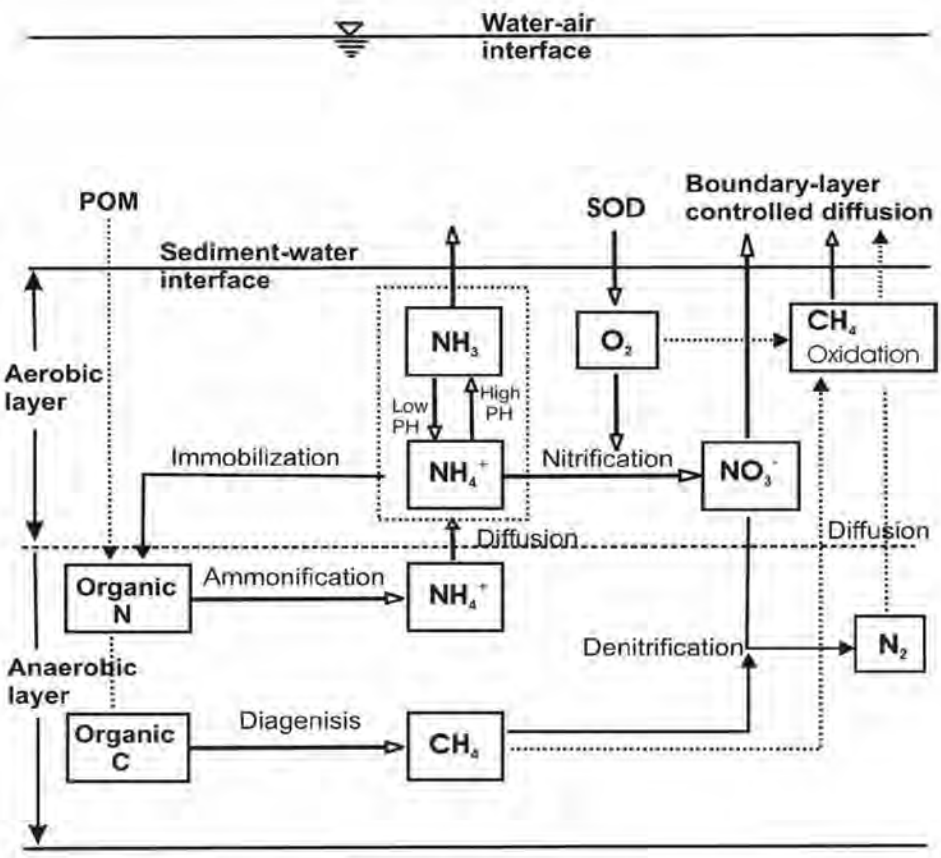

Figure 5.2. Nitrogen-carbon cycling in soil/sediment derived from animal waste.

Nitrate transport in ground water flowing through aquifer sediments occurs by advection (bulk motion with seepage flow) and dispersion produced by molecular diffusion and mechanical mixing through interstitial pore space (Figure 5.3). There is evidence that denitrification may occur at depth in aquifers when ground waters flow through reducing sediments (reduced iron minerals such as iron sulfide and organic-rich sediments) under anaerobic conditions (Korom, 1992, Böhlke and Denver, 1995). This process has the potential of reducing NO_3^- concentrations in ground water significantly (Hantush and Mariño, 2001).

5.3.2.4 Phosphorus

Organic and inorganic phosphorus exist in animal waste. Inorganic phosphate readily adsorbs to soil particles, limiting its potential for leaching through the soil profile. Inorganic phosphate is the plant-available form and is a major contributor to eutrophication of water bodies by stimulating algal growth. Organic phosphorus compounds may be soluble and as such are subject to leaching in the soil (Sweeten, 1991). Most organic forms of phosphorus are readily metabolized to inorganic phosphorus in the soil. Phosphorus adsorption-desorption reactions in the soil govern release of available P (Siddique et al., 2000). Phosphorus binds to clays, organic matter, and Fe and Al oxides, which comprise the most easily eroded soil components (Sims et al., 2000). As such, erosion of soil may generate a P-enriched sediment that may have effects on depositional areas of water bodies. With continual applications of animal waste containing P, the soil may become saturated with P and the potential for both erosion and leaching losses increases. Sandy soils are especially vulnerable to over-fertilization with mineral or organic fertilizers (Sims et al., 1998). Sandy soils lack the fine- grained materials that adsorb P and hold it in the soil. Macropore flow of water may also be a mechanism for the transport of P into groundwater and tile drains (Øygarden et al., 1997).

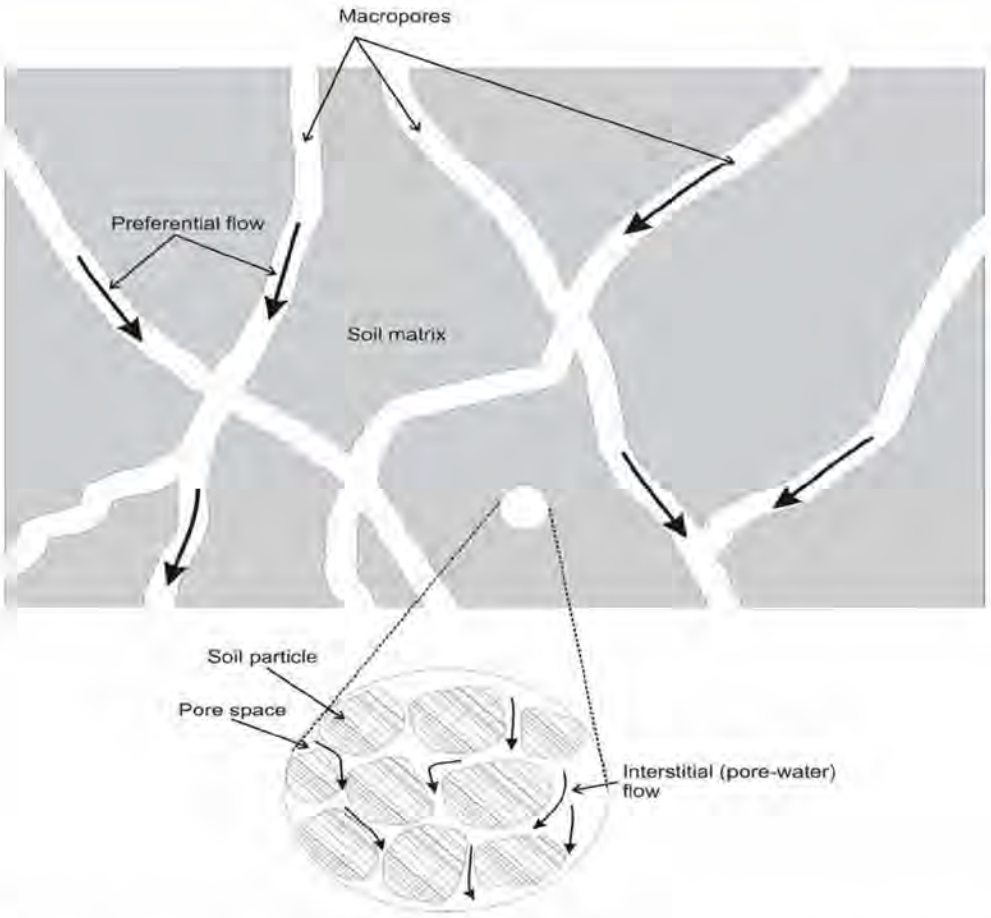

Figure 5.3. Diagrammatic illustration of preferential flow through macropores and interstitial (pore-water) flow in the soil matrix.

Dissolved inorganic P may be higher in concentration than eutrophication thresholds in surface waters (Ryden et al., 1973, Sims et al., 1998). Managing phosphorus to limit its entry into water bodies is a key need in controlling pollution from CAFOs.

5.3.2.5 Pathogens

The fate and transport of microbes in soil and groundwater are controlled by physicochemical characteristics of the microbe and the soil/aquifer media (Robertson and Edberg, 1977). Key characteristics of the microbe include size, inactivation (die-off) rate, and surface electrostatic properties, shape, and specific gravity. Key properties of the soil/aquifer system include soil texture, grain size, porosity, particulate organic carbon content, temperature, pH, and other chemical characteristics of water and mineral composition. Primary mechanisms for the transport and fate of pathogens include advection, retardation, and mortality. Percolating water provides the advective mechanism for downward movement of microbes through soil profiles. In saturated flow, water by-passes the filtering effect of the soil matrix and transports microorganisms long distances in the soil macropores (Mawdsley et al., 1995). Retardation occurs primarily by natural filtering (entrapment) and adsorption, mainly of hydrophobic nature (Carne et al., 1980). Retardation effects provide time for inactivation to eliminate the organisms. Entrapment of microbes by the soil may lead to mortality that is influenced by environmental factors, such as dryness, pH,

predator soil microorganisms, lack of percolation water, and organic matter content (Rosen, 2000). Viruses are generally more resistant to inactivation and more mobile than bacteria in ground water. Typical half-lives for microbes in ground water range from a few hours to a few weeks (Robertson and Edberg, 1977). Greater microbial movement occurs in coarser soils with larger pore sizes. Smaller pore size affects filtration of bacteria and protozoa more than smaller viruses. Macropores transport microbes to greater depths in undisturbed soils due to water flow bypassing the main filtering effect of the soil as it flows through the macropores (Thomas and Phillips, 1979, Mawdsley et al., 1995, McCoy and Hagedorn, 1979). Irrigation soon after manure application may move fecal coliforms into tile-drains fairly rapidly (Geohring et al., 1999). Adsorption of microbes occurs primarily onto charged surfaces of clay and organic matter. Fine-grained soil and aquifer materials have larger surface areas available for adsorption. Due to hydrophobic partitioning of microbes to organic matter, an aquifer that has relatively high organic carbon content will tend to retard the migration of microbes more than an aquifer with little or no organic carbon. The greatest potential movement of pathogens to ground water occurs through sandy soil compared to clay soil. Microbes move faster in fractured rocks than in granular aquifers, primarily for two reasons. First, the former conduct flow much more rapidly, thus providing greater advection of microbes than the latter. Secondly, fractured rocks generally have much less mineral surface area than granular aquifers, thus exhibiting less adsorptive retardation of microbes.

Retardation of microbes in soils depends on several factors, such as size, shape, surface electrostatic properties, and specific gravity. Hydrophobic adsorption on to soil organic matter is a much more important retardation mechanism than soil filtration for most microbes in ground water. Increasing organic carbon content decreases virus mobility and effectively immobilizes virus migration in aquifers. Because of the size and surface electric properties, viruses are much more mobile in ground water than *Cryptosporidium* and *Giardia*. Larger microbes, such as bacteria and protozoa, are more susceptible to filtering in soil than viruses. Hydrophobicity and cell size affect microbial association with soil particles and hence their survival and transport in soil.

Spatial variation of soil pH and temperature influence the transport and survival of microorganisms in soils. Adsorption and movement of viruses and bacteria appear to be strongly correlated with increase in soil pH. Soil temperature affects adsorption and survival of microorganisms through soil. In general, low temperature favors survival of microbes (Hurst et al., 1980).

Plant roots tend to increase the translocation of bacteria through soil (Kemp et al., 1992, Mawdsley et al., 1995). Infiltrating water may accelerate movement through root channels. There is evidence that earthworms enhance transport of bacteria in soils following slurry application (Opperman et al., 1987).

5.3.3 Risk Management

Risk management implies weighing the risks to human health and the environment, against costs associated with potential alternative management strategies (Rosen, 2000). Design of animal waste and wastewater storage facilities, and management of manure-based agriculture require the comparison of associated costs with the risk of groundwater pollution. Measures for groundwater protection may focus on: 1) minimizing seepage of manure and wastewater to ground water; and 2) implementing nutrient best management by adopting specific farming practices.

5.3.4 Storage Facilities

Manure and wastewater may be stored in earthen impoundments (e.g., lagoons) or underground storage tanks. The use of lined lagoons or closed storage tanks depends on site-specific conditions (soil,

hydrogeology, climate, and geography), available material, and economics. Leaching of pathogens or soluble pollutants such as nitrate from earthen impoundments and leaky underground storage tanks constitutes a major concern when the potential of groundwater pollution is a primary component of the risk-management criteria. In general CAFOs should be located away from areas with high leaching potential, such as highly permeable underlying bedrock and soil (EPA, 2001). For example, lagoons should be located on soils with low to moderate permeability or on soils that may form a seal through sedimentation and biological action. Most CAFO facilities are either paved or highly compacted, and therefore relatively impervious. Seepage from storage facilities may be minimized by soil compaction, self-sealing, liners, and soil amendment (EPA, 2001). The associated cost varies across the different measures, with concrete and synthetic liners being the most expensive. A risk-based management approach would require comparing associated costs with the possibility of failure of alternative measures designed to prevent the potential for groundwater pollution at an acceptable level of risk.

Self-sealing with manure solids or by fine organic matter and bacterial cells reduces infiltration and therefore minimizes the leaching potential after a finite period of facility operation (say, a few months). Although this is the least expensive alternative, early in the life of a facility significant leaching may occur leading to increased potential for groundwater contamination by pollutants such as nitrate and pathogens. Relying on self-sealing alone may not be an effective means for reducing leaching potential (Frarey et al., 1994; U.S.EPA, 1998). Sealing is generally effective for cattle manure and in fine-textured soils (high clay content). Liners made of concrete, synthetic material, or compacted clay may be needed under some site conditions (EPA, 2001): 1) a shallow water table; 2) an underlying aquifer used for a domestic water supply or of ecological significance; and 3) highly permeable underlying soil or bedrock (e.g., coarse sand, fractured limestone) (Figure 5.4-5.5). Clay-lined lagoons have the potential to leak and impact groundwater quality (EPA, 1998; Ritter and Chirnside, 1990), since they are susceptible to burrowing worms and cracking as they age. Appropriately sealed below ground storage tanks are effective means for preventing seepage of manure to ground water in sites with porous soils and fractured bedrock.

From a watershed prospective, any practice that reduces infiltration or seepage will reduce the capacity of the soil profile to transmit pathogens and soluble pollutants, specifically nitrate, to ground water. The optimal choice will ultimately depend on incurred costs and acceptable risk level of potential groundwater and surface-water pollution.

5.3.5 Farming Practices

Manure is a beneficial soil amendment and contains nutrients valuable for plants; when managed appropriately this may reduce costs associated with the use of commercial fertilizers. However, stockpiling and land application of manure in excess of crop requirements carry environmental risks, such as surface water and groundwater loading of nutrients (Schepers and Francis, 1998). Composted manure improves soil properties while providing plant nutrients and may save energy by replacing commercial fertilizers; e.g., 3 billion Btu/acre (Deluca and Deluca, 1997). Compost has an advantage over raw manure as it destroys plant and human pathogens and insect larvae.

Ideal management of manure requires: 1) application of manure at agronomic rates; and 2) site management (e.g., tillage, crop residue management, grazing management), which minimize nutrient losses from topsoil and surface water and groundwater loading of pathogens by runoff and leaching. Sound application rates and timing of application reduces losses of nitrogen, especially nitrate, and phosphorus in subsurface drainage water (Randall et. al., 2000). Manure should be applied at agronomic rates, frequently

Photo courtesy of USDA NRCS.

Figure 5.4. Concrete manure storage tank. Structures of this type will prevent leakage of waste into groundwater.

throughout the growing season, rather than a few concentrated applications. This will prevent rapid leaching in coarse-textured soils (high in sand) and avoid runoff in fine-textured soils (high in clay). Although application of manure at agronomic rates reduces nitrogen transport to ground water, it does not eliminate the risk for groundwater pollution entirely (EPA, 1998). This is because: 1) nitrate is highly mobile and may move below the root zone before being taken up by plants; 2) uncontrollable recharge events, such as rain, may cause leaching of excess nitrogen below the root zone; 3) much of the nitrogen applied is in organic form; however, when mineralized it is released in an inorganic form (ammonium and nitrate) potentially available for transport to ground water (not as much if in the ammonium form, due to adsorption to soil particles); and 4) nitrogen transport is affected by manure application method (e.g., drip irrigation, spray irrigation, knifing, etc.). Potential transport of nitrate to ground water is greater in areas of high soil permeability and shallow water tables; thus, application in these areas should be managed appropriately. A great potential exists for nitrogen mineralization when feedlots are abandoned, leading to leaching of nitrate through the soil profile to ground water (Mielke and Ellis, 1976). Planting corn and alfalfa in abandoned feedlots may remove nitrogen as it mineralizes.

Photo courtesy of USDA NRCS.

Figure 5.5. A new lagoon with a synthetic geotextile liner to prevent seepage into groundwater.

Groundwaters in areas of sandy soil, limestone formations, or sinkholes are particularly vulnerable to pathogen transport (EPA, 1998). Pathogens are also prone to movement via macropores. Tillage in the zone above tiles disrupts macropores and reduces transport of nutrients and pathogens to tile drains and ground water (Shiptalo and Gibbs, 2000). Shearing of the macropores by tillage appears to limit microbial transport (Dean and Foran, 1992; and Randall et al., 2000). No-till soils have higher earthworm populations, thus more earth-formed macropores (Shiptalo and Gibbs, 2000). Application of manure immediately after irrigation and in the vicinity of tile drains should be avoided to prevent movement of pathogens (e.g., fecal coliforms) to drainage effluent (Geohring et al., 1999). Factors that need to be considered for minimizing the loss of microorganisms in runoff and leaching include (USDA, 2000): 1) climate conditions; 2) waste application techniques and timing; 3) location of applications.

There is a potential for phosphorus to leach into ground water through sandy soils with high phosphorus content. Land-applied phosphorus is much less mobile than nitrogen because the mineralized (inorganic phosphate) form is highly adsorbed onto soil particles. High application rates may result in the accumulation of particulate and soluble forms of P that are potentially available for transport through earthworm burrows and other preferential paths to tile drains and the water table.

From a watershed prospective, measures to reduce movement of nutrients and pathogens through the soil matrix and flow-through macropores (preferential flow) would reduce the potential for groundwater pollution. This would require sound farm practices focused on application rates and timing of manure application based on local climatic conditions and location. Different levels of management may be

appropriate for different areas of a watershed. Larger areas where freely draining soils, high manure and fertilizer N applications are made should occur on the upper boundaries of the watershed. Areas most susceptible to P loss should not be located near the stream channel and should constitute a much smaller fraction of the watershed (Sharpley et al., 1998).

5.3.6 Natural Filters

The most common practices to reduce runoff, leaching, and drainage from CAFOs include: 1) terraces; 2) cover crops; 3) filter strips and riparian buffers; and 4) wetlands.

Terraces reduce runoff and soil erosion. Measures to stop erosion may significantly decrease particulate and dissolved forms of P loss (Withers and Jarvis, 1998). Cover crops use available nutrients in soil, especially nitrogen, thus preventing or decreasing leaching. However, terraces depending on soil type may promote infiltration into ground water. Figure 5.6 shows a terrace built between two fields to limit the erosion of soil on sloping land.

Photo courtesy of USDA NRCS.

Figure 5.6. Terraced fields to limit the erosion of soil on sloping land.

Filter strips and riparian buffers include grass, shrubs, and trees along the riparian interface with cropland and pasture. They are designed to intercept undesirable contaminants (e.g., sediments, manure, pathogens, fertilizers, pesticides, etc.) from surface water and subsurface flows (EPA, 2000). Filter strips/riparian buffers may be effective treatment of overland and shallow subsurface flows for nitrogen and particulate phosphorus removal. Managing riparian zones with the intent of mitigating NO_3^- contamination

needs to be refocused on characteristics more important than specific buffer width, such as depth of riparian sediments, groundwater hydrology in that vicinity, and the location of organic-rich sediments (Devito et al., 2000). Denitrification and dilution processes are primarily responsible for the removal or reduction of nitrate in groundwaters discharging through riparian sediments (Clausen et al., 2000). Plant uptake may reduce nitrate concentrations in riparian buffers.

Wetlands occur when the water table intercepts the land surface near streams. Nitrate is primarily reduced by denitrification and dilution by upwelling ground water in the wetland area. Constructed wetlands are low maintenance systems that may reduce nitrate from agricultural drainage in artificially drained watersheds (Kovacic et al., 2000). Anaerobic conditions in the presence of organic matter promotes denitrification of NO_3^-, which may be further reduced by plant uptake and mixing with nitrate-free discharging ground waters.

The role of riparian buffer zones and constructed wetlands as nutrient sinks has implications on management of CAFOs in watersheds. Given acceptable levels of risk, the management of animal waste and manure-based agriculture at the watershed scale may be significantly impacted by considering the potential for removal of nutrients naturally, especially nitrate from subsurface drainage in wetlands and riparian buffer zones.

6 Air Transport and Deposition

Water and air quality issues are related. There has been a lack of CAFO-related research to deal with both water and air quality issues in a holistic (systems) approach while maintaining high standards of confined livestock productivity, animal health, and production cost efficiency (Sweeten 2001; Sweeten et al., 2000). Concentrated animal feeding operations may consist of open lots or confinement buildings, manure/wastewater storage or treatment systems, land application areas, and facilities to handle animal mortalities. CAFOs may generate many types of wastes, which include manure (feces and urine), waste feed, water, bedding dust, and waste water. Air emissions originate from the decomposition of these different types of wastes from the point of generation through the management and treatment of these wastes on the site. The rate at which the air emissions are generated will vary as a result of several operational variables (housing type, animal species, and waste management system), and weather conditions (humidity, temperature, wind direction and the time of a wind release). The air emission burden on the atmosphere is the product of the contaminant concentration and the airflow rate (USEPA 2001).

6.1 Current Air Quality Issues Associated with Agriculture

Six major pollutants have been identified and attributed to air emissions from animal housing areas, animal waste treatment and storage areas, and application of animal waste to the land. An overview of these pollutants follows.

6.1.1 Ammonia

Ammonia is an inorganic nitrogen compound that is easily emitted to the atmosphere from animal wastes (USEPA 2001). Ammonia is one of the fixed gases of aerobic and anaerobic decomposition of organic wastes. The major source of ammonia in animal manure is urea from urine or uric acid (in poultry). During microbial breakdown of fecal material in confinement buildings, on feedlot surfaces, in stockpiles, and in lagoons or runoff retention ponds, additional ammonia and amines are produced. Ammonia evolution rates are a function of time, temperature, pH of the manure surface, and level of biological activity. Ammonia volatilization is probably the most important pathway for on-site loss of nitrogen in animal manure to air and water resources. When ammonia is present as part of an aqueous solution, it reacts with acid to rapidly form the ammonium ion, with little release of ammonia to the atmosphere. Most animal manures, feedlot surfaces and lagoons would typically be a non-acidic environment with a pH greater than 7.0, where a rapid loss of ammonia to the atmosphere will occur. Total nitrogen losses as ammonia may exceed 50% (Sweeten et al., 2000; USEPA 2001).

Anaerobic lagoon and waste storage ponds are main components of the waste management systems at many CAFO sites. These systems depend on microorganisms to mineralize organic nitrogen to ammonium and ammonia. The ammonia will continually volatilize from the surface of the lagoon and pond. As much as 70%-80% of the nitrogen in a lagoon changes from liquid to gas, which will escape into the atmosphere in a process known as ammonia volatilization. Depending on the amount of carbon-rich bedding used, the more carbon, the lower the ammonia emissions. Bedding is used when the manure is not liquefied, and the bedding with absorbed manure and urine is stored in a solid form. The bedding creates a porous mixture wherein free air space provides conditions suitable for aerobic microbes to flourish. The decomposition of solid manure by aerobic bacteria begins a heating process known as composting. This decomposition process produces heat, water vapor, carbon dioxide, and ammonia. Only ammonia is odorous, and its emissions are low if the farmers use enough carbon-rich bedding to keep wet spots in the

beds covered and maintain a high carbon/nitrogen ratio in the manure-bedding mixture. The gaseous ammonia returns to earth, precipitated from the atmosphere by rain or trapped by trees, grass, or water bodies, in a process known as atmospheric deposition. For example, a typical five-acre hog waste lagoon releases 15-30 tons of ammonia into the air annually. Approximately half of the ammonia rises as a gas and generally falls to forests, fields, or open water within 50 miles, either in rain or fog. The rest is transformed into dry particles that travel up to 250 miles. Ammonia is the most potent form of nitrogen that triggers algae blooms and causes fish kills in coastal waters. The North Carolina Division of Water Quality estimates that hog factories constitute the largest source of airborne ammonia in North Carolina, more than cattle, chickens, and turkeys combined. In 1995, Hans Paerl, a marine ecologist from the University of North Carolina, reported that airborne ammonia had risen 25% each year since 1991 in Morehead City, 90 miles downwind of the hog belt (Halverson, 2000).

At concentrations found in the livestock facilities (< 100 ppm), the primary impact of aerial ammonia is as an irritant of the eye and respiratory membranes. The impact of aerial ammonia as a chronic stressor may affect the course of infectious disease and directly influence the growth of young animals (Sweeten et al., 2000; Merchant et al., 2002). Ammonia is recognized as a human toxin. Because ammonia is water-soluble, it is rapidly absorbed in the human upper airways, which results in damaging the upper airway epithelium. Moderate concentrations of ammonia (50-150 ppm) may lead to severe cough and mucous production. For example, exposure to 100 ppm for 30-second periods leads to nasal irritation, and nasal airway resistance increases. Lower concentrations (7 ppm) of ammonia adsorbed to respirable particles may reach the alveoli (Merchant et al., 2002). Higher concentrations of ammonia (> 150 ppm) may cause scarring of the upper and lower airways. A consequence of these inflammatory responses is reactive airway dysfunction syndrome and associated persistent airway hyper-responsiveness. At much higher ammonia concentrations, the ammonia may pass the upper airways to cause lower lung inflammation and pulmonary edema. Chemical burns to the skin and eyes may also occur. Massive exposure (in the range of 500 ppm) to ammonia may be fatal.

6.1.2 Nitrous Oxide

Nitrous oxide is one of the most potent agricultural greenhouse gases that contribute to global climate change. Nitrous oxide is produced in the nitrogen cycle during nitrification and denitrification of the organic nitrogen in livestock manure and urine. The emission of nitrous oxide is a function of the nitrogen content of the manure, the length of time the manure is stored, and the specific type of manure management system used. Nitrous oxide is released from natural processes in the soil, from nitrogen fertilizer, fossil fuel combustion, animal and human wastes, water bodies, biomass burning, and land clearing. The amount of nitrous oxide emitted tends to be small from manure because pH-dependent environmental conditions are often not suitable for nitrification to occur. Nitrous oxide has over 200 times the warming effect of carbon dioxide and lasts 150 years in the atmosphere. It is the least prevalent of the agricultural gases that contribute to the greenhouse effect, contributing only about 3% of the global warming burden (USEPA 2001;Agriculture and Agri-Food Canada 1998; Halverson 2000).

6.1.3 Methane

Methane is colorless, odorless, lighter than air, and is another one of the highly potent greenhouse gases that contribute to global climate change. Methane has a long residence time in the atmosphere (5-10 years). It is produced during the normal digestive processes of animals and the decomposition of animal manure. When the organic material from livestock manure is placed under anaerobic conditions, large populations of methanogenic bacteria are enriched, producting large quantities of methane. The main factors that influence methane emission from livestock manure are the methane-producing potential of the

waste and the proportion of the manure microbial population able to produce methane. These main factors will depend on how the manure is stored, treated as a liquid, handled as a solid, and the length of time before manure deposition on pastures and rangelands. When livestock manure decomposes aerobically, little or no methane is produced (Merchant et al., 2002; Agriculture and Agri-Food Canada 1998; USEPA 2001).

6.1.4 Carbon dioxide

Carbon dioxide is a naturally occurring, voluminous greenhouse gas and is emitted into and removed from the atmosphere on a continuous basis. Carbon dioxide emissions are produced during microbial degradation of animal manure under aerobic and anaerobic conditions. When animal wastes are stored as liquid waste, an increase occurs in the amount of carbon dioxide produced and emitted compared to dry storage. Carbon dioxide emissions may frequently occur from the combustion of biogas from anaerobic digesters used to recover energy (USEPA 2001; Halverson 2000).

6.1.5 Hydrogen sulfide

Hydrogen sulfide is a potentially lethal gas produced by anaerobic bacterial decomposition of protein and other sulfur containing organic matter. This colorless gas with the distinctive odor of rotten eggs is heavier than air and may accumulate in manure pits, holding tanks, and other low areas in a livestock facility. The production of hydrogen sulfide is dependent on the outside air temperature, the size of the housing and waste management areas, the air retention time in the housing areas, and the daily sulfur intake of the animals. The sources of hydrogen sulfide presenting the greatest hazard in an agricultural setting are liquid manure holding pits that are commonly located under the slatted floors of livestock facilities. Although most of the continuously produced hydrogen sulfide is retained within the liquid of the pit, the gas is rapidly released into the ambient air in small quantities when the waste slurry is agitated to suspend solids prior to being pumped out. While the concentration of hydrogen sulfide found in closed animal facilities (<10 ppm) is not harmful, the release of this gas from the manure slurry agitation may produce concentrations up to ≥ 1000 ppm. Hydrogen sulfide is an irritant gas that produces local inflammation of the moist membranes of the eye and respiratory tract. Respiratory tract symptoms include irritation of the throat and a cough. Exposure to concentrations (> 150 ppm) of hydrogen sulfide may impair the sense of smell, hindering the olfactory detection of high concentrations of the gas. Chronic or acute occupational exposure to hydrogen sulfide concentrations at elevated levels between 100 - 1000 ppm may cause rapid loss of consciousness, shock, acute respiratory distress syndrome (ARDS) or pulmonary edema, coma and death. The primary mode of absorption of hydrogen sulfide is through inhalation. The toxic effects of hydrogen sulfide are based on its property as a chemical asphyxiate. It binds to the mitochondrial enzyme cytochrome oxidase, blocking oxidative phosphorylation and ATP production. This leads to anaerobic metabolism and the development of lactic acidosis (USEPA 2001; Thu 2001; Merchant et al., 2002). Few states, with the exception being Minnesota, have hydrogen sulfide standards. Other states have different standards (Sweeten et al., 2000; USEPA 2001; Halverson 2000;Yale Center for Environmental Law and Policy).

6.1.6 Criteria Air Pollutants

Criteria air pollutants include volatile organic compounds (VOCs), and particulate matter (USEPA 2001). Many VOCs are formed when the livestock waste is in a dynamic state, fluctuating between aerobic and anaerobic conditions. VOCs are formed when the hydrolytic and acetogenic bacteria ferment the organic matter in the waste. Some of the volatile organic compounds that emanate from CAFO facilities include acetaldehyde, acetone, acetophenon, acrolein, benzaldehyde, benzene, bis(2-ethylhexyl) phthalate, 2-butanone, carbon disulfide, carbonyl sulfide, chloroform, crotonaldehyde, ethyl acetate, formaldehyde,

formic acid, hexane, isobutyl alcohol, methanol, 2-methoxyethanol, naphthalene, phenol, pyridine, tetrachloroethylene, toluene, triethylamine, and xylene. Other air pollutants associated with CAFO facilities include volatile fatty acids (VFAs) and odor compounds. The incomplete anaerobic degradation of carbohydrate, protein, and lipid components in livestock waste results in the formation of short-chain VFAs (Varel, 2001). The VFAs produced include butyric, isobutyric, caproic, isocaproic, valeric, isovaleric, propionic, phenylpropionic, lauric, acetic and phenylacetic acids (Merchant et al., 2002). The odor compounds emanating from CAFOs include the phenolic compounds, such as phenol, ethyl phenol, and cresols, and the nitrogen-containing compounds, such as ammonia, amines, pyridines, indole, skatole, trimethylamine, trimethyl pyrazine, and tetramethyl pyrazine (Merchant et al., 2002).

Particulate matter is identified as either PM-10 standard (less than 10 μm in diameter) and PM-2.5 standard (less than 2.5 μm in diameter, referred to as respirable particulate matter). Particulate matter is a consequence of interactions of animals with their environment. Particulate matter is composed of animal bedding, fecal matter, litter, feed materials, animal byproducts such as skin cells or feathers, and the products of microbial action on feces and feed, bacteria, fungi, viruses, metals, and hormones. Components of feed include plant proteins, starches, and carbohydrates, feed additives such as vitamins, minerals, amino acids and other supplements, and antibiotics (Merchant et al., 2002).

6.2 Generation of Air Emissions Resulting from Operational Variables

6.2.1 Air Emissions from Land Application Activities

The amount of nitrogen released into the environment from the application of animal waste depends on the rate and method by which it is applied, the quantity of material applied, and site-specific factors (such as air temperature, wind speed, and soil pH). The application of animal waste from CAFOs on cropland generates air emissions. The emissions are the result of volatilization of ammonia immediately after the material is applied to the land. Additional emissions of nitrous oxide are released from farmlands when nitrogen is applied to the soil and at the same time the soil is undergoing the process of nitrification and denitrification. Loss of nitrous oxide through denitrification depends on the oxygen levels of the soil to which the manure is being applied. Low oxygen levels (as a result of wet, compacted, or warm soil) increase the amount of nitrate-nitrogen that is released into the air as nitrogen gas or nitrous oxide. For example, research performed by Sharpe, et. al. (1977), compared losses of ammonia and nitrous oxide from sprinkler irrigation of swine effluent. The study concluded that the ammonia emissions made the larger contribution to airborne nitrogen losses (U.S. EPA, 2001). The analysis of air emissions from land application activities mainly focuses on the volatilization of nitrogen as ammonia, because the emission of other compounds is expected to be less significant. Figures 6.1 and 6.2 show potential sources for air emissions of pollutants of concern. High velocity sprinklers may release significant amounts of ammonia and VOCs into the air as well as generating particulates that may move off site if the wind velocity is high. Similarly, application of animal waste from tank trucks may release large amounts of odor compounds and ammonia into the air. Incorporation of the waste into the soil limits losses of odor compounds and ammonia but increases the cost of application.

In addition to the movement of nitrogen in various forms from land-applied waste, bioaerosols or particulates of biological origin may move from land-applied waste. Fragments of cell walls, fungal spores, hyphae, endotoxins, plant cell debris, animal cell debris, and whole cells may all be aerosolized from land-applied wastes. Little information exists with regard to the importance of organic dust movement in the environment.

Photo courtesy of USDA NRCS.

Figure 6.1. High velocity sprinkler, a potential source of airborne contaminants.

Photo courtesy of USDA NRCS.

Figure 6.2. Tank truck applying manure with the potential for aerosol generation.

6.2.2 Odors

CAFOs may affect air quality through emissions of odorous gases (odorants), particulates, and some of the "greenhouse" gases (carbon dioxide, and methane). The odor may affect the health of, and become a nuisance to, nearby residents. The odor created from CAFO sources is the composite of ≥170 different gaseous compounds present in livestock manure in trace concentrations above or below a person's olfactory thresholds. Odor is characterized according to the following characteristics: (a) the strength of the odor (the concentration or intensity); (b) the frequency of the odor (the number of times the odor is detected during a period of time); (c) the duration of the odor (the period in which the odor remains detectable); and (d) the perceived offensiveness, character, or quality of the odor. Some of the general approaches in estimating the strength or intensity of livestock manure odors are: (a) sensory devices (e.g., scentometer, dynamic olfactometers, absorption media, etc.) that involve collecting and presenting odor samples (diluted or undiluted) to trained evaluators under controlled conditions; (b) direct or indirect measurement of concentrations of distinct odorous gases; and (c) electronic "nose" devices, a series of gas sensors combined with pattern recognition software to mimic human olfactory responses. The electronic nose device registers the presence, concentration, or activity of selected odorous gases. Odor frequency and duration are partially governed by climatic conditions, in addition to atmospheric stability, moisture conditions, and wind-direction frequency.

Anaerobic degradation involves the reduction of complex organic compounds to a variety of odorous VFAs by acid-forming bacteria. Methane-forming bacteria convert VFAs to odorless methane and carbon dioxide. If these anaerobic processes are in balance, most odorous compounds are eliminated. However, under certain conditions in manure storage or overloaded anaerobic treatment lagoons, acid-forming and methane-forming processes are not in balance, resulting in an accumulation of VFAs. Also, sulfate-reducing bacteria found in anaerobic environments convert sulfate to hydrogen sulfide and other sulfur-containing compounds. Anaerobic degradation by sulfate-reducing bacteria and an imbalance of acid- and methane-forming bacteria are significant sources of odorous compounds (Midwest Plan Service).

Jacobson et al., evaluated odor and hydrogen sulfide concentration in air from 60 different pig, dairy, beef, and poultry manure storage units on farms. A low correlation was found between hydrogen sulfide and odor concentration for manure storage based on a species comparison and for production systems grouped according to manure management system type (basin, lagoon, and pit) (Zahn et al., 1997, 2001).

6.2.3 Particulate Matter

Particulate matter is solid matter or liquid droplets less than 100 μm in diameter from dust, smoke, fly ash, and condensing fugitive vapors that are carried in the outdoor air. Air quality standards have been developed to protect public health from the potential effects of particulate matter less than 10 microns (PM-10), and particulate matter less than 2.5 microns (PM-2.5) in size (Nebraska Dept. Environ. Qual., 2001). When humans or animals inhale dust, a higher proportion of small particles than large particles will travel deep into the lung and be deposited. In general, finer particulate fractions contain a higher proportion of anthropogenic dust and lower levels of wind blown soil and plant pollens. Because lung problems associated with CAFOs include airway disease, it is important to consider inhalable particulate fraction and PM-10 (Merchant et al., 2002).

Bioaerosols are a major component of the particulate matter from CAFOs. Bioaerosols are simply particles of biological origin that are suspended in the air. Bioaerosols include bacteria, fungi, fungal and bacterial spores, viruses, mammalian cellular fragments, pollens, and aeroallergens, toxins, and particulate waste products. Bacterial products or components exist as bioaerosols and include endotoxins, exotoxins,

peptidoglycans, lipoteichoic acids, and bacterial DNA bearing CpG motifs. Fungal products or components include conidia and microconidia, hyphal fragments, mycotoxins and glucans. Various concentrated animal feeding operations are sources of bioaerosols because of the feed material used, the fecal material produced, and the type of bedding material used (Merchant et al., 2002).

Bioaerosols are a respiratory threat to workers performing waste management activities at concentrated animal feeding operations. Inhalation of pathogenic microorganisms may result in an acute disease, with full-blown infections. For example, acute endotoxin inhalation exposure may result in influenza-type symptoms. Chronic endotoxin exposure has been associated with decreased respirometric values (e.g., hypersensitivity pneumonitis) in workers associated with concentrated animal feeding operations. Several studies describe "Organic Dust Toxic Syndrome," which is a health effect associated with particulate exposure (such as asthma).

Some CAFOs have installed engineering controls, (such as ventilation systems) to lower worker exposure to bioaerosols. These ventilation systems will discharge a relatively high concentration of bioaerosols to the environment, unless air treatment unit processes are also installed. The ventilated aerosols that are not treated may cause an air plume to travel beyond property lines. Several factors will determine the downwind concentration of a CAFO generated bioaerosol, some of which include: (1) the distance to the property line; (2) the wind velocity and direction; (3) the biological half-life; (4) the humidity; and (5) the amount of ultra-violet light present. There were not any studies in the literature that evaluated public health exposure beyond a reasonable distance from a CAFO system.

6.3 SUMMARY

Since the early 1970's, very little consideration has been given to air quality protection with respect to agriculture. This has resulted in very little data existing to determine agriculture's impact and contribution to air quality. Significant issues related to agriculture and air quality were presented and informational gaps were assessed to determine the type and amount of resources needed to address issues related to air quality and agriculture.

Animal and production agriculture may produce emissions of odorous gases such as ammonia, hydrogen sulfide, volatile organic compounds/acids, and particulate matter. Current knowledge does not fully describe or reflect potential air emissions produced from these pollutants.

7 RISK MANAGEMENT OPTIONS FOR CAFO WASTE

Now that the risks associated with the large amounts of animal manure present at CAFOs have been described, this document will now discuss what may be done to mitigate CAFO manure pollution. This section will be divided by strategies that are well known, those requiring some additional research, and those strategies that are new and innovative and require significant additional research to fully implement. Within each section we will describe how the strategies discussed will mitigate each of the stressors identified in this document: nutrients, pathogens, EDCs and antibiotics.

Two well known risk management strategies, discussed in detail below, are land application and composting. Land application is the main means by which animal manure from CAFOs is disposed. This often results in excessive application that results in release of manure stressors into the environment. This makes land application part of the problem. It may also be part of the solution if done properly.

7.1 Land Application

This section summarizes the benefits and risks associated with land application of CAFO waste. Application of animal waste to land presents a complex set of topics for consideration. Animal manure has been applied to soil primarily as a disposal operation since the Roman Empire. Similarly, use of animal manure to enhance soil fertility has been known for about as long, but the underlying reasons were only illuminated within the last 150 years. Manure as a fertility agent has several benefits for agricultural production. The advantages come from the value of animal manure as a fertilizer and soil conditioner (Kellogg et al., 2000; USDA/NRCS 1996,1998; Weidner et al., 1969). The nitrogen and phosphorus content of manure has a real value, when substituted for inorganic chemical fertilizer (Bitzer and Sims, 1988;Edwards and Daniel, 1992). The soil conditioning aspect is important. As soil organic matter increases, soil workability improves leading to lower power requirement for equipment. Water holding and infiltration improve leading to greater drought resistance. Nitrogen, phosphorus, and potassium are recycled into the soil with applied manure, thus maintaining fertility. Major portions of N and P in manure are in organically bound components, which function as slow release nutrient sources. The organic matter component of manure maintains or enhances the soil organic matter fraction. The benefits of manure application to soil are well recognized. For most purposes the smaller farm operations may gain the benefits with relatively minor problems.

The liability comes from the need to have adequate land for disposal/treatment, the cost of application including capital costs, labor and transportation costs and the potential environmental liability, should a nearby water body be contaminated by wastes. The task of balancing the advantages and disadvantages lies in successfully measuring the nutrient content of manure and calculating application rates (Iowa State Univ. 1995; Maguire et al., 2000; USDA 1979; USDA/NRCS 1996,1998; Weidner et al., 1969). Allowances must be made for the available N from manure, losses to atmosphere as NH_3, and potential variation in application. Managing application by N content usually results in over-application of P. Managing by P content under supplies nitrogen leading to a need to add inorganic N. Since there are differences in application equipment for manure or inorganic fertilizer, that portion of costs increases.

Every segment of animal agriculture production has examples of waste load exceeding the absorption capacity of the local environment. As discussed in the beginning of this document, the problem derives from concentration of production facilities into relatively small land areas, with little space available

for waste disposal. Some facilities market the waste as fertilizer material, but the transport distance becomes the limiting economic factor (Bosch and Napit 1992). The key question for consideration in this risk management evaluation is how to properly use land application to reduce the risk to water quality from CAFO manure while still realizing its many tangible benefits. Answering this question requires an examination of how manure is currently used and how it may be used more efficiently.

Numerous documents exist providing guidance to the farm operators on every aspect of application of manure to soil. There are documents produced by the USDA, States, and universities that provide examples of how to calculate the fertilizer value of different wastes. The publications provide models of how to substitute manure for inorganic fertilizer to meet yield goals. The key factor is that every facility presents a unique situation with regard to soil type, waste type, soil conditions, erosion potential, and climate. There are no universal solutions for using CAFO wastes as a fertilizer source. Some general principles do apply however. Application rates should be based on the more restrictive crop phosphorus requirements. Waste application should be timed to provide maximum benefit for crops. Manure should not be spread on land in winter where the ground is frozen. Wherever possible, incorporation should be done within 24 hours of application. Soil management to minimize erosion will help mitigate any runoff problems associated with manure. This section is intended to provide an overview of the practices used in land application, some of the problems attendant with land application, and some management practices to minimize problems. The literature citations provided represent a small fraction of available material concerning the subject.

7.2 Practices Used in Land Application

7.2.1 Application Systems

Transport of manure from the site of production or storage to the fields where it is applied may take many forms. Some are simple load and spread systems. Some are more complex with mixing, shredding, pumping and distribution machinery involved. The type of system used varies with the characteristics of the waste being handled. Different animal production facilities have elected different waste handling modes that are most commonly based in ease of operation and cost. Liquid manure application may take several forms (Doughherty et al., 1998). Tractor drawn or truck mounted tank systems may either broadcast or directly inject liquids (Figure 7.1). Tractor pulled broadcast or injection applicators can be supplied by drag hoses or temporary holding tanks. This option reduces potential soil compaction.

Irrigation application may be flood type, gated channels, or various kinds of sprinkler systems. Sprinkler systems may be manually moved, fed from a central pumping station; fixed installation; or center pivot type with central pumping. Use of irrigation type systems may be limited to larger facilities in some cases simply because irrigation systems need a minimum flow volume to function properly. A major drawback to spray irrigation systems for the application of liquid manure is the loss of NH_4-N to the atmosphere as NH_3. The value of the N is lost and the odor potential is high for sprayer systems. Irrigation may serve two functions, one to supply nutrients and the other to supply water to meet crop needs. In some ways, liquid systems may be more limited than others. Installed irrigation equipment is not easily moved; therefore, the same land is repeatedly treated with manure. Other nearby land potentially suitable for receiving manure may be passed over.

The major animal production sectors use different waste handling systems. Factors involved in the elected choices vary from locale to locale. Available data are limited and apply to large production facilities. Some examples of manure distribution systems are listed in Figure 7.2.

Photo courtesy of USDA NRCS.

Figure 7.1. Tractor drawn liquid manure application after corn harvest.

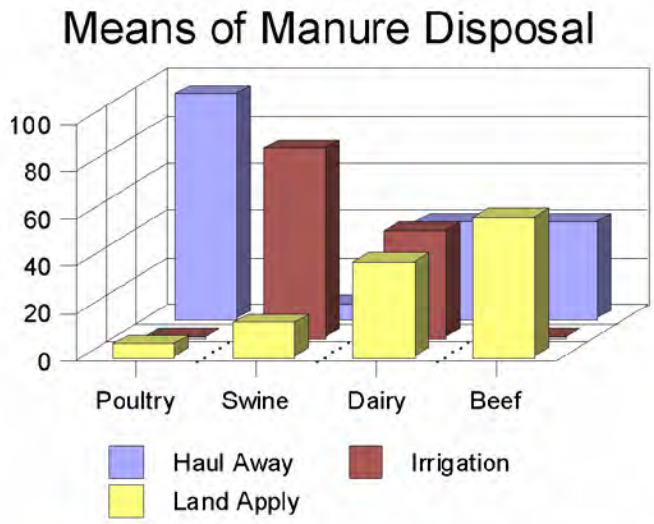

Figure 7.2. Means of manure disposal by animal sector.

7.2.2 Potential Problems Associated with Manure Applications

Although the problems associated with nutrients, pathogens, EDCs, and antibiotics in manure are common to all species of livestock, some additional problems are posed by the way in which the manure is disposed. This is related to the moisture content of the manure, which is related to the species of livestock in question. As shown in Figure 7.2, almost all of the manure generated by poultry facilities is sent off-site

for disposal. Environmental pollution resulting from runoff is probably not a big problem at these facilities as a result of this practice. Nevertheless, myriad problems could result from the off-site transport of poultry waste because the nutrient and pathogen load of the waste will be out of the direct control of the originating facility.

Over-enrichment with N and P may occur when liquid waste is sprayed on land as is done at swine CAFOs. Air pollution may result from volatilization of NH_3 when downwind transport occurs as a result of spray irrigation using liquid waste and wastewater. Runoff of oxygen demanding substances, nutrients, and pathogenic organisms to water bodies may accelerate eutrophication of receiving water and spread pathogenic microorganisms throughout the watershed. (Baxter-Potter and Gilliland, 1988; Culley and Phillips, 1982; Doran and Linn, 1979; Doran et al., 1981; Edwards and Daniel, 1992; Gagliardi and Kerns, 2000, Giddens and Barnett, 1980; Gilley and Eghball, 1998; Jawson et al., 1982; Larsen-Royce et al., 1994; Pell 1997; Smith et al., 1985; Wolf et al., 1988).

Transport of nutrients and microorganisms to groundwater may also occur from both the application of liquid waste and the spreading of solid manure on land. Another avenue for nutrient losses exists in the leaching of soluble nutrients either to groundwater or drainage tile (Entry and Farmer, 2001; Evans et al., 1984; Gangbazo et al., 1995; Simpson 1990). N applied in manure as NH_4^+ will exchange on to soil cation exchange sites. This form of N does not readily move, but may be nitrified to NO_2^- and NO_3^- (Eghball 2000) that are freely mobile in soil water. Subsequently, denitrification may reduce the NO_3/ NO_2 to N_2O or N_2 (Rochette et al., 2000; Stevens et al., 2001)

Even the subsurface injection of solid manure may contaminate water sources as the result of channel flow through the vadose zone. The channels may take the form of worm burrows, root channels, or animal burrows. P usually rapidly converts to insoluble forms, but with high application rates and rainfall, P will move as soluble P. Water-soluble organic N and P may also move into groundwater or drainage tile. Movement of NO_3^- into groundwater may increase NO_3^- levels above the federal standards of 10 mg/L. Too much NO_3^- in water presents a risk to very young children by causing methemoglobinemia (already been said). Loss of N and P to drainage tile primarily represents loss of the fertilizer value of the applied manure. It also increases the potential for eutrophication of receiving waters.

The bacterial load of animal waste either applied to the soil surface or injected below ground may enter the channels existing in the soil and migrate into drain tile. If water flow is relatively large, the water may transport organisms including pathogenic organisms to receiving streams, lakes, or ponds. This pathway is easily overlooked as it is assumed that water entering drain tile has been filtered through the overlying soil. Studies of the movement of bacteria through the soil profile are recent. Entry and Farmer, 2001 examined coliform and nutrient movement in a sand aquifer below fields irrigated with river water. Smith et al., (1985) also showed that *E. coli* could move through soil most easily in undisturbed soil columns. Tilled soil was more effective in retarding the movement of the organisms. Gagliardi and Kerns, (2000) reported that *E. coli* O157:H7 could move through agricultural soils under different management practices. Patni et al., (1984) studied the bacterial quality of water in tile drains under manured and fertilized cropland. Their results showed that bacteria could move easily through the soil profile. Shipitalo and Gibbs, (2000) showed that injected manure could move to tile drains within minutes of application through worm burrows. The width of the transmission zone was about one meter at the soil surface.

Because movement of microorganisms through soil profiles has been observed, it is also likely that EDCs and antibiotics may move with the water flowing through the same channels that allow passage of the microorganisms.

7.2.3 Soil Management Practices to Reduce Problems

Control of potential pollution from land-applied manure requires attention to good soil management practices (Cook et al., 1996; Dillaha et al., 1986; Young et al., 1980). Soil management to reduce erosion losses will reduce potential manure runoff losses of oxygen demanding compounds, N, and P. The most important factors contributing to or limiting erosion include: degree of slope, susceptibility of soil to detachment, crop cover, rainfall, and presence of erosion control practices (Cook et al., 1996; Dillaha et al., 1986; Liu et al., 2000).

7.2.4 Runoff Control from Land Application Fields

Runoff from the immediate CAFO operation is best controlled at the source as described above. However, runoff control in a land application of animal waste is not as easily managed. The large areal coverage typical in land application makes management of the waste more difficult. In most applications, the primary stressor of concern will be the nutrients. Nitrogen as found in animal waste is soluble and will be transported via the water (Eghball 2000). Phosphorus, , however, is particle-bound and will be transported through erosion and sediment transport. Effective controls for phosphorus will require measures to prevent the detachment, transport, and deposition of soil particles to a receiving water. Typical erosion control strategies may be used to minimize the SSAS and associated stressors delivered to a water body.

In a land application of waste, the most effective management for SSAS is to retain the soil and solids applied to the field. There are three primary points to reduce the SSAS from land application: 1) reduce soil detachment, 2) reduce transport within the field, and 3) trap sediment after the field.

7.2.4.1 Reducing Soil Detachment

To effectively reduce the soil particle detachment, the energy from a falling rain droplet must be adequately dissipated. Crop cover and crop residue may dissipate energy to varying degrees depending on the extent and type of coverage (Woo et al., 1997). Accepted conservation practices such as conservation tillage, cover crops, contour farming, buffer strips, riparian buffer, and effective pasture management may significantly reduce the soil detachment due to direct rainfall.

Conservation tillage reduces vulnerable soil exposure by maintaining a cover crop and/or crop residue on the soil surface. Examples of conservation tillage include preparation of seedbed bands only for rowcrops, chisel plowing or disking to incorporate plant residues vertically into the soil surface rather than turning under as with a traditional plow. Approximately 45% of crop production in the US occurs with conservation tillage. Use of reduced tillage is not conducive to incorporation of applied manure. Similarly, tillage of pastureland or hay production field would not be done. Chisel plow type injection could be used on these lands to a limited extent. Leaving crop residues on the soil and planting cover crops will reduce raindrop impact on the soil, thus reducing the detachment of soil particles that could erode.

On sloping land, contour strip fields may be used to control water flow (Liu et al., 2000). Alternate strips of different crops are planted perpendicular to the slope to reduce water velocity and retain sediments. Crop rotation may reduce runoff by including a hay type crop between row crop years. The potential soil erosion from hay is much less than row crops. Provision of buffer zones, terraces, filter strips, and windbreaks may all reduce soil erosion by slowing the speed of water and wind across the soil surface. These measures may also collect particulates in motion, preventing them from reaching larger streams.

Proper pasture management may reduce pollutant movement. The best time to apply manure to hay acreage is subsequent to removal of the last crop. Then there would be a substantial time for the manure to be absorbed with little risk of bacterial contamination of harvestable crops. Similarly, manure may be applied to wheat and oat fields after harvest of the grain and straw. The manure could be absorbed prior to seeding of the next crop or as the soil is prepared for the next crop.

Atmospheric losses of N may be curtailed by incorporating manure either by direct injection or by tilling within 24 hours after application. For some crops, the incorporation of manure may be combined with preparation for seeding. One factor in reducing NH_3 volatilization from soil is that most agricultural soils have pHs in the range of 6 to 7.5. Ammonia will tend to remain in soil at that pH.

7.2.4.2 Reducing SSAS Transport within a Field

To effectively reduce the transport of SSAS within a field, techniques to minimize runoff, increase infiltration, and trap sediments are used. Similar conservation techniques described for reducing soil detachment may also reduce the within-field transport. The use of cover crops and crop residue will effectively reduce the runoff velocity and trap sediments. The type and extent of cover crop or crop residue will control its effectiveness. Contour farming, strip cropping, and conservation tillage may all effectively reduce within-field transport. Diversion of runoff from up-slope areas may also reduce the runoff on the targeted field.

Cover crops also immobilize nitrogen and phosphorus effectively converting the elements into slower release forms. Along streams, other management practices may be implemented to reduce the potential for eroded material to enter the water. Riparian buffers of trees, grass, and shrubs may reduce transport of material to the stream. They are discussed in more detail in the next section.

Many agricultural areas of the United States require drainage of the soil by tile to be fully productive. In those areas, limiting of the amount of applied nutrients would be the best way to control the movement of nutrients to drainage paths. Areas of the US that have significant karst landforms are also susceptible to significant losses of N and P in drainage water (Stoddard et al., 1998). Some of the soils are quite shallow and may rapidly allow movement of water and dissolved nutrients to streams and lakes

7.2.4.3 Trapping Sediment after the Field

The final point of control is trapping sediment after the field. Though this should effectively reduce the sediment load to a water body, this technique is treating the symptom and not addressing the problem. Efforts should be made to reduce the generation of SSAS, not simply trap or intercept them. Trapping strategies include grassed buffer strips, diversions, detention basins/ponds, riparian buffers, terraces, and wetlands. These solutions generally approach a more engineered solution versus the first two phases of erosion prevention (preventing soil detachment and within-field transport). Efficiencies vary based on design and operation of the control structure (Butler and Karunaratne, 1995). In addition, many of the strategies have multiple functions in the prevention of erosion as shown as in Table 7.1. These strategies are used alone and in combination to address the erosion problem.

Table 7.1 Functions of soil conservation practices (Adapted from USEPA, 2001a).

Conservation Practice	Soil Detachment	Within Field Transport	Sediment Retention
Conservation tillage	X	X	
Contour or Cross-slope Tilling		X	
Contour strip cropping/Contour Buffer strips	X	X	X
Cover crops	X	X	
Crop rotation	X	X	
Diversions		X	X
Field borders		X	
Filter strips		X	X
Grassed waterways	X	X	X
Ponds		X	X
Riparian buffers		X	X
Sediment basins		X	X
Terraces		X	X
Wetlands			X

Depending on topography, waterways on a farm could lead to sediment traps or constructed wetlands that would intercept much of the sediment and nutrient load that leaves the fields. Periodic cleaning of these structures would be necessary to retain capacity.

Riparian zones are areas usually associated with the banks of river or stream corridors and are areas where subsurface flow (groundwater runoff or base flow) reaches either the ground surface or near surface before contributing to stream flow, causing elevated water tables and high soil moisture condition that typically support a variety of vegetation. Riparian zones impart a variety of beneficial influences upon streams such as reducing sediment and nutrient loads, mitigating the severity of flooding, and increasing soil permeability and soil organic content.

In addition to the physical benefits just mentioned, riparian zones may also exert a chemical influence on groundwater runoff, most notably conditions that favor nitrate reduction. The ability to support nitrate reduction is closely tied to the geology and hydrology of a watershed, and the extent of the riparian zone.

If the soils in a riparian zone are saturated, and anaerobic or anoxic conditions exist, nitrate reduction is possible. In addition to the favorable conditions noted, not only must the flow path of groundwater intersect or flow through the riparian zone before discharging to the stream, but also the area where groundwater recharge occurred must be in an area where elevated nitrate levels exist in the soils. In other words, recharge to the groundwater system may occur over a large portion of a watershed or field, but not all of this recharged water will follow a flow path through a riparian zone. Some of the water may move into deep groundwater flow regimes, well below the influence of the riparian zone and into another groundwater system. Some groundwater may appear as spring flow, also bypassing the riparian zone. Still other groundwater may follow a flow path that travels below the riparian zone (rather that laterally through the riparian zone), then vertically upward into the stream minimizing any contact time within the riparian zone.

Seasonal variations also affect the influence of the riparian zone. During wet seasons, the water table may be elevated and intersect the stream creating the favorable conditions for nitrate reduction. During drier periods, the water table may drop, and groundwater runoff that previously would have followed a flow path through the riparian zone will now flow beneath the zone without any reducing effects.

Finally, even if the flow path that groundwater runoff follows is lateral through the riparian zone, only runoff that originates in an area that has elevated nitrate will experience possible nitrate reduction. This becomes important when areas are chosen for the application of animal waste. If the goal is to incorporate the benefits of a riparian zone into the management of animal waste, the waste must be applied in areas where the runoff generated, both surface and subsurface runoff depending on the benefit desired, will flow through the riparian zone.

The two primary nutrients in animal waste behave almost opposite to runoff or precipitation. Phosphorus (P) is primarily transported as particulate P in runoff, although there is an important component of soluble P, whereas nitrate is highly soluble and is more readily leached into the groundwater. As noted previously, this may be a factor in deciding where to place animal waste within a field or watershed. Precipitation events that are insufficient to produce runoff that would carry P to a receiving water body are typically insufficient to mobilize sediments. Finally, even if the flow path that groundwater runoff follows is lateral through the riparian zone, only runoff that originates in an area that has elevated nitrate will experience possible nitrate reduction.

7.3 Composting of CAFO wastes

Composting of CAFO and AFO wastes benefits the environment because nutrients contained in manure, livestock carcasses, and other materials are converted to stable forms in the compost. Therefore, these nutrients are less likely to leach into groundwater or to be carried off with surface runoff. In addition, the total mass of material is reduced in the composting process. Compost may be easily stored until conditions are favorable for land application and therefore possibly minimizing the impact to environmentally sensitive areas. Another advantage of composting is that due to high self- heating (55-65°C), the process is generally self-pasteurizing for most pathogens, provided that the minimum time and temperature conditions have been met. The main concerns of composting these types of wastes are pathogen control, nitrogen volatilization and leaching, excess available phosphorus, and economic viability of composting depending on type of system required.

7.3.1 What is Composting?

Composting is a useful tool in waste management because it may rapidly transform putrescible material to a stabilized product that may be stored, transported, and used as a soil conditioner/fertilizer (May nard 1993). In composting, a solid-phase organic material such as manure mixed with a bulking agent (corn cobs, corn stover, straw, wood chips) serves several functions. The solid organic phase is a physical support for microorganisms, maintains pore space for gas exchange, is a source of organic and inorganic nutrients, contains diverse indigenous microbes, and provides thermal insulation. Water may be added to maintain the proper moisture content of the compost. The major form of microbial metabolism is aerobic respiration. The heat generated during the exothermic reactions of metabolism becomes trapped within the matrix causing self-heating, which is characteristic of the composting process. The critical elements of successful composting are a proper carbon to nitrogen ratio (15-40 to 1), adequate oxygen supply, temperature control, maintenance of moisture, and provision of an adequate time period to reduce pathogens to appropriate levels. All composting systems may be described by their means of regulating the initial oxygen supply and maximum temperature (Finstein and Hogan 1993). For a more in-depth review of all the possible composting configurations based on oxygen supply and maximum temperature, along with a brief discussion of whether that type of system is currently practiced and, if practiced, how the technology is faring, see Finstein and Hogan (1993). For a review of the composting process parameters for animal wastes or other organic wastes, see the following references: Agriculture Waste Management field

handbook by the U.S. Dept. of Agriculture and On-farm composting handbook by NRAES-54 (Dougherty 1999, Rynk 1992.

7.3.2 Composting systems

In order to avoid a long and lengthy list of composting systems in practice and vendor specification to define composting systems, the basic outlook of man over mechanical intervention required to compost will be discussed in order to save space. The current practices and system types utilized by poultry, cattle/dairy, and swine will be discussed later. There are basically two types of composting systems, interventionary and non-interventionary (Stentiford 1993).

7.3.2.1 Interventionary Systems

Interventionary systems are systems that require mixing as an aeration process, and these systems may also have some form of supplementary aeration. These systems may take many forms such as windrows, agitated bays, stirred vessels, and multi towers. The main advantage with interventionary systems is that mixing of the waste prior to composting is not as critical as it is in non-interventionary systems. These systems are better suited for the composting of putrescible wastes because they allow the composter to adjust parameters, such as moisture and amount of bulking agent, while the composting process is ongoing.

7.3.2.2 Non-Interventionary Systems

In non-interventionary systems, the initial conditions of the feed material are critical for successful operation. Non-interventionary systems consist primarily of aerated static piles and silo systems. The silo system was not proven to be an effective method of composting due to aeration and moisture control problems inherent with the system design. The aerated static pile has proven effective with composting many wastes, but it must be emphasized that this system is not dynamic. The system must be carefully constructed in order to provide uniform heating and moisture throughout the process since no other intervention will occur. This means that the risks of composting failure to achieve the desired results of pathogen destruction and nutrient stabilization are higher with this type of system (Lufkin 1996, Mathur 1990, Sartaj 1997).

7.3.3 Comparison of Interventionary and Non-interventionary Systems

Each type of system has its merits and associated cost. The interventionary systems offer the operator improved control, shorter processing time, and reduced land use, but with these advantages comes increased price of setup and operation. The non-interventionary systems offer the operator low setup and operational costs but requires increased land usage, increase in the time required for stabilization, and little or no control of the process (Stentiford 1993, Sartaj 1997, Vuorinen 1999-1997). Therefore, the type of process utilized to compost the CAFO and AFO waste streams must take into consideration the time frame, costs, distance to population centers, and the systems' ability to meet final regulatory requirements.

7.3.4 Composting in the Beef and Dairy Industries

7.3.4.1 Beef

Since manure from the beef cattle occupying range and pastureland is dispersed by the animals, composting in the beef cattle industry is limited to manure generated at feedlots (Kashmanian 1996). Composting is generally performed by the feedlot owners or sub-contractor at the facility. The windrow method of composting is the most commonly practiced method (Lufkin 1996, Rynk 1992, Mathur 1990).

The manure may be composted alone or by mixing the manure with locally available carbonaceous feedstocks, such as straw, newspaper, or yard trimmings. The additional carbon sources help in raising the C/N ratio and reduce the loss of nitrogen as a result of ammonia volatilization (Hong 1997, Larney 1999). The handling of the material is usually performed by either a front-end loader or a windrow turning machine. The final compost is either sold commercially for landscape and gardening or sold in bulk for crop production.

7.3.4.2 Dairy

The sources of manure readily compostable from the dairy industry are the bedding materials used in barns and partially dried manure from the open lots. Another source of material found in the dairy industry is manure solids separated from liquid collection systems. Dairy wastes from bedding and open lots may be composted as is, but the composting process benefits from the addition of high carbon substrates in order to minimize nitrogen loss due to volatilization (Hong 1983, Hong 1997). As with beef cattle, the method of composting applied by dairy farmers is windrows. The windrows are either static or forced aeration with turning methods as described above. The forced aeration systems are generally used by larger facilities that do not have the land or storage ability to deal with nutrient management issues due to the high manure load (Joshua 1998, Fernandes 1997). Some composting at dairies is performed by outside organizations and sold to commercial outlets. The dairy industry has recently adopted some practices that do not favor composting as a waste management practice. These practices are the use of bedding mats or sand in free stall areas, and many larger farms are switching over to liquid manure handling systems. The liquid systems increase the cost associated with dewatering solids and increase the amount of carbonaceous materials needed to compost. Another disadvantage of these practices is the increased moisture present at the initiation of composting requires that the compost must be turned more frequently until the moisture level becomes more favorable (40-50%). If the moisture level remains too high then the composting system has a tendency to become anaerobic which leads to the production of foul odors (Kashmanian 1996).

7.3.4.3 Composting Swine Waste

Due to the wet nature of swine waste and the current practices of water waste collection the swine industry is the least suited for composting. A small number of operations raise swine in a deep bedding method in which the waste is absorbed by straw or sawdust. After the swine are raised, this bedding material may then be composted by any number of means (Hong 1998, Lau 1993, Peterson 1998, Tiquia1997-98). Most other systems use a liquid method for waste collection, and, therefore, the solids need to be removed from the waste stream in order to compost. The separation may be performed by several methods (centrifugation, screening, and presses) but all methods add to the cost and handling of the waste (Liao 1993, Kashmanian 1996). Due to the wet nature and the high nitrogen content of the swine manure, a readily available source of high carbon bulking materials would be necessary in order to compost this material. One area of composting that is gaining attraction in the swine industry is the composting of mortalities. This is a relatively inexpensive way to deal with mortalities since the cost of rendering and number of rendering facilities across the country is declining. Only a limited number of states allow this form of composting and the accepted methods vary slightly from state to state. The pathogens associated with the swine industry *(Salmonella typhimurium, Streptococcus suis, Bordetella bronchiseptica, Listeria monocytogenes, Actinobacillus suis, and Actinobacillus pleuropneumoniae*) have been shown to be sufficiently killed by the high temperatures of the composting process (Morrow 1995). The composting of mortalities is limited to normal fatalities and is not an acceptable method for the disposal of a large number of animals due to a system failure.

7.3.4.4 Composting Poultry Waste

Poultry manure is readily compostable due to the method of raising animals in confined areas and the dry nature of the material. This manure generally requires the addition of carbonaceous materials due to its high nitrogen content (Figures 7.3-7.4). Water must also be added to poultry manure and/or litter to ensure proper initial composting conditions (Flynn 1996, Hansen 1990, Spencer 1997). One of the advantages of composting to the poultry industry is the relative small land size of poultry operations, and, therefore, they do not have adequate land for application of raw manure. Composting allows the poultry producer to stabilize a waste product on a small area while creating a potential value added product. Commercial outlets for the finished material are one solution that several producers have utilized (Lufkin 1996). Most poultry operations practice composting of mortalities since it is an environmentally acceptable practice and other forms of disposal are facing increased restriction and increased cost (Kashmanian 1996). National standards for the practice of poultry mortality composting are published by the U.S. Dept. of Agriculture's National Resource Conservation Service. Many state and national guidelines are available on the web for the composting of poultry mortalities.

Photo courtesy of USDA NRCS.

Figure 7.3. Mixed compost from turkey waste.

Photo courtesy of USDA NRCS.

Figure 7.4. Turkey waste compost with wood chips and feathers.

7.3.5 Composting Concerns and Problems

The type of manure handling practice has a large impact on whether a particular farm is going to compost or not. Composting is generally practiced on farms that handle their manure in a solid or near-solid consistency. Composting is rare on farms that utilize liquid techniques for manure handling, such as swine and dairy operations. There are some exceptions because of solids separations techniques, but these add cost to the final operation and may therefore be impractical in some operations (Liao 1993). In order to address the high moisture and high nitrogen content of the waste, a locally available source of carbonaceous materials must also be readily available (Dougherty 1999, Rynk 1992, Hong 1983). The volatilization of NH_3 is a major concern in the composting of manures because it lowers the fertilizer value of the finished compost and produces environmental air quality issues.

7.3.5.1 Nutrients.

There has been some study of the effect of C/N ratio on the volatilization of NH_3 from poultry and sewage sludge composting operations (Hansen 1990, Hong 1997, Kirchmann 1989, Larney 1999, Lopez-Real 1996). In order to minimize the loss of NH_3, a higher C/N ratio is more favorable. The use of either a soil or carbon source cover has also been shown to minimize ammonia volatilization (Hansen 1990). Another factor that seemed to help in the retention of nitrogen during composting is the recycling of compost back into the initial feed material. This practice, though, is generally only used to inoculate the composting system, since it reduces the overall mass loss and requires additional handling of the same material (Larney 1999, Hansen 1990). No information was found on the nitrogen content of potential leachate from composting materials.

7.3.5.2 Pathogens

Pathogens associated with these waste streams fall into two categories, primary and secondary pathogens. The primary pathogens consist of bacteria, viruses, protozoa, and helminths. When the

composting process is run correctly, it is very efficient at destroying primary pathogens, and exposure-related infectious disease from primary pathogens among compost workers has not been documented. (Epstein 1993, Bertoldi 1988). To be effective at pathogen removal the composting process must attain a temperature greater than 55°C for more than three consecutive days (Choi 1999, Rynk 1992, Bertoldi 1988). Although there are no federal regulations for the composting of manures, the US EPA addresses pathogen reduction guidelines, which may be applied to manure, for the composting of biosolids in the September 1989 report entitled "Environmental Regulations and Technology: Control of Pathogens in Municipal Wastewater Sludge," EPA/625/10-89/006, p21, To be considered a PFRP, the composting operation must meet certain operating conditions. These regulatory conditions are specific to the method of composting practice. For windrow composting, the sludge must attain a temperature of 55°C (131°F) or greater for at least 15 days during the composting period. In addition, during the high-temperature period, the windrow must be turned at least five times. If the static aerated pile or the within-vessel method is used, the sludge must be maintained at operating temperatures of 55°C (131°F) or greater for 3 days. This temperature requirement is effective at removing most, if not all pathogens. The removal of *Salmonella* and other pathogens during the compost process has been demonstrated for a variety of animal wastes. Lawson (1999) showed the removal of pathogens during the composting of poultry carcasses and litter. Lung et al., 2001, demonstrated the removal of *Salmonella* and *E. coli* O157:H7 during the composting of cow manure. This study showed no removal of either pathogen in reactors held at room temperature. Tiquia et al., (1998) in a study of pig litter composting *Salmonella* was reduced from 1700 per gram to below detection limit and a greatly reduced (not specified) population of fecal coliforms and streptococci. The fecal coliforms and streptococcal numbers were below the amount found in commercially available potting mixes. The only primary pathogen of concern is the possible regrowth of *Salmonella* by reinoculation of unfinished compost (Burge 1987, Russ 1981, Tiquia 1998). Other pathogens are not addressed in recent literature. This has been shown to be a possible problem from the composting of biosolids/sewage sludge and therefore could also be a potential problem in the composting of manures (Burge 1987). There has been some study of the suppression and regrowth of *Salmonella* in composts at different ages of material by Sidhu, 2001. In this study, *Salmonella* was inoculated into sterilized and regular composts of various ages. *Salmonella* regrowth was similar in all sterilized composts, with terminal populations of about 100 per gram. The growth of *Salmonella* was suppressed in all non-sterilized composts regardless of the age of the material. The suppression ability of the compost showed a slight decline with time, and, therefore, more study is needed to look at the effect of long term storage and regrowth of pathogens. Good composting practices that avoid cross contamination of raw and finished product alleviates this problem. Storage of compost for 30 days after the active phase of composting has been shown by Gibbs, 1998, to reduce the number of *Giardia* cysts to below detection limits (<10 cysts/gram).

"Secondary pathogens" fungi and other microorganisms produced during the composting process are of concern. The largest health threat seems to come from a secondary pathogen, the heat tolerant fungus *Aspergillus fumigatus*, and several related fungi, which cause "aspergillosis" (also known as "farmer's lung" or "brown lung" disease). This fungus, a well-known product of silage, manure compost, and wastewater sludge compost, grows well on decaying vegetable matter at temperatures above 45°C, and thus survives most of the composting process. Infections in susceptible individuals (including those on immuno-suppressant drugs, antibiotics, adrenal corticosteroids, or with pulmonary disease, asthma, and certain other infections) may be severely debilitating and even fatal. Such infection appears related to high levels of "infective units" in dusts, perhaps reflecting interaction with other materials as irritants, because the organism itself is ubiquitous and not regarded as an off-site or product-related problem (Epstein 1993).

7.3.6 Land Application of Compost

The land application of composted manure has been shown to minimize nitrate leaching into the ground waters (Figure 7.5). The amount of nitrate leached in reported studies was lower from compost-amended plots when compared to conventional fertilizer or direct manure application (Dalzell 1987, Grey 1999). In a study of groundwater by Maynard, 1993, when compost was applied at rates to supply all nitrogen requirements, the compost-amended soils had < 10 mg/kg of nitrate as compared to >14.7 mg/kg for conventional fertilizer application. In a reclamation study of forest soils by Insam, 1997, using various composted and non-composted soil amendments, the nitrate levels below the compost plots were only increased a small amount, whereas the non-compost plots had a highly elevated level of nitrate present in the ground water (<150 mg/L). A three year agricultural study by Diez (1997), which compared compost-amended fields to controls and fields with chemical fertilizers under two different irrigation systems, had mixed results. Under an efficient irrigation system, the compost and control fields had similar low levels of nitrate in the ground water, but under conventional irrigation practices (field flooding in Spain) the compost and chemical fertilizer treated plots had similar nitrate levels. Jakobsen, 1996, performed a pot study looking at the effects of compost-amended soil on mineral availability, soil conditions, and nitrate availability after compost application and after additional fertilizer application. There was some nitrate leaching during winter months from the compost-amended soils after chemical fertilizer was applied but the amount was significantly less than the non-amended control soils. Jakobsen's study also concluded that if compost is applied at a rate to supply the phosphorus needs of the crop, the soil's pH was raised, the cation exchange capacity was maintained, and the soil structure was improved even after a crop had been raised. Another indicator of the stability of nutrients in compost is the agronomic value for estimating availability of nutrients from compost. Values for the availability of nitrogen range from 7 to 25 percent, whereas phosphorus is 100 percent, and potassium is 80 percent for the first year (Grey 1999, Tester 1990, Larney 1999).

7.4 A Strategy Requiring Some Additional Research– Anaerobic Digestion

7.4.1 Technology Description

Anaerobic digestion may be defined as the biodegradation of organic materials in the absence of oxygen. This treatment is particularly appropriate for manure with a high organic (BOD) content. The resulting product is deodorized, has a substantially lower organic load, and has greater nutrient availability (N and P) for crops. The process converts dissolved and particulate matter into a gas, which is primarily composed of methane and carbon dioxide, via a series of interrelated microbial metabolisms (Magbanua, et. al, 2000).

Although different types of anaerobic digester designs exist, only covered lagoons, complete-mix digesters, and plug-flow digesters may be considered commercially available because they are the only ones that have been implemented successfully at ten or more sites (U.S. EPA, 2001).

7.4.1.1 Covered Lagoons

For agricultural waste, anaerobic lagoons are the most common and simplest anaerobic digestion treatment systems (Copeland et. al, 1998; McNeil Technologies, 2000). A covered lagoon digester typically consists of an anaerobic combined storage and treatment lagoon, an anaerobic lagoon cover, an evaporative

Photo courtesy of USDA NRCS.

Figure 7.5. Truck mounted spreader applying compost to a field.

pond for the digester effluent, and a gas treatment and/or energy conversion system. Following treatment, the digester effluent is often transferred to an evaporative pond or to a storage lagoon prior to land application (McNeil Technologies, 2000).

The advantages of covered anaerobic lagoons are the reduction of lagoon odor, exclusion of rainfall from the lagoon, recovery of usable energy, reduction of ammonia volatilization, and reduction of methane emissions. There are also significant labor savings involved in handling manure as a liquid and being able to apply lagoon waters to the land through irrigation (U.S. EPA, 2001c). The limitations of covered anaerobic lagoons include the cost of installing a cover, or the occasional need for cover maintenance such as rip repair and rainfall pump-off. Spills and leaks to surface and ground water may occur if the lagoon capacity is exceeded, or if structural damage occurs to berms, seals, or liners (U.S. EPA, 2001c).

7.4.1.2 Complete Mix Digester

A complete-mix digester is a biological treatment unit that anaerobically decomposes organic waste using controlled temperature, constant volume, and mixing. These digesters may accommodate the widest variety of wastes and are generally used to treat waste with 3 to 10% total solids and adequate volatile solids to produce enough methane to maintain digester temperature (Moser, 2000a,b). The digesters are usually above ground, heated, insulated, round tanks; however, the complete-mix design has also been adapted to function in a heated, mixed, covered earthen basin. Mixing may be accomplished with gas recirculation, mechanical propellers, or liquid circulation. Like covered lagoon systems, digester effluent from complete mix digesters is frequently stored in evaporative ponds. The outflow is recycled onto cropland.

7.4.1.3 Plug-flow Digester

A plug-flow digester is a heated, unmixed, rectangular tank. New waste is pumped into one end of the digester, thereby displacing an equal portion of older material horizontally through the digester and pushing the oldest material out through the opposite end (Moser, 2000a,b). The tank is usually built in the ground and is long and slim and the ratio of the length to the width should be between 3.5:1 and 5:1 (U.S. EPA, 2001c). The outflow may go into an outside storage pond to be held until the manure is recycled onto cropland (Goodrich, 2001).

Overall, some advantages of anaerobic digestion include the opportunity to reduce energy bills, produce a stabilized manure, recover a salable digested solid by-product, reduce odor and fly breeding, and produce a protein-rich feed from the digested slurry (U.S. EPA, 2001). However, the costs of installing an anaerobic digester that collects the biogas may be quite high. Therefore, their economic viability is often dependent on the price at which the excess energy may be sold to a local electrical utility (Prairie Agricultural Machinery Institute, 1997).

7.4.2 Application

Anaerobic digesters are, possibly, the most trouble free, low maintenance systems available for the treatment of animal waste. Farm-based manure facilities are perhaps the most common use of anaerobic digestion technology (Lusk, 1998). Properly designed anaerobic lagoons are used to produce biogas from dilute wastes with less than 2 percent total solids, including flushed dairy manure, dairy parlor wash water, and flushed hog manure. Complete-mix digesters may be used to decompose animal manures with 3 to 10 percent total solids. Plug-flow digesters are used to digest thick wastes (11 to 13 percent solids) from ruminant animals, including dairy and beef animals (U.S. EPA, 2001).

Anaerobic digestion is one of the few manure treatment options that reduce the environmental impact of manure and produce a commodity – energy – that can be used or sold continuously. It is more extensively used outside of the United States where treatment of animal waste has been a concern for a longer time (Moser, 2000a,b).

U.S. livestock operations currently use four types of anaerobic digester technology: slurry, plug-flow, complete-mix, and covered lagoons. As of 1998, 28 digester systems are in operation at commercial swine, dairy, and caged-layer farms in the United States. Table 7.2 provides a numerical status report of farm-based anaerobic digesters in the United States. The data excludes 65-70 digesters that were installed on or were planned for beef farms, and digesters that are primarily university research oriented (Lusk, 1998).

Table 7.2. Status of Farm-Based Digesters in the United States

Type	Slurry	Plug	Mix	Lagoon	Other	Total
Operating	7	8	6	7	0	28
Not operating	0	18	10	1	0	29
Farm closed	0	11	5	1	0	17
Under construction/planning phase	0	2	4	0	4	10
Planned but never built	0	8	1	1	0	10
Total	7	47	26	10	4	94

During the 1990s, 18 systems were installed – more than doubling the number of successful systems installed during prior years. In 23 of the 31 systems, the captured biogas is used to generate electrical power and heat (U.S. EPA, 2001).

Because of the differences in the manure produced from different animals, a system to make methane from dairy cow manure is quite different from a digester for manure from swine. For dairy cows, a plug-flow digester system works well for collecting and breaking down manure and capturing the gas produced from this process. A completely mixed digester is better for swine manure (Goodrich, 2001).

Beyond their ability to manufacture biogas, digester designs based on use of thicker manures may offer the most benefits of the systems evaluated to date. Plug-flow digestion and its slurry cousin are economically sensitive to co-product use and other offsets from current manure management practices, but they are less expensive and technically easier to operate and maintain than a comparable complete-mix digester. Covered lagoon digesters appear to have economic merit for the large number of swine and dairy operations in the Southeast and West. Complete-mix digesters generally have higher capital costs and operating and maintenance requirements than slurry-based, plug-flow, and covered lagoon digesters. This will generally limit complete-mix digester applications to very large farms or centralized facilities, or to farms having waste streams with total solid concentrations too low for slurry and plug-flow digestion and to locations where the climate is too cold to economically justify covering an anaerobic lagoon (Lusk, 1998).

7.4.3 Operation and Performance

The successful operation of a properly designed anaerobic digester is dependent upon two variables, feed rate and temperature. All other operational issues are related to ancillary equipment maintenance. At face value, the performance data are not encouraging to a farmer considering whether to install an anaerobic digester as a waste treatment option. Overall, the chance for failure is approximately 50% in the United States (Lusk, 1998). Among the types of farm-based digesters actually built, the failure rates for complete-mix and plug-flow systems are staggering: 70% and 63%, respectively. For covered lagoon digesters, the failure rate is 22% (Lusk, 1998). However, a properly designed, constructed, and operated anaerobic digester is a low maintenance system that is very forgiving and not likely to create emergency situations that can be experienced with many alternative waste management systems (Saele). The failures of lagoons and the resulting waste spills have brought much of the recent critical attention to animal agriculture, and some have called for phasing out lagoons (Copeland, 1998).

Historically, one of the major problems with anaerobic digestion has been its unreliability. Because of the complex association of different types of bacteria, anaerobic digesters are prone to problems and have a higher risk of breakdown than other systems. The process is also more difficult to control (Cord-Ruwisch, 2001).

A review of anaerobic digestion project case studies revealed that the most common reasons for system failures include poor design and installation and poor equipment specification. Poor equipment and materials selection are also common reasons for failure. Other reasons that explain the failure of some anaerobic digestion projects include: insufficient gas production due to build-up from straw and foam, an inability to heat the digester to the desired level, insufficient insulation and agitation, grit deposition, engine corrosion, inadequate screening and sedimentation process, engine overheating, valve and pump problems, and maintenance costs (Lusk, 1998).

The improved reliability of newer systems and increased understanding of the biological systems that operate in an anaerobic digester suggest that the reliability of systems will continue to improve as long as lessons of past system failures are heeded (Lusk, 1998).

In spite of the chances of failure, survey farmers who have installed and continue to operate digesters are generally satisfied with their investment decisions. Some chose to install digesters for non-economic reasons, primarily to control odor or contain excess nutrient runoff. Farmers have found that the returns provided from electricity and co-product sales from the digester, however limited, are preferred to the sunk-cost of conventional disposal that provides zero return on investment. Moreover, without the environmental benefits provided by anaerobic digestion technology, some might have been forced out of livestock production (Lusk, 1998).

The anaerobic digestion process must be evaluated and implemented at each site. As a result, few meaningful generalizations may be made. Factors required for successful project implementation include: an adequate match of digester type to the farm's manure management program, competent design and installation, which simplify digester operation and maintenance, maximization of co-product use to enhance economic performance, and overall, an accommodating farm management and its willingness to incorporate the uncertainties of a new technology (Lusk, 1998).

7.4.4 Fuel Gas Production

Anaerobic digestion is the only waste management strategy available that provides the option to recover methane for energy production (McNeil Technologies, 2000). According to the USEPA AGSTAR Industry Directory for On-Farm Biogas Recovery systems, there are currently 89 agricultural methane recovery sites operating in the United States. A majority of the units are situated in the eastern region of the country. The digester technologies used to collect biogas from swine facilities include covered anaerobic lagoons, complete mix digesters, plug flow reactors, induced blanket reactors, and sequencing batch reactors. Although a sequencing batch reactor has been used for anaerobic digestion at one swine facility in the United States, this technology is considered to be experimental (McNeil Technologies, 2000).

Daily biogas production at installed farm-based anaerobic digesters in the United States varies from 24,000 to 75,000 cubic feet, or an energy equivalent of 13 to 42 million British thermal units (assuming 55 percent methane content for biogas). Approximately 35 percent of the volatile solids from dairy manure and 60 percent from swine or beef manure may be converted to biogas and removed from the manure liquid (U.S. EPA). The induced blanket reactor has achieved 80 % reduction of volatile solids.

Covered lagoon digesters and complete mix digesters differ in their methane production characteristics, and energy conversion systems that rely on methane from anaerobic digesters should be chosen according to the end-use objective for the system. Complete mix digesters may produce heat and electricity at a constant rate throughout the year because heat recovery may be used to heat the digesters in the winter. Covered lagoon digesters may consistently produce biogas only in months when the temperature exceeds 39 °F (Figure 7.6). Reactors may be successful in the northern United States if careful attention is paid to heat management. The facilities that are located in the southern portion of the country are usually warm enough for cost-effective energy recovery from covered lagoon digesters. Complete mix digesters may be used in cold or warm climates. If odor control is the only objective, either covered lagoon or complete mix digesters may be used, but odor control will be less effective in the winter for covered lagoon digesters in the south (McNeil Technologies, 2000).

Photo courtesy of USDA NRCS.

Figure 7.6. Covered manure tank generating methane in Iowa.

A review of recent dairy waste anaerobic digestion studies has established that most engineers anticipate a 50 percent conversion of volatile solids to gas. The planned Three-Mile Farm (Oregon) dairy waste thermophilic anaerobic digestion facility is expected to achieve a 50 percent volatile solids conversion to gas. The C. Bar M. (Idaho) plug flow anaerobic digester facility anticipated a 50 percent conversion of dairy waste volatile solids to gas. The recently completed Myrtle Point (Oregon) feasibility study utilizing the *gravity separation contact process* anticipated a 50 percent conversion of dairy waste volatile solids to gas. Relatively high loading rates were anticipated in each case. The organic loading rates varied between 5.6 and 6.4 $kg/m^3/d$ (Burke, 2001).

7.5 Technologies Requiring Significant Additional Research Before Implementation-Aerobic Digestion-Wetlands-Land Reclamation

7.5.1 Aerobic Digestion

The use of aerobic digestion to treat livestock wastes was born out of a need to reduce the pollution of both surface and ground water supplies, which had been caused by the spreading of manures, and the unavailability of land during much of the year for immediate spreading of animal wastes. For these reasons, farmers began to look for a low-cost, manure storage method that would not give rise to intolerable odors and insect breeding (U.S. EPA, 1972).

One of the simplest methods of low odor waste treatment is the aerobic biological treatment process. Aerobic treatment for the removal of biodegradable organic matter from liquid wastes is an odorless process and consists of two phases operating simultaneously. One phase is biological oxidation that has by-products such as carbon dioxide and water. The second phase utilizes the energy from the oxidation phase for synthesis of new cells (U.S. EPA, 1972). The degree of oxidation depends on the amount of oxygen

provided, the reaction time allowed in the treatment process, and temperature. The relatively strong oxidizing environment leads to a more extensive breakdown of organic compounds, with water, carbon dioxide, nitrates, sulfates, and other simple molecules being the products (Bicudo, 2001). With conventional aerobic digestion, substantial reductions in total and volatile solids, biochemical and chemical oxygen demand, and organic N may be realized.

An aeration basin typically is used for the aerobic digestion of municipal and industrial wastewater biosolids. In contrast, several reactor types, including oxidation ditches and mechanically aerated lagoons, as well as aeration basins, have been used for the aerobic digestion of animal manures. Under commercial conditions, the oxidation ditch has been the most commonly used because it may be located in the animal housing unit under cages for laying hens or under slatted floors for swine (U.S. EPA, 2001).

7.5.1.1 Types of Aerobic Digestion Technologies

7.5.1.1.1 Oxidation Ponds

The oxidation pond (naturally aerated lagoon) is a shallow pond that uses a natural system of evaporation as a means of effluent reduction. In an aerobic lagoon or oxidation pond, there must be an abundance of dissolved oxygen available in the water for the aerobic bacterial and other organisms to interact in the biochemical process that decomposes or breaks down the organic materials in the liquid waste. Normally, aerobic lagoons range from 3 to 5 feet deep. If oxidation ponds are properly constructed and hold the wastes for a sufficient time, a good destruction of coliform organisms and a satisfactory reduction of BOD_5 occur. The effluent is usually high in dissolved oxygen (U.S. EPA, 1972). The main advantages of aerated lagoons are that aerobic digestion tends to be more complete and it produces fewer odors than anaerobic digestion (McNeil Technologies, 2000).

Because of the large surface area required, oxidation ponds have not found favor with livestock producers. Vast amounts of land are required – as much as 25 times more surface area and 10 times more volume than an anaerobic lagoon 10 feet deep. Thus, naturally aerobic lagoons are impractical for primary oxidation and are generally not recommended for treatment of livestock production wastes (Barker, 1996). Their use has been essentially limited to receiving effluent from anaerobic lagoons and other treatment units.

7.5.1.1.2 Mechanically Aerated Lagoons

A mechanically aerated lagoon is similar to a stabilization pond except that it is equipped with one or more electrically powered aerators that treat effluent by mixing it with air (Water for the World). Mechanically aerated lagoons combine the odor control advantages of aerobic digestion with relatively small surface requirements. Aerators are used mainly to control odors in sensitive areas and for nitrogen removal at limited land disposal sites (Barker, 1996). A major disadvantage of mechanically aerated lagoons is the expense of continually operating electrically powered aerators. Larger anaerobic lagoons may provide similar performance with less expense (Barker, 1996).

7.5.1.2 Application

Conventional aerobic digestion is a process used frequently at small municipal and industrial wastewater treatment plants for biosolids stabilization. Conventional aerobic digestion is an option for all swine and poultry operations where manure is handled as a liquid or slurry. With proper process design and operation, a 75 to 85 % reduction in BOD_5 appears achievable, with a concurrent 45 to 55 % reduction in

COD, and a 20 to 40 % reduction in total solids. In addition, a 70 to 80 % reduction of the N in both poultry and swine wastes via nitrification-denitrification also appears possible. Total P is not reduced, but the soluble fraction may increase (U.S. EPA, 2001).

Unlike anaerobic digestion, aerobic digestion has not been adapted to any significant degree by the poultry, dairy, or swine industries, although a number of research and demonstration scale studies were conducted in the late 1960s and early 1970s. Problems related to process and facilities design, together with the significant increase in electricity costs in the early to mid-1970s, led to a loss of interest in this animal waste treatment alternative. It is possible that no aerobic digestion systems for animal wastes are currently in operation in the poultry and swine industries.

7.5.2 Wetlands

7.5.2.1 Constructed Wetlands

Constructed wetlands (or treatment wetlands) are man-made, shallow ponds or channels that have been planted with emergent aquatic plants, and are designed, built and operated specifically for wastewater treatment. They rely upon natural microbial, biological, physical, and chemical processes to treat wastewater. To allow optimum process control, water control structures such as gates, valves and dikes have been engineered to control the flow direction, hydraulic retention time, and water level. They are typically constructed with uniform depths and regular shapes near the source of the wastewater and often in upland areas where no wetlands have historically existed. Constructed wetlands are regulated as wastewater treatment facilities and may not be used for compensatory mitigation (USEPA, 2000b).

7.5.2.2 Restored Wetlands

Created or restored wetlands are designed, built (or restored), and operated primarily for wildlife habitat and should not be confused with constructed wetlands. In an effort to mimic natural wetlands, habitat wetlands often have a combination of features such as varying water depths, open water and dense vegetation zones, vegetation types ranging from submerged aquatic plants to shrubs and trees, nesting islands, and irregular shorelines. They are frequently built in or near places that have historically had wetlands and are often built as compensatory mitigation. Created and restored wetlands are generally inappropriate for CAFO applications and are not discussed further.

7.5.2.3 Enhancement Wetlands

Enhancement wetlands are constructed wetlands providing polishing (advanced or tertiary treatment) of wastewater that has been extensively pre-treated, usually to secondary treatment standards. They are often designed, built, and operated for both wastewater treatment and other functions, such as wildlife habitat, outdoor classrooms, or recreational areas. While there may be applications for enhancement wetlands as a tertiary treatment process in certain circumstances, they are generally inappropriate for CAFO applications and are not discussed further.

7.5.2.4 Free Water Surface (FWS) Wetlands

Constructed wetlands have been classified in the literature and by practitioners into two types. Free water surface (FWS) wetlands, also known as surface flow (SF) wetlands, resemble natural wetlands in appearance because they contain aquatic plants that are rooted in a soil layer on the bottom of the wetland, and water flows through the leaves and stems of plants (Figure 7.7).

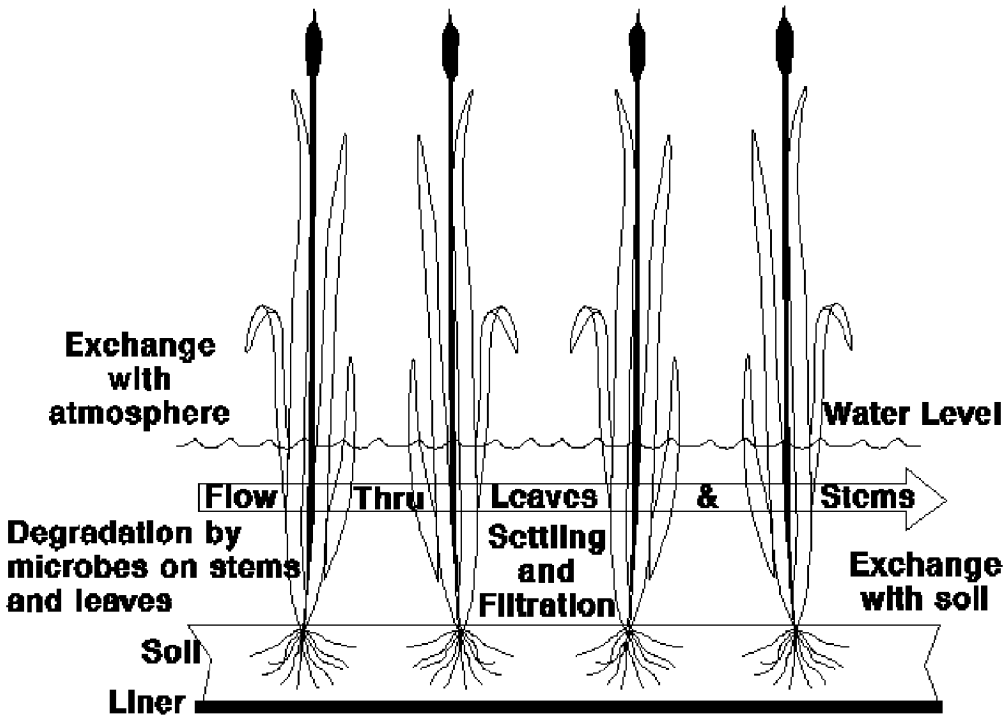

Figure 7.7. Free Water Surface (FWS) Wetland.

7.5.2.5 Vegetated Submerged Bed (VSB) Wetlands

Vegetated submerged bed (VSB) systems, also known as subsurface flow (SSF) wetlands, do not resemble natural wetlands because they have no standing water (Figure 7.8). They contain beds of media such as crushed rock, small stones, gravel, sand, or soil that has been planted with aquatic plants. When properly designed and operated, wastewater stays beneath the surface of the media, flows in contact with the roots and rhizomes of the plants, and is not visible or available to wildlife.

7.5.2.6 Reciprocating (ReCip) wetlands and vertical-flow (VF) wetlands

Reciprocating (ReCip) wetlands and vertical-flow (VF) wetlands are modifications of the VSB process. ReCip wetlands reciprocate flow back and forth between two VSBs in parallel in a way that allows the VSBs to alternate between saturated (anaerobic) and unsaturated (aerobic) conditions (Behrends, et al., 1996). VF wetlands are similar in design and operation to typical vertical flow, intermittent or recirculating sand or gravel filters, which have been planted with aquatic plants.

7.5.3 Treatment Mechanisms

The primary pollutant removal mechanisms for BOD_5 and solids (TSS) are physical removal and biodegradation. Physical mechanisms include impingement on plant or media surfaces, entrapment in plant parts or media, and sedimentation. All of these mechanisms are enhanced by the tortuous flow paths and quiescent hydraulic conditions found in wetlands. Once materials are removed from the water column by physical mechanisms, biodegradation occurs. Obligate and facultative anaerobic conditions predominate in VSBs and FWS wetlands, while the operating characteristics of ReCip and VF wetlands promote alternating anaerobic and aerobic conditions.

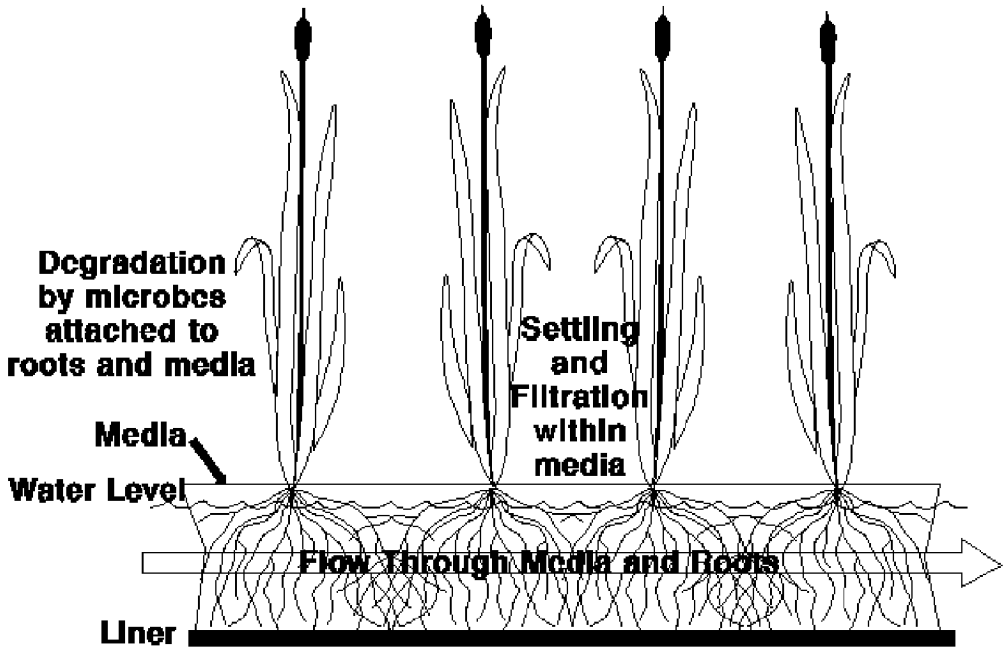

Figure 7.8. Vegetated Submerged Bed (VSB) Wetland.

For CAFO wastewaters (high BOD_5 and ammonia concentrations) in VSBs and FWS wetlands (shallow depths and large surface areas), ammonia volatilization may be a significant removal mechanism for nitrogen, especially in warmer climates. Wastewater lagoon studies indicate that nitrogen losses up to 95% may occur under ideal conditions, with ammonia volatilization being the dominant mechanism (Reed, et al., 1995). However, research is needed to verify this mechanism in constructed wetlands. Microbial nitrification/denitrification as a nitrogen removal mechanism in VSBs and FWS wetlands is less likely, because of the predominance of anaerobic conditions. Nitrification of ammonia is unlikely to occur in VSBs and will occur in the FWS wetlands only if adequate open water zones are incorporated into the design (USEPA, 2000a).

Phosphorus removal in all types of constructed wetlands is primarily limited to adsorption to solids. The adsorbing solids may be material in the influent wastewater, which has been removed from the water column, plant detritus, or the soil or media in the wetland. All of these materials have a finite adsorption capacity, so phosphorus removal may occur for a time when a constructed wetland begins operation, but removal will decrease or stop as adsorption sites are filled. Long term phosphorus removal will be limited to phosphorus that adsorbs to new material entering the wetland that is buried before the phosphorus may be released back into the water column (Kadlec and Knight, 1996). Because new regulations will likely make phosphorus the limiting factor for land application of wastewater (USEPA, 2001), an additional unit process to remove phosphorus will be required.

7.5.4 Plant Functions

The role of aquatic plants in the treatment process is still not clearly understood but appears to be limited primarily to providing an attachment surface for microbes in FWS wetlands. While emergent

aquatic plants may provide oxygen from the atmosphere to their roots, field experience has shown that the small amount of oxygen that may "leak" from plant roots is insignificant compared to the organic and nitrification oxygen demands of heavily polluted wastewater applied at practical loading rates.

Nutrient utilization by plants is less than 20% of influent values for heavily polluted wastewaters (Reed, et al,1995) even if the plants are routinely harvested. If plants are not harvested, plant utilization is largely negated when the plants die in the fall and winter. Unless plant material containing nutrients is buried in the sediments before the nutrients leach out as the plants decompose, the nutrients will return to the water column.

Submerged aquatic plants in open water areas of FWS wetlands may supply oxygen to the wastewater during daylight hours. While they have been used in wetlands treating municipal wastewater, research is needed to determine their ability to tolerate heavily polluted CAFO wastewater. Floating aquatic plant systems (e.g. duckweed, water hyacinths, and algae) have been used to treat a variety of wastewaters. However, these systems require constant removal of plants and handling of the harvested material. While the harvested material may be processed and used as feed or land applied, very few operations using floating plants have succeeded in the U.S.

Researchers have hypothesized other plant functions in treatment wetlands. Plant detritus may provide carbon for microbial reactions and enzymes exuded by plant roots may enhance degradation of some organic compounds. Certain plant species may have symbiotic relationships with beneficial microbes attached to their roots, and these relationships could be useful for treatment purposes if they can be defined. Not enough research has been conducted to validate any of these functions.

7.5.5 Risk Associated with Constructed Wetlands

The use of constructed wetlands as a treatment technology carries some degree of risk for several reasons. First, although there is no evidence of harm to wildlife using constructed wetlands, some regulators have expressed concern about constructing a system that will treat wastewater while it attracts wildlife. Unfortunately, there has not been any significant research conducted on the risks to wildlife using constructed wetlands. Although they are a distinctly different type of habitat, lagoon treatment systems have not shown evidence of harm to wildlife. The fact that lagoon systems have been in use for many years suggests that there may not be a serious risk for wetlands treating agricultural wastewater. Of course, if a wetland is going to treat wastewater with high concentrations of known toxic compounds, the designer will need to use a VSB system or incorporate features in an FWS wetland that restrict access to wildlife.

Second, although many texts and design guidelines have been published for constructed wetlands in the past 10 years (Kadlec and Knight, 1996; Payne Engineering and CH2M-Hill, 1997; Reed, et al., 1998; USDA, 1991; USDA, 1995; USEPA, 2000a), questions remain about their application, design, and performance. Constructed wetlands are complex systems in terms of biology, hydraulics, and water chemistry. There is a lack of quality data of sufficient detail, both temporally and spatially, on full-scale constructed wetlands, forcing modelers and designers to derive design parameters by aggregating performance data from a variety of wetlands, which leads to uncertainties about the validity of the parameters. The design process is still empirical, that is, based upon observational data rather than scientific theories. Due to the variability of many factors at constructed wetlands that have been observed by researchers (e.g., climatic effects, influent wastewater characteristics, design configurations, construction techniques, operating parameters, and maintenance practices), there will continue to be disagreement about some design and performance issues for some period of time.

Third, there are several common misconceptions about constructed wetlands. Some people think that VSBs and FWS wetlands are aerobic systems, or at least have many aerobic microsites. As noted in the previous discussion of plants, this is not true. Another myth is that constructed wetlands remove large amounts of nutrients. As discussed previously, although some nutrient removal does occur, it is not at the high levels reported in some early research.

Finally, as noted in a review of constructed wetlands for wastewater treatment by Cole (1998), constructed wetlands are not uniformly accepted by all state regulators or EPA regions. Some authorities encourage the use of constructed wetlands as a proven treatment technology. Others still consider them to be an emerging technology due in part to concerns about the issues discussed above. As with any new treatment technology, uniform acceptance of constructed wetlands will take some time.

7.5.6 Application and Performance of Constructed Wetlands for Agricultural Wastewaters

Although an operation in Iowa has used a constructed wetland since the 1930's, constructed wetlands have been more commonly used to treat agricultural wastewaters in the United States for about 10 years. The USDA-NRCS issued guidance on constructed wetlands for agricultural wastewater treatment in 1991 (USDA, 1991). The U.S. EPA's Gulf of Mexico Program funded a project to assess the use of constructed wetlands for CAFO wastewater in the late 1990's (CH2M-Hill, 1997; Payne Engineering and CH2M-Hill, 1997; Knight, et al., 2000). The study depended primarily on data from a subset of the North American Treatment Wetland Database, v 2.0 (NADB) (USEPA, 1999) and summarized the performance of wetland systems (Table 7.3).

Table 7.3. Performance Data Summarized for Gulf of Mexico Program (CH2M-Hill, 1997)

Parameter	Influent (mg/L)	Effluent (mg/L)	Reduction (%)
BOD_5	263	93	65
TSS	585	273	53
Ammonia	122	64	48
Total Nitrogen (TN)	254	148	42
Total Phosphorus (TP)	24	14	42

The entire NADB lists 135 wetland treatment systems at 69 sites that use constructed wetlands to treat agricultural wastewaters (Table 7.4).

Table 7.4. Agricultural Treatment Wetlands in the NADB

Animal Type	Wetland Type						Total Systems	Number of Sites
	Marsh			Open Water	Floating Plants	Other or Not Shown		
	FWS	VSB	Other					
Dairy	50	1		2	2	5	60	39
Swine	40		18				58	19
Cattle	5	2				2	9	8
Poultry	2			1		2	5	1
Aqua	3						3	2
Total	100	3	18	3	2	9	135	69

The wetlands are located in 18 states throughout the United States and in 5 Canadian provinces. A wide variety of plant species have been used, but cattails (*Typha*), grasses/reeds (e.g. *Phragmites*), and

sedges/rushes (e.g. bulrush (*Scirpus*)) were the predominant plants in 48%, 28%, and 14% of the systems, respectively. Floating plants, such as duckweed (*Lemna*), were predominant in 4% of the systems. The wetlands range from experimental systems at research farms to full-scale systems, so their size and costs vary greatly (Table 7.5). Because of the wide variation, the size and cost listed cannot be used for design purposes.

Table 7.5. Range of Costs and Operating Parameters for NADB Agricultural Treatment Wetlands

Parameter	Number*	Minimum	Maximum
Design Flow†	39	75 gpd	27,000 gpd
Area	127	43 sqft	116 ac
Area (per AU‡)	45	5 sqft/AU	6900 sqft/AU
Cost (per Area)	22	$1645/acre	$640,000/acre
Cost (per Flow)	13	$0.73/gpd	$174/gpd
Cost (per AU)	18	$76/AU	$6400/AU

*Number of systems in the NADB with data (out of the total of 135 systems)
†Actual flows were usually less
‡Animal Units

General treatment performance for several common wastewater parameters, shown as the 95% confidence interval about the mean, calculated from the NADB, is shown in Table 7.6. Because these are overall average values from all of the systems, regardless of size, flow or type of wastewater, the values shown cannot be used for design purposes. However, the numbers do give a general impression of the capabilities of constructed wetlands for treating CAFO wastewater. While it is obvious that effluent from these systems cannot be discharged to surface waters, the reductions are substantial and yield higher quality water for land application.

Table 7.6. 95% Confidence Interval about the Mean for all NADB Agricultural Treatment Wetlands

Parameter	Influent	Effluent	Removal
BOD_5	246 - 352 mg/L	99 - 136 mg/L	34% - 44%
TSS	501 - 956 mg/L	360 - 676 mg/L	18% - 35%
Ammonia	141 - 174 mg/L	79 - 102 mg/L	23% - 31%
TP	24 - 29 mg/L	15 - 18 mg/L	15% - 31%
Dissolved Oxygen	2.1 - 2.7 mg/L	1.4 - 2.0 mg/L	
Fecal Coliform	2×10^5 - 4×10^5	2×10^4 - 5×10^4	0.8 - 1.0 log

Figure 7.9 shows a hog operation with a lagoon flowing into a constructed wetland. The treatment efficiency is reported to yield an effluent of higher quality than a nearby municipal wastewater treatment plant. Figure 7.10 shows a ground level view of the wetland with the owner making observations for his records.

Photo courtesy of USDA NRCS.

Figure 7.9. View of a hog operation with a lagoon flowing into constructed wetlands for treatment of wastewater.

Photo courtesy of USDA NRCS.

Figure 7.10. Ground level view of constructed wetland with the owner making observations for his records.

The USEPA currently has an agreement with the Tennessee Valley Authority to evaluate the use of its ReCip system at a swine operation in Alabama. The system treats wastewater from the anaerobic lagoon that receives the flush water from the swine buildings. The preliminary results from the first year of operation are shown in Table 7.7. As expected from a system with alternating aerobic and anaerobic

conditions, the ReCip systems had good BOD_5 and ammonia removal. Also as expected for any wetland system, phosphorus removal decreased from an initial 90% removal efficiency (< 10 mg/L in the effluent) to 20% removal (40 mg/L in the effluent) during the one year of operation.

Table 7.7. Preliminary Averages from ReCip System Treating Swine Wastewater

Parameter	Anaerobic Lagoon	ReCip Effluent	Removal
BOD	557 mg/L	108 mg/L	73%
Ammonia	371 mg/L	50 mg/L	86%
TP	51 mg/L	29 mg/L	43%
Fecal Coliforms			2 $\log_{10}$ units

7.5.7 Processes to Significantly Reduce Pathogens (PSRP)

Manure should be treated to effectively eliminate pathogens and applied appropriately to minimize the possibility of pathogen survival and subsequent crop contamination (IFT, 2002). An indication of the level of concern that World Health Organization (WHO), U.S. EPA, and the State of California place on the issue of proper application of recyclable materials to land is shown in Table 7.8 which presents microbiological quality guidelines and standards for the application of wastewaters to land. A PSRP is a technology that is broadly defined as one that reduces both the pathogen load and vector attraction in the environment (U.S. EPA, 1989). Typically, the pathogen reduction is a minimum of one order of magnitude.

Many factors may induce pathogen reduction occurring with various treatments such as temperature, storage length, and continuous addition of manure. Presently, facultative lagoons and composting are mostly used to manage waste at CAFOs. Likely, some pathogen reduction occurs, but it is difficult to quantify the amount. The methods that may be used in an animal feeding operation to treat manure and reduce pathogens include: composting; aerobic digestion, high temperature; anaerobic digestion at different temperatures; combinations of aerobic and anaerobic digestion; and long term storage of manure before land application.

7.5.8 Recommendation

Implement control technologies for treatment of animal waste to reduce pathogen loads prior to land application or off-site transfer. Based on review of the peer-reviewed scientific literature, and using best professional judgment, it is recommended to take steps now to reduce potential exposures to pathogens via this route. Several technologies have demonstrated the capability to significantly reduce the risk of pathogen contamination from land application of animal waste. The technologies also reduce the viability of *Cryptosporidium* oocysts, which have been found to be difficult to treat by publicly owned treatment works. These technologies are listed below.

7.5.8.1 Composting

Using either the within-vessel, static aerated pile or windrow-composting methods, the temperature of the animal wastes/manure is raised to 40°C (104°F) or higher and remains at 40°C (104°F) or higher for five days. For 4 hours during the 5-day period, the temperature in the compost pile exceeds 55°C (131°F) (U.S. EPA, 1989).

Table 7.8. Microbiological Quality Guidelines & Standards For Application Of Wastes To Land

Agency	Reuse Conditions	Helminths - No./100ml	Fecal Coliforms, No./100 ml	*Salmonella spp.*, No./ 100 ml	Enteric Viruses, No./100 ml
WHO	Crops likely to be eaten raw	≤ 1/L	≤1,000/100 ml	NR	NR
WHO	Pasture, fodder & industrial crops	≤ 1/L	NR	NR	NR
Blumenthal et al.	Crops likely to be eaten raw	≤ 0.1/L	≤ 1,000/100 ml	NR	NR
Blumenthal et. al.	Spray irrigation of pasture, fodder and industrial crops	≤ 1/L	≤ 100,000/100 ml	NR	NR
USEPA	Unrestricted irrigation of municipal Class A sewage sludge	< 1 helminth ova/4g total solids (dry weight)	< 1,000/g total solids (dry weight)	< 3/4g total solids (dry weight)	< 1 PFU/4g total solids (dry weight)
USEPA	Application of municipal Class B sewage sludge	NR	< 2 x 10^6/g total solids (dry weight)	NR	NR
NC Admin Code	Land discharge of reclaimed domestic wastewater	NR	< 14/100 ml)	NR	NR
Calif. Code of Reg	Irrigation of food crops, high exposure landscapes	NR	< 2.2/100 ml[b]	NR	NR
Calif. Code of Reg.	Irrigation of dairy pastures, low-exposure landscapes	NR	< 23/100 ml[b]	NR	NR

(a) NR = No standard recommended
(b) Standard for fecal or total coliforms

7.5.8.2 Air Drying

Animal wastes/manure is dried on sand beds or on paved or unpaved basins. The animal wastes/manure dries for a minimum of three months. During 2 of the 3 months, the ambient average daily temperature is above 0°C (32°F).

7.5.8.3 Facultative lagoons / Storage

Animal waste/manure is treated or stored in a lagoon system at a temperature of ≤ 5°C for a period of at least six months or at a temperature of > 5°C for a period of at least four months. Since all wastes must be in a lagoon for the specified period, two lagoons will likely be needed such that while one is filling, the other may be aging. This avoids short-circuiting.

7.5.8.4 Anaerobic Digestion

Animal waste/manure is treated in the absence of air for a specific mean cell residence time (i.e., solids retention time) at a specific temperature. Values for the mean cell residence time and temperature must be between 15 days at 35°C (95°F) to 55°C (131°F) and 60 days at 20°C (68°F) (U.S. EPA, 1989).

7.5.8.5 Aerobic Digestion

Animal waste/manure is agitated with air or oxygen to maintain aerobic conditions for a specific mean cell residence time (i.e., solids retention time) at a specific temperature. Values for the mean cell residence time and temperature must be between 40 days at 20°C (68°F) and 60 days at 15°C (59°F) (U.S. EPA, 1989).

7.5.8.6 Lime Stabilization

Sufficient lime is added to the animal waste/manure to raise its pH to 12 for ≥ two hours of contact. *More detailed information on Technologies 1, 2, 4, 5, and 6 in *Environmental Regulations and Technology: Control of Pathogens and Vector Attraction in Sewage Sludge (EPA/625/R-92/013 – 1999 Edition.)*

Table 7.9 shows technologies for potential use at CAFOs and their expected effect on pathogen levels (USEPA, 2001).

Table 7.9. Effects of waste treatment and management systems on pathogen reductions.[1]

Treatment Process	Maximum Reduction (%)[2]	Animal Waste	Comments
Liquid Systems			
Anaerobic lagoons	99.0% per cell	swine, dairy, beef, layers	residence time of months
Aerated lagoons	99.0% per cell	swine, dairy, beef	residence time of months
Anaerobic thermophilic digesters	99.9%	swine, dairy, beef	Temperature- dependent
Anaerobic mesophilic digesters	99.0%	swine, dairy, beef	
Constructed wetlands	99.0% per cell	swine, dairy, beef	Do not work well with high solids content, temperature-dependent
Overland flow	50.0%	swine, dairy, beef	Temperature-dependent
Solids Separation			
Aerobic (liquid fraction)	99.0%	swine, dairy, beef	
Chemical (liquid fraction)	99.0%	swine, dairy, beef	Time-dependent
Alkaline treatment (liquid or dry)	99.9%	most	Time-dependent
Thermal Process			
55-60° C	99.9%	most	Time- and temperature - dependent
> 60° C	99.9%	most	Time- and temperature-dependent
Composting	99.9%	most	Time- and temperature-dependent, need mixing for aeration

[1]Summary from USDA/EPA "Workshop on Emerging Infectious Disease Agents and Issues Associated with Animal Manures, Biosolids, and Other Similar Byproducts" June 4-6, 2001 Cincinnati, OH. (Reference in bibliography section)
[2]Maximum pathogen reductions converted from $\log_{10}$ reductions (1 $\log_{10}$ reduction = 90.0%, 2 $\log_{10}$ reduction = 99.0%, 3 $\log_{10}$ reduction = 99.9%).

Most technologies currently or likely to be used by CAFOs reduce pathogen levels up to 99%. Several factors may impair the pathogen reduction obtained with these technologies. Most of these technologies are time-dependent (some requiring months of residence time) and pathogen reduction may be lower with reduced residence time. Some of these technologies operate under conditions of continuous addition of manure, which may impede pathogen reduction. Some of the technologies like constructed wetlands and composting operate optimally under specific solids level ranges (percentage) and could have poor pathogen reductions outside those optimums. Several of these technologies (anaerobic thermophilic

digesters, constructed wetlands, and thermal processes) operate optimally under specific temperature ranges and could have impaired pathogen reductions outside those optimums.

7.6 Land reclamation

7.6.1 Non-Farm Land Applications

In large parts of the United States areas exist where untreated or semi-treated manures may be land-applied with little risk of pathogens reaching human receptors directly. These areas will allow aerobic degradation and provide a use for carbon and nitrogen in the materials. The needed research builds on the information learned from farm applications of feedlot waste, and extends it to new markets for the material. The main limitations to current off-site use of these materials are lack of information about the effects and economics of transportation.

There are two categories of non-farm land applications of CAFO wastes: on-site and off-site. On-site application could include CAFO controlled forest plots and wetlands, or perhaps a combination of trees, cropland, and wetland. Feed lot wastes could possibly be safely used on off-site applications, various land reclamation projects, forest crops, and on vegetation in uninhabited areas such as along highways.

Hard rock and coal mines have left sterile scars across thousands of square miles of landscapes in this country's mining regions, frequently covering topsoil layers with infertile subsoil, rock, and mine tailings. These are unsightly, have no habitat value, and often acidify rainwater causing downstream damage. Restoring these sites requires carefully reconstructing the conditions for pedogenesis, or soil creation. Organic material must be incorporated to establish vegetation, and annual or more frequent applications may aid in ensuring successful establishment of the conditions for sustainable vegetation. Similarly, restoration of coal mine sites may benefit from application of lime and organic material in the form of animal waste. Heavily eroded lands may also benefit from application of manure combined with dredge spoil as a step towards recreation of the soil surface.

7.6.2 Phytoremediation Projects, Sediment Recycling, and Landfill Covers

Small sites, ranging in the tens of acres, exist across the United States in locations that could potentially accommodate applications of CAFO materials several times per year. These sites are typically secure from casual human intrusion, and the plants grown on them are not consumed by people nor by livestock. Generally these sites pay for fertilizer and organic material, especially during initial installation, which could offset some transportation costs.

7.6.3 Riparian Corridors

Riparian corridors are stream bank and riverside strips of trees and other vegetation that separate agricultural fields from surface water and protect that water by filtering, degrading, and using excess fertilizer, herbicide, and pesticide. This run-off prevention system may be extremely effective both at improving stream cleanliness and at providing enhanced habitat for both terrestrial and aquatic species. Thousands of miles of riparian corridors have been planted and are continuing to be planted around the Chesapeake Bay and along the Mississippi watershed.

7.6.4 Forest Products: Short Rotation Wood Crops- Pulp & Paper, Lumber, Fuel

The wood products industry plants tens of thousands of acres of fast growing hybrid trees each year. These trees thrive on high nutrient levels. Regular applications of feedlot waste might be an ideal use if the

transportation and safety considerations may be satisfactorily explored. Forest application of treated sewage sludge has been researched, and that work might be applicable to some extent.

7.6.5 Highways: Roadsides and Medians

The thousands of miles of grassy medians and roadsides present an opportunity for beneficial disposal of CAFO materials. Regular, thin applications of liquid or solid material could provide a safe area for aerobic degradation, distant from human contact, on plants not intended for livestock consumption.

Each of these areas has needs and concerns that should be researched before application. There should be an estimate of how many acres or square miles are available of each type of terrain in various geographic regions. Different regions have different usage opportunities; for example, Appalachia and the Rocky Mountains need organic material for hard rock mine reclamation, while the Great Lakes area have dredged sediments that need organic materials to encourage contaminant degradation and plant growth in order to turn dredged material into soil suitable for beneficial reuse.

Finally the loading rate limitation for each terrain and application needs to be determined. The quantity of waste that may be safely applied to a particular project depends on the form of the waste (solid or liquid), the nutrient and chemical load of the material, and the capacity of the application to hold and utilize the material. That capacity is, in turn, based on equipment limitations, nutrient use capacity of the particular vegetation, seasonal access to sites, and climate considerations. Each use would require research and experimentation to determine the type of equipment that would be needed for application in the target terrain.

A protocol that outlines how to match resources (waste sources) with utilizers within an economical travel distance would be extremely useful. Such a guide would help local feedlot farmers, foresters, ecological restorers and others answer those questions that prevent the synergies that allow use of this material as a resource.

8 Research Needs Associated with CAFOs

8.1 Overview

Identified research needs related to CAFO issues fall into several categories. The categories are interactive and mutually supporting. One category is stressor evaluation and quantification. A second category is method development; new methods are needed to rapidly and inexpensively measure stressor levels. New methods are also needed to identify sources of stressors in the environment. A third research category encompasses process research. Process research will involve several levels of work from bench-scale to field-scale. How may waste treatment systems be optimized for control of different stressors? How may they be made cost effective? Can salable products be generated from waste streams? Different stressors will have to be addressed individually and in combination. The fourth category of research needs relates to stressors in the environment. Fate and effects of specific stressors must be elucidated. Management practice effects on stressors must be studied. Transport of stressors in different media from sources to receptors must be understood. Other topics of research that are presented in more detail are ground water research, aerosol research, and land reclamation.

8.2 Stressor Evaluation and Quantification

The first two research categories are closely related. Stressor evaluation and quantification is a fundamental need in identifying problem areas. Current methods are quite good for measuring nutrient levels in various media. Methods for sediments in water are also good. Source identification for nutrients is more of a problem. In some cases, isotope analysis of C, N, and P could lead to identification of sources of stressors. Much work needs to be done to make isotope methods more readily applicable. Quantitative analysis of antibiotics, EDCs, and pathogenic microorganisms in waters, soils, sediments, and manures is needed to evaluate stressor content and movement. Rapid, precise methods need to be developed for analysis of these stressors in the different matrices. Methods for analysis of EDCs and antibiotics in different matrices will ultimately rely on GC-MS and HPLC-MS for quantification. Analysis of pathogenic organisms will require a completely new approach. Currently, fecal coliforms (FC) and fecal streptococci (FS) are used as indicators of fecal pollution. There may easily be cases where pathogenic organisms may exist with no associated FC or FS. The best approach requires developing methods that may be applied to water, soil, sediment, or manure to directly detect and quantify specific pathogens.

The organisms most commonly implicated in human illness should be included in the test method. Among the organisms of concern are *E. coli* O157:H7, *Salmonella* spp., *Campylobacter jejuni*, *Listeria monocytogenes*, *Leptospirillum* spp., *Cryptosporidium parvum*, and *Giardia lamblia*. These bacterial pathogens are perhaps the most readily detected and most commonly implicated in causing health problems. With the advent of genetic analysis methods, it is possible to develop means to specifically identify organisms and track them to their source. Work has been done on source identification with some organisms in agricultural areas of Oregon and California. Protozoan parasite detection and enumeration is much more difficult. Currently, the methods require large sample volumes, are laborious, and require highly skilled analysts. Development of rapid methods for identification and enumeration of protozoan parasites is highly desirable.

Associated with the need for microbiological methods is the need to determine the survival of known pathogens under different conditions. Treatment or storage of manures should have effects on microbial populations. These effects should be determined to establish the utility of different treatment systems for reducing pathogen loads. Detection and enumeration methods for the different organisms are required to

address this need. Compilation of a database of microbiological information is needed to assess and track epidemiological information related to pathogens in animal waste. Little of this information is readily available. Similarly, the database should include animal disease epidemiological data as well. Existing literature on baseline mortality of animals needs to be compiled as well. The potential financial loss from an outbreak of animal pathogens is on the order of several billion dollars.

8.3 Process Research

The third major category of research needed to address the environmental challenges of CAFOs is process research. Process research entails examination of waste handling in the different sectors of agriculture. Different treatment processes are effective in controlling different stressors. Waste treatment processes with potential application to animal waste include lagoon storage and lagoon modification, aerobic digestion, anaerobic digestion, staged aerobic/anaerobic digestion, thermophilic digestion, composting, and lime treatment. Much work is needed to optimize these systems for controlling the different stressors. Conditions of treatment that control nutrients may have little effect on pathogen survival or may even encourage regrowth.

Stabilization of nutrients by alum is a new area of research. The use of alum on poultry litter has shown greater promise in stabilizing P to prevent its runoff to surface waters and leaching to ground waters. Alum also stabilizes ammonia, making poultry litter more valuable as a fertilizer. Conditions that control pathogenic organisms may have little effect on nutrients. The different systems must be optimized for waste type, stressor reduction and cost.

Another aspect for cost control is configuring treatment systems to generate salable products. Anaerobic systems offer the possibility of CH_4 production. Some processes may recover fertilizer elements in condensed forms that are more readily salable. Methane may potentially provide energy for operation on the farm. As a lower cost alternative, composting is a useful treatment alternative. Establishing performance characteristics for different animal wastes and effects on different stressors is an important goal. Performance of poorly practiced composting must be established with regard to stressor control. While the major effort will focus on systems for larger CAFOs, the smaller producer should have alternatives for waste handling available. Smaller systems should be developed to address the same problems for the smaller producer. A complete systems approach will be needed to optimize nutrient control, pathogen control, and value recovery.

8.4 Fate and Effects of Stressors in the Environment

The fate and effects of stressors in the environment and the transport of those stressors in the environment generate questions that are difficult to answer. Land application is a major practice for the disposal of animal wastes from large and small facilities. The effectiveness of buffer strips with different types of vegetation, width, and interaction with other soil management procedures should be evaluated. Related to land application is the control of sediment generation from application sites and CAFO facilities themselves. Study of engineered structures to collect sediments and management techniques is needed with regard to other stressors that may move with sediments. Sediments offer attachment sites for nutrients, EDCs, and pathogens. How effective is reducing sediment movement in reducing other stressor movement into waterways?

Another water management tool proposed to be useful in waste management is the constructed wetland. How do constructed wetlands perform over long term use under different climatic conditions?

Are they efficient in solid/liquid separation? What functions do different aquatic plants carry out? How are they best monitored for performance? Do they function to remove excess phosphorus? What air emissions may be expected from different types of wetlands?

8.5 Ground Water

Future research related to CAFO impact on ground water may be categorized into the following broad areas: 1) transport and fate; 2) hydrogeology; 3) testing and monitoring; 4) risk management; 5) prevention; 6) predictive modeling; and 7) impact of CAFOs on ground water resources. Improved knowledge of the major factors affecting nutrient transformation, transport, and reactions in ground water is an area that requires attention by soil/environmental scientists, hydrologists, hydrogeologists, and environmental engineers. Research is needed to understand the fate of nitrogen under aerobic and anaerobic conditions (nitrate, ammonium, organic-nitrogen) in stream riparian buffers, wetlands, and hyporheic zones (i.e., groundwater-surface water interface). Transport of nitrate by preferential flow from treated soil/storage ponds to ground water and/or tile drains is a critical area of research. Research documenting phosphorus losses from soil receiving manure via subsurface tile drainage is limited. Leaching of solutes below earthen waste ponds/lagoons to deep ground water, where the primary mode of transport to ground water is unsaturated flow, warrants further research. The mechanism of self-sealing, particularly the effect of wetting/drying cycles on reducing the extent of sealing in lagoons is an area that needs further research. A method needs to be developed to account for sealing effects and related factors, such as temperature, waste characteristics, soil structure and texture, pond depth, and frequency of pump down.

The survivability and transport of manure pathogens in soil and aquifers is not well characterized, especially transport mechanisms for *Cryptosporidium* oocysts in the subsurface. More studies and information are needed on their movement in soils. Studies are needed to investigate the impact of periodic freezing-thawing -- a common phenomenon during United Kingdom winters particularly in upland sheep-farming areas (ref?). Little research has focused on the role of plant roots and micro- and mesofauna in the translocation of pathogens. The importance of preferential transport of microorganisms by macropores from treated soils and/or leachate from earthen storage ponds warrants future research. Further investigation is needed into the effectiveness of riparian buffers and wetlands for removal of pathogens from subsurface water. Improved fundamental understanding of sorption/desorption characteristics and die-off rates of microorganisms in different soils and aquifer sediments is essential in designing for and evaluating the efficacy of alternative mitigating measures.

Continued research on fundamental understanding of movement of ground water (hydrogeology) in unsaturated soil (vadose zone hydrology) is a major prerequisite for studying source and prevention issues. Research is warranted to investigate seepage losses from storage pond side slopes subject to frequent water level fluctuations. Technology is needed for measuring infiltration for low permeability soils. Further research is warranted to compare evaporation from clear water and animal wastewater, which may affect water balance in ponds and thus seepage losses.

Standardized methods are needed that may relate P quantity and intensity factors to desorption and downward movement of P and thus to the potential for P loss in subsurface runoff; i.e., soil tests for predicting potential for P loss in leaching and drainage waters. Soil monitoring methods to accurately track nutrient leaching in soil to ground water warrants further research.

Operational research (e.g., systems analysis and optimization) and modeling are important research areas, especially for risk management at the watershed scale. Because of uncertainty in seepage rates and

other environmental factors, effort should be directed toward the development of stochastic, risk-based approaches for the design and performance evaluation of detention ponds/lagoons. Developing a reliable, risk-based regulatory system that would be acceptable to regulators, operators, and the general public is a future research need. Developing predictive models based on sound scientific principles for assessing the impact of CAFOs on ground water and for risk-management in watersheds is an area of future research.

Preventing pollutants derived from animal waste from reaching ground water may result in substantially reduced costs, otherwise incurred with treatment or removal of pollutants in drinking water. This would require developing appropriate management practices for animal waste to reduce potential groundwater pollution, e.g., by nitrate and pathogens. Methods need to be developed to evaluate the impact of animal waste management practices at the individual, local level and at the integrated, watershed level.

Models are useful tools to identify sources and to estimate the relative loading of pollutants from various management scenarios. Their role is best realized in complementing and not replacing environmental monitoring. Rather than relying on costly intensive monitoring, simulation models may aid in the development of cost-effective and optimal monitoring network. More effort is needed for modeling pathogen transport and fate in the soil and groundwater. Models need to be revised to account for the complex interactions governing movement of microorganisms and other pollutants in soils as well as in micropores. Incorporating a macropore flow component may improve the performance of models to predict the fate of injected animal manure. Because of uncertainty in seepage rates and factors governing movement of pollutants (e.g., pathogens, nutrients, and salts), probabilistic/stochastic-based modeling approaches will be needed for risk-based planning and decision making.

Evaluating the performance of alternative abatement measures will benefit from improving the capability of current watershed models to simulate the capacity of riparian buffers, vegetative filtering strips, detention reservoirs, natural/constructed wetlands, and tillage practices to reduce the impact of manure from agriculture and runoff from storage facilities on water quality. Developing modeling systems that integrate processes across watersheds (both surface and groundwater) warrants further research. Integrating modeling technology with systems analysis will be needed for optimal selection of alternative abatement strategies.

Future research may be needed to address the following institutional questions: At what level is risk management conducted (individual home, farm, or community)? What strategies are used to control groundwater contamination? How do we make decisions on whether to do community treatment versus point-of-use treatment versus development of new water resources? Research is required to emphasize the need to forge a working relationship among scientists, regulatory agencies, and stakeholders to develop BMPs that are both environmentally sound and feasible in the short and long terms. Research is warranted on the impact of socio-economic and political constraints on environmentally effective decision-making.

8.6 Aerosol Research

Aerosol issues form another field of work in the handling of CAFO waste. Often, the first environmental impact of a CAFO is the odor generated by the animal waste. With the concentration of large numbers of animals in smaller areas the potential for odor generation is high. The public may perceive problems in such areas if the odors generated are irritating. Production of particulates from CAFOs is a concern because the particulates may easily fall into the regulated size classes of PM2.5 or PM10. PM2.5 particles are respirable deep into the lung and may be a source of irritation or infection. Do particulates carry intact microbial cells, endotoxins, and allergens? Can they be detected? Are there species-specific

aerosol patterns related to housing types and waste system types? Can housing systems be designed to minimize particle generation? Odor impacts are largely subjective and difficult to measure objectively. Can a classification system be created to make objective measures of odor problems? The system must be able to identify and quantify odors with regard to duration, intensity, frequency and offensiveness. Are there good emission rate models for ammonia, H_2S, VOCs, and particulates? Are there ways to reduce emissions?

Ammonia falls into more than one group of problems because it has a strong odor, is a nutrient, and may attach to particles. Volatile organic compounds also contribute to odor problems. Many of these compounds are contained in manure and are created by microbial action during storage or digestion of the manure. Can the processes used for waste handling be modified to reduce odor generating organic compounds? Staged treatment processes may be able to reduce odor compounds concurrent with treating the waste for other stressors. Would a biofilter be able to reduce odor compounds sufficiently to reduce the impact of odors?

8.7 Land Reclamation

Reclamation of disturbed land is another possible use for animal waste. Many areas of the United States have large tracts of land seriously disturbed by many causes. Strip-mined land, mine spoil banks, seriously burned-over land, and new highway construction may create highly disturbed land. Much of the soil replaced or exposed in these areas has little protection from further degradation from erosion and supports poor plant growth. A potential use of animal manure is to create new soils by mixing manures with excavated dredge spoil from waterways and application of the material to unproductive land. The manure contributes organic matter and nutrients to the soil. Manure also conditions the soil to be more friable and hold more water for plant growth. The amount of available land in different classes and the quantity of manufactured soil that could be applied at one time must be determined. Another use for manufactured soil is restoration of heavily eroded soil in the United States. Return of soil material to areas that have experienced losses of topsoil could be a beneficial use of manure composted together with freshwater dredge material from the large river systems in the United States. The U. S. Army Corps of Engineers moves about 100 million tons of dredge material every year. Some of this material could be composted together with manure to make a product that could replace eroded soils.

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Eric Winiecki Declaration
Exhibit H

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101-3140

ENFORCEMENT &
COMPLIANCE ASSURANCE
DIVISION

September 23, 2021

Mark Larsen
Project Coordinator
ANCHOR QEA, LLC
1119 Pacific Avenue, Suite 1600
Tacoma, Washington 98402

Eric Weber
Project Coordinator
Landau Associates
2107 South C Street
Tacoma, Washington 98402

Re: Groundwater Monitoring
Administrative Order on Consent ("Consent Order")
Docket No. SDWA-10-2013-0080
Yakima Valley Dairies, Washington

Dear Mr. Larsen and Mr. Weber:

On Friday, August 18, I wrote you an email message stating, "In reference to our August 5, 2021 meeting, please inform EPA by September 7 that you intend to continue quarterly groundwater monitoring, the next round of which is slated to occur on or near October 1, 2021." I have not received a clear statement of intent from either of you. This letter reiterates information and a proposal that EPA presented to you during the August 5, 2021 technical meeting in which we discussed the path forward in finalizing work under the Consent Order, in a way which would allow the Dairies not to have to take on additional source controls at this time.

The eight years of quarterly groundwater monitoring required by the Consent Order concluded this summer on or around July 1, 2021. The goal of the Consent Order, to "…achieve drinking water quality that meets the EPA maximum contaminant level ("MCL") for nitrate of 10 mg/L in the drinking water aquifer beneath and downgradient of the Dairy Facilities," has not yet been achieved in many monitoring wells. In addition, there is a significant number of groundwater monitoring wells located downgradient of potential sources of nitrate on the Dairy Facilities in which the nitrate concentrations are not trending downward.

During the meeting, because nitrate source control work is ongoing, and because there is an unknown and variable time lag between source control actions and any resulting decrease in groundwater nitrate concentrations, EPA proposed that the Dairies continue groundwater monitoring for eight more years. EPA reiterates the request that Respondents continue groundwater monitoring on or around October 1, 2021, in accordance with the existing Consent Order monitoring requirements (e.g., same wells, same analytes, same reporting).

As you are aware, the Consent Order was agreed by the Dairies and issued by EPA in March 2013 in accordance with EPA's authority under the imminent and substantial endangerment provision of Section 1431 of the Safe Drinking Water Act. The Act states,

> "… upon receiving information that a contaminant which is present in or is likely to enter an underground source of drinking water may present an imminent and substantial endangerment to the health of persons, and that appropriate State and local authorities have not acted to protect the health of such persons, EPA may take such action as deemed necessary in order to protect the health of such persons…"

As demonstrated by the administrative record upon which the Consent Order rests, these conditions were manifest in 2013 when the Consent Order was signed. Data collected by the Dairies over the past eight years are generally consistent with data collected by EPA and others prior to the Consent Order. Based on data collected by the Dairies, the conditions that support a finding of imminent and substantial endangerment remain today.

The basic structure of the Consent Order is adaptive management --- implement source controls and then monitor the groundwater for eight years to see whether the nitrate concentrations decline --- if not, then the implementation of additional source control measures is required. The eight-year period of groundwater monitoring just concluded this summer and we are now in an assessment phase. The "Eight Year Report," and the Source Investigation and Supplemental Source Control Plans are due within the next year. Based on preliminary statistical analysis of the available eight years of the Dairies' groundwater data, of the downgradient Consent Order monitoring wells that exceed the MCL, about two-thirds show no trend or an increasing trend, which, in accordance with the Consent Order, would trigger additional source control actions.

At the time the Consent Order was signed, the time period of eight years of groundwater monitoring was a negotiated time frame that was not based on technical analysis. The amount of time between source control actions on the land surface and any response in groundwater quality would be expected to vary depending on many unmeasured uncertainties such as the effectiveness of source control action(s), the amount of stored excess nitrogen in the soil column, the rate at which nitrogen-containing compounds convert to nitrate, the amounts and timing of irrigation and precipitation, the rate of percolation of nitrate-contaminated water through the vadose zone, depth to groundwater, soil particle sizes and porosity, and the rate of lateral groundwater movement from aquifer entry to a well.

Most of the lagoon-lining actions have occurred in the last several years and their effect on groundwater nitrate concentrations may not be realized. Additional lagoon lining and abandonments are occuring this fall and next year, and any positive groundwater impacts from those actions have not yet been and will not be realized for some time. In addition, several DeRuyter fields still do not meet the 45-ppm target at the 2-foot depth after eight years of the Dairy working to reduce excessive nitrate concentrations in its fields. At the time the Consent Order was signed, EPA anticipated that any fields that exceeded the 45-ppm target at that time could be brought under control to meet the 45-ppm target within several years, but this has not been the case for all fields. For these reasons, EPA has proposed continuing groundwater monitoring for, at minimum, an additional eight years.

In EPA's view the most efficient way to accomplish the change to the Consent Order to provide for these additional years of monitoring is to utilize Consent Order Section VIII. Additional Work, or Section XV. Modifications. This approach would not require relatively time-consuming and costly

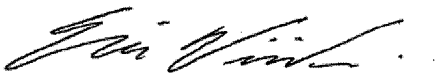
amendment of the Consent Order. EPA suggests that the Dairies' Project Coordinator send EPA's Project Coordinator a letter proposing eight years of additional monitoring, and proposing to extend the schedule for submittal of the Source Investigation QAPP (Consent Order Section III.G.2.a.) the Source Investigation Report and Supplemental Source Control Plan(s) (Section III.G.2.a.), and the Supplemental Source Control Plan (Section III.G.2.b.), until after the additional eight years of groundwater monitoring is completed, commensurate with the existing schedules in the Consent Order, but adjusted eight years in the future.

EPA expects the Dairies to continue Consent Order quarterly groundwater monitoring because the Consent Order goal is not yet met and the situation existing may present an imminent and substantial endangerment to the public, the SDWA Section 1431 standard. EPA's understanding is that the next round of sampling to be conducted pursuant to the Consent Decrees between the Dairies and CARE is scheduled to occur on or around October 1, 2021, and the Dairies should incorporate the Consent Order groundwater sampling into this field effort. You should conduct both at the same time as you normally would.

Note that the conclusion of the first eight years of groundwater monitoring has no effect on the Dairies' other obligations under the Consent Order; for example, other work must continue such as maintenance and reporting requirements, irrigation water management, leak detection of already-lined lagoons, sampling application fields in the spring and fall, etc., until the Consent Order is terminated by EPA.

You may contact me at (206) 553-6904, or your legal counsel may contact Jennifer MacDonald at (206) 553-8311, if you have any questions regarding this letter.

Sincerely,



Eric Winiecki
EPA Project Coordinator
Enforcement and Compliance Assurance Division

cc: Jennifer MacDonald
Rene Fuentes

Eric Winiecki Declaration
Exhibit I

6720 S Macadam Avenue, Suite 125
Portland, Oregon 97219
503.670.1108

ANCHOR QEA

August 15, 2022

Eric Winiecki
United States Environmental Protection Agency
Region 10
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101-3140

Re: Second Quarter 2022 Groundwater Monitoring Data Report, Yakima Valley Dairies, SDWA-10-2013-0080

This quarterly groundwater monitoring report (report) has been prepared to supplement groundwater data collection initiated under the Administrative Order on Consent (AOC) Statement of Work.

The AOC requires 8 years of quarterly groundwater monitoring, which was completed in Second Quarter 2021. Under the AOC, this 8-year monitoring period is to be followed by data evaluation and a formal determination of next steps. This data evaluation process is now beginning.

Pending completion of the data evaluation process and definition of next steps under the AOC, the U.S. Environmental Protection Agency (EPA) and the Respondents to the AOC exchanged correspondence regarding the value of conducting continued nitrate monitoring. The monitoring data contained in this report were collected voluntarily consistent with a written proposal made by the Respondents in a letter to EPA dated October 4, 2021, and repeated in follow-up letters dated November 11, 2021, and December 10, 2021. In the December 10, 2021, letter, the Respondents informed EPA that they planned (during the following week of December 13, 2021) to voluntarily perform the groundwater monitoring event documented in this report. The Second Quarter 2022 groundwater monitoring event was then voluntarily conducted from March 14 to March 15, 2022.

EPA replied to the Respondents' groundwater monitoring proposal in a letter dated January 25, 2022. In that letter, EPA stated that the AOC did not require continued groundwater monitoring at this time but that it was consistent with the goals of the AOC.

Groundwater monitoring was conducted using methods defined in the 2018 *Groundwater Monitoring Quality Assurance Project Plan* (QAPP; Anchor QEA 2018). As approved in the QAPP, the second quarter of each year is considered an annual event, and all 26 AOC wells are sampled. Deviations from the QAPP as part of the Second Quarter 2022 monitoring event were as follows:

- Monitoring parameters were limited to those identified in the October 4, 2021, proposal from the Respondents to EPA and included groundwater elevation, groundwater field parameters, and nitrate concentrations.

- The analytical testing laboratory used during early 2021 (Cascade Analytical) was unavailable to perform the nitrate testing for the project. The lab previously used during AOC groundwater monitoring (ALS Environmental) was used instead for the monitoring event.
- Transducer data from the Second Quarter 2022 are not presented from wells DC-05D, YVD-03, YVD-08, or YVD-11 in this report. The transducers in wells YVD-03 and YVD-08 were lost down their respective wells and could not be recovered. The transducers in wells DC-05D and YVD-11 would not connect to the downloading device and were sent to the manufacturer to recover the data. The transducers in DC-05D and YVD-11 have not been replaced.

The locations of the monitoring wells are shown in Figure 1. The wells monitored in the current event are listed in Table 1.

Groundwater Monitoring Activities

Depth to Static Water Level Measurement

Water level measurements were collected from all 26 wells in the monitoring network on June 5, 2022, using an electronic water level meter. The depths to water were measured to the nearest 0.01 foot from the indicated reference point on each well casing and recorded on the Water Level Survey Form presented in Appendix D of the 2018 QAPP. The depth-to-water measurements were collected from the 26 wells in as short a time period as possible (approximately 8 hours) to provide a "snapshot" of groundwater elevations and to reduce the effect of atmospheric pressure changes or precipitation effects on the water levels. Depth-to-water measurements were converted to groundwater elevations in the North American Vertical Datum of 1988 (NAVD88) by subtracting the measurements from the surveyed reference point elevation for each well. The depth-to-water measurements and calculated groundwater elevations for Second Quarter 2022 are shown in Table 2.

Continuous Groundwater Elevation Monitoring

Continuous long-term groundwater elevations are being monitored using non-vented Solinst Levelogger Junior Edge pressure transducers in six monitoring wells to evaluate seasonal fluctuations and trends in groundwater elevations. Two pressure transducers are installed in one of the shallow/deep monitoring well pairs to evaluate differences in hydraulic head and vertical gradients between the shallow and deep portions of the surficial aquifer. Wells with transducers include DC-03, the DC-05/DC-05D well pair, YVD-03, YVD-08, and YVD-11. Additionally, a Solinst Barologger Edge barometric pressure transducer is deployed at well YVD-08 to compensate water levels for atmospheric pressure.

Transducers recorded water levels in hourly increments from 12:00 p.m. on October 15, 2013, through December 7, 2020, at 8:00 a.m. Beginning December 7, 2020, at 8:45 a.m., the transducers began recording water levels in 15-minute increments to provide more accurate calibration with

manual depth to water measurements. During data downloads, depths to water in wells were manually gauged using an electronic water level meter. Groundwater hydrographs of the six wells with pressure transducers are provided in Appendix A.

The suspension line used to hang transducers in two wells, YVD-03 and YVD-08, broke during the Fourth Quarter 2021 groundwater monitoring event, and the transducers fell to the bottom of their respective wells. Recovery of the transducers has not been possible with either hooks or magnets due to stainless-steel weights placed on top of the transducers to properly position them. To date, the transducers have not been replaced in the wells, and no transducer data are available since Fourth Quarter 2021.

The transducers in wells DC-05D and YVD-11 would not connect to the downloading device during the First Quarter 2022 event and were sent to the manufacturer for repair and data extraction. Data extraction was completed; however, as of Second Quarter 2022 the transducers have not been replaced in the wells, and no transducer data are available since First Quarter 2022.

Groundwater Elevation Seasonal Patterns

The hydrographs for many of the monitoring wells show a seasonal pattern of water level increases and decreases. For example, the water level in monitoring well YVD-02 historically increased about 12 feet from first quarter to second quarter before an adjacent irrigation ditch was converted to a closed pipe, after which the seasonal pattern became less pronounced.

Another example of seasonal water level fluctuation is observed in well YVD-17, which is located adjacent to the large, unlined Southside irrigation canal run by the Sunnyside Valley Irrigation District (Figure 1). According to the District fact sheet, irrigation usually runs from April 1 through October 20 with canal priming operations beginning in mid-March. The water elevation in YVD-17 varies seasonally by about 6 feet. The lowest water level of each year has consistently occurred in the first quarter (approximately April 1), and the highest water level of each year has consistently occurred in the third quarter (approximately October 1). This suggests that the travel time of water from the flowing irrigation canal to the relatively shallow drinking water aquifer at YVD-17 is likely in the range of days to weeks.

EPA has concluded that the seasonal fluctuations observed at monitoring wells indicate that percolation of water from the land surface to the aquifer in the vicinity of the Dairies can and does occur in a range of days to months. The time of travel depends on many factors including the soil type, existing amount of water in the soil, the duration and amount of water, evapotranspiration, and depth to the water table. The percolating water could originate from surface water such as a canal or pond, excess irrigation water from a field, an earthen lagoon, precipitation, or some other source.

The groundwater elevation seasonal patterns for each monitoring well are shown in Figure 2 and the following table:

Monitoring Well ID	Clear Seasonal Pattern? (Y/N)	Well Depth from Ground Surface to Mid-Point of Screen (feet)	Highest Groundwater Elevation in 3Q (Fall) and Lowest in 1Q (Spring)	Highest Groundwater Elevation in 4Q (Winter) and Lowest in 2Q (Summer)	Highest Groundwater Elevation in 1Q (Spring) and Lowest in 3Q (Fall)
YVD-02	Y	25	X		
YVD-17	Y	38	X		
DC-04	Y	40	X		
DC-07	Y	49		X	
DC-03	Y	73	X		
DC-05	Y	74		X	
YVD-14R	Y	81		X	
YVD-10	Y	93			X
YVD-15	Y	95		X	
YVD-11	N	107			
DC-03D	Y	111	X		
YVD-09	N	112			
YVD-16	Y	112			X
DC-05D	Y	122		X	
YVD-13	Y	131		X	
DC-14	N	139			
YVD-12	Y	141			X
DC-01	N	150			
YVD-07	Y	158			X
YVD-06	Y	159			X
YVD-05	Y	172			X
YVD-08	Y	172			X
YVD-18	Y	175		X	
DC-09	Y	184			X
YVD-03	Y	190			X
YVD-04	Y	235			X

Sample Collection

Groundwater samples were collected using low-flow purging and sampling procedures described in the Standard Operating Procedure (SOP) entitled *Low-Flow Groundwater Purging and Sampling Procedures for Monitoring Wells* presented in Appendix E of the 2018 QAPP.

Purging and sampling of the monitoring wells was performed with dedicated 1-inch-diameter stainless-steel Solinst Model 407 bladder pumps with polytetrafluoroethylene (Teflon) bladders installed in each well.

A sample could not be collected at monitoring well YVD-02; the well was dry during the groundwater monitoring event.

Sample Handling and Custody

All samples were accompanied by a chain-of-custody record according to procedures described in the 2018 QAPP. When custody of samples was transferred, the individuals relinquishing and receiving the samples signed and dated the chain-of-custody record. The chain-of-custody record documents the custody transfer from the sampler, often through another agent (e.g., a shipping/transport company), to the laboratory sample custodian.

All samples collected for laboratory analyses were delivered to ALS Environmental, located at 1317 South 13th Avenue in Kelso, Washington. Four sample delivery groups (SDGs) were submitted to the analytical laboratory; the delivery groups and collection dates are as follows:

Sample Delivery Group	Samples Collected	Date Received by Laboratory
K2206116	June 5, 2022	June 6, 2022
K2206160	June 6, 2022	June 7, 2022
K2206237	June 7, 2022	June 8, 2022
K2206299	June 8, 2022	June 9, 2022

Field Sampling Data Sheets were completed for each sample and indicate what type of samples were collected, sample identification, sample bottle types and volumes collected, field parameter measurements, and other pertinent information (including significant events and observations that occurred during sampling activities). Enough information was noted on field sampling forms to enable participants to reconstruct events that occurred and to refresh the memory of field personnel, if needed. Original copies of all field forms and chain-of-custody documents were retained by the Yakima Valley Dairies'[1] (Dairies') Field Lead in the project files. Dairy owner certifications are included in Appendix B. Copies of the field forms from Second Quarter 2022 are presented in Appendix C.

[1] Collectively, the following are referred to as the Yakima Valley Dairies: 1) Cow Palace, LLC; 2) D&A Dairy, LLC (also known as D and A Dairy L.L.C.), George DeRuyter & Son Dairy, LLC, and George & Margaret, LLC; and 3) Liberty Dairy, LLC, and its associated dairy facility H&S Bosma Dairy.

Analytical Program

Corrective Actions

No corrective actions were required for the Second Quarter 2022 sampling event.

Data Review, Verification, and Validation

All data underwent a Stage 2 validation, which included a data package completeness review. Data were validated in accordance with the EPA *National Functional Guidelines for Superfund Organic Methods Data Review* (EPA 2014). The Data Validation Report (DVR) is presented in Appendix D. Any deviation from the 2018 QAPP was either documented within this memorandum or in the DVR. Results met project data quality goals and criteria and are usable for all purposes. Refer to Table 3 embedded in the DVR for a list of the qualified results from the data validation process. Qualified results include the following:

- Eight samples from SDG K2206237 were analyzed past the 48-hour hold time for nitrate as nitrogen analysis via EPA Method 300.0. Results were qualified "J" or UJ" to indicate a potentially low bias.

Groundwater Monitoring Results

Site Hydrogeology

The groundwater flow direction at the site is generally to the southwest at an average hydraulic gradient of 0.013.[2] Hydraulic gradients are greater in the topographically higher areas in the northern section of the site, with an average of 0.026. As groundwater flows to the southwest toward the center of the Yakima River valley, hydraulic gradients decrease to approximately 0.011 in the central portion of the site and then decrease further to 0.004 in the southern portion of the site. The estimated average linear groundwater flow velocities for the shallow surficial aquifer at the Dairies range from 0.7 to 24.9 feet per day across the site. These estimated values are based on estimated conductivity values based on observed soil types and have not been confirmed with site-specific aquifer testing (e.g., slug tests).

A groundwater elevation contour map for the surficial aquifer based on Second Quarter 2022 depth to groundwater measurements is shown in Figure 1. Groundwater elevation measurements for Second Quarter 2022 and monitoring well construction details are provided in Tables 2 and 3, respectively. Historical groundwater elevations are provided in Table 4. Estimated possible average linear flow velocity values for Second Quarter 2022 are provided in Table 5. Groundwater hydrographs for all 26 wells are provided in Appendix A.

[2] Hydraulic gradients values are in units of vertical feet per horizontal feet and are presented dimensionless.

Groundwater Sampling Results

Groundwater field parameters collected during well purging included dissolved oxygen, pH, oxidation-reduction potential, specific conductance, temperature, and turbidity. Field parameter measurements are presented in Table 6.

Groundwater from the 26 wells sampled was analyzed for nitrate (as nitrogen).

The nitrate results for Second Quarter 2022 are presented spatially on a map in Figure 3 and are shown in Table 7. Historical nitrate concentrations since 2013 are presented in Figure 4 and plotted in Figures 5 through 9. A summary of historical groundwater analytical results is presented in Table 8. Analytical laboratory reports are provided in Appendix E.

The monitoring well network includes wells that are located upgradient and downgradient of the Dairies. There are four groundwater monitoring wells located upgradient of the Dairy facilities' footprint. All four wells are screened at the water table. Historically, the nitrate concentrations in the four upgradient wells have been consistently below the nitrate maximum contaminant level (MCL) of 10 milligrams per liter (mg/L). As noted previously, YVD-02 was dry during Second Quarter 2022, and a sample could not be collected. YVD-02 is screened in a shallow basalt layer just downgradient of a former irrigation canal that has now been replaced by an enclosed pipe. After the open ditch was replaced by the piped conveyance, groundwater elevations decreased in the well until the well went dry; a sample has not been collected from YVD-02 since Second Quarter 2020.

Nitrate concentrations reported in mg/L in the upgradient monitoring wells for Second Quarter 2022 are as follows:

Upgradient Well	Nitrate (mg/L)
DC-01	7.80
YVD-02	Not Sampled
YVD-03	5.08
YVD-04	4.70

Nitrate concentrations in the 21 downgradient monitoring wells that are screened at the water table for Second Quarter 2022 are as follows:

Downgradient Well	Nitrate (mg/L)
DC-03	157
DC-04	34.5
DC-05	41.7
DC-07	28.5

Downgradient Well	Nitrate (mg/L)
DC-09	6.76 J
DC-14	57.4 J
YVD-03	5.08
YVD-04	4.70
YVD-05	5.60
YVD-06	0.67
YVD-07	4.30
YVD-08	69.1 J
YVD-09	60.7
YVD-10	55.3
YVD-11	82.7
YVD-12	19.5
YVD-13	36.2 J
YVD-14R	125
YVD-15	16.3
YVD-16	21.0
YVD-17	0.61

Note:
J: estimated value

Nitrate concentrations exceeded the MCL in 14 of the 21 downgradient water table wells tested during the Second Quarter 2022 monitoring event.

In two cases the patterns of groundwater nitrate concentrations may be responding to changes in groundwater infiltration and elevation patterns as follows:

- Nitrate was detected above the MCL in well DC-07 at a concentration of 28.5 mg/L. Nitrate concentrations in this well were historically below the MCL between 2013 and Second Quarter 2020. Since Second Quarter 2020, the MCL has been exceeded six times out of eight completed monitoring events. The change in groundwater quality at this well follows the termination of clean chiller water discharges to a ditch located upgradient of the well. That chiller water discharge was terminated in late 2018. During the past eight monitoring events, the measured nitrate levels in well DC-07 have averaged 16.7 mg/L. This is very similar to the average nitrate concentration in the well located immediately east (well YVD-15, average nitrate concentration 19.3 mg/L) during the same time period.
- Nitrate was detected above the MCL in well DC-14 at a concentration of 57.4 mg/L. Between 2013 and June 2016, the nitrate concentrations in this well were highly variable, ranging from a low of 5.8 mg/L to a high of 26 mg/L. After a permanent pump was installed in the well prior

to the September 2016 monitoring event, the groundwater nitrate concentrations decreased to below the MCL, reaching a minimum concentration of 2.41 mg/L in June of 2017. Nitrate concentrations increased steadily quarter over quarter from September 2017 to a maximum concentration of 57.4 mg/L in Second Quarter 2022. During this same time period, groundwater elevations decreased approximately seven feet in well DC-14. Taken together, the groundwater quality and elevation data suggest that groundwater stratification and changes in groundwater elevation (relative to the fixed pump elevation) may be affecting measured groundwater nitrate concentrations in well DC-14.

EPA has not yet approved formal trend analyses procedures for use with the project. See Figures 5 through 9 for plots of observed nitrate concentrations over time in the AOC monitoring wells.

Three downgradient groundwater monitoring wells were constructed with well screens positioned at depths that were estimated by EPA to approximate the depth of a typical residential drinking water well in the area. Each of these deeper wells was paired at the same location with a water table well. The results for each well pair, with the water table well listed above its deeper counterpart, are as follows:

Well Placement	Shallow/Deep Well Pair	Nitrate (mg/L)	Shallow/Deep Well Pair	Nitrate (mg/L)	Shallow/Deep Well Pair	Nitrate (mg/L)
Shallow Well	YVD-13	36.2 J	DC-03	157	DC-05	41.7
Deep Well	YVD-18	30.9 J	DC-03D	39.1	DC-05D	9.83

Note:
J: estimated value

The results from all the well pairs show stratified conditions, with higher nitrate concentrations at the top of the water table and lower concentrations at depth. The nitrate concentrations in the YVD-13/YVD-18 well pair were approximately equal from First Quarter 2017 through Second Quarter 2019. Since Third Quarter 2019, nitrate concentrations in water table well YVD-13 have been generally increasing relative to the deeper well YVD-18. Nitrate concentrations in water table well DC-05 have historically been greater than deeper well DC-05D; the nitrate concentrations in DC-05D were below the MCL for the first time since Fourth Quarter 2015. Nitrate concentrations in water table well DC-03 remain higher than those in the paired deeper well DC-03D.

References

Anchor QEA (Anchor QEA, LLC), 2018. *Groundwater Monitoring Quality Assurance Project Plan.* Yakima Valley Dairies/SDWA-10-2013-0080. Prepared for Yakima Valley Dairies. February 2018.

EPA (U.S. Environmental Protection Agency), 2014. *National Functional Guidelines for Superfund Organic Methods Data Review.* Office of Superfund Remediation and Technology Innovation, U.S. Environmental Protection Agency, Washington, DC. EPA-540-R-014-002. August 2014.

Recipients

Adam Dolsen, Cow Palace, LLC
Dan DeRuyter, George DeRuyter & Son Dairy, LLC; D&A Dairy, LLC; George & Margaret, LLC
Henry Bosma, Liberty Dairy, LLC; H&S Bosma Dairy
Eric Winiecki, U.S. Environmental Protection Agency, Region 10
Rene Fuentes, U.S. Environmental Protection Agency, Region 10
Charles Clabaugh, U.S. Environmental Protection Agency, Region 10
Jennifer MacDonald, U.S. Environmental Protection Agency, Region 10
Meredith Weinberg, Perkins Coie LLP
Brendan Monahan, Stokes Lawrence PS
Lori Terri Gregory, Foster Pepper PLLC
Mark Larsen, Anchor QEA, LLC

Accompanying Materials

Tables

Table 1	Groundwater Monitoring Frequency
Table 2	Summary of Groundwater Elevations – Second Quarter 2022
Table 3	Monitoring Well Construction Details
Table 4	Historical Groundwater Elevations
Table 5	Estimated Possible Average Linear Groundwater Flow Velocities – Second Quarter 2022
Table 6	Field Parameter Measurements – Second Quarter 2022
Table 7	Groundwater Analytical Results – Second Quarter 2022
Table 8	Historical Groundwater Analytical Results

Figures

Figure 1	Surficial Aquifer Groundwater Elevation Contour Map Second Quarter 2022
Figure 2	Seasonal Groundwater Elevation Patterns
Figure 3	Nitrate Concentrations in Groundwater Second Quarter 2022
Figure 4	Historical Nitrate Concentrations in Groundwater
Figure 5	Nitrate Concentrations – East Downgradient Wells
Figure 6	Nitrate Concentrations – West Downgradient Wells
Figure 7	Nitrate Concentrations – Central Downgradient Wells
Figure 8	Nitrate Concentrations – Northern Downgradient Wells
Figure 9	Nitrate Concentrations – Upgradient Wells

Appendices

Appendix A Groundwater Hydrographs
Appendix B Owner Certifications
Appendix C Groundwater Sampling Records
Appendix D Data Validation Report
Appendix E Analytical Laboratory Reports

Tables

Table 1
Groundwater Monitoring Frequency

Well ID	Manual Groundwater Elevation Measurements (Quarterly)	Long-Term Groundwater Elevation Measurements (Every Quarter Hour)	Groundwater Sampling Frequency	
			Quarterly	Annually (Second Quarter Event)
DC-01	X			X
DC-03	X	X	X	X
DC-03D	X		X	X
DC-04	X		X	X
DC-05	X	X	X	X
DC-05D	X	X[3]	X	X
DC-07	X		X	X
DC-09	X			X
DC-14	X		X	X
YVD-02[2]	X		X[2]	X[2]
YVD-03	X	X[1]		X
YVD-04	X			X
YVD-05	X			X
YVD-06	X			X
YVD-07	X			X
YVD-08	X	X[1]	X	X
YVD-09	X		X	X
YVD-10	X		X	X
YVD-11	X	X[3]	X	X
YVD-12	X		X	X
YVD-13	X		X	X
YVD-14R	X		X	X
YVD-15	X		X	X
YVD-16	X		X	X
YVD-17	X			X
YVD-18	X		X	X

Note:
1. These wells currently do not have installed transducers. The transducers in these two wells fell down the wells on December 14, 2021, and have not been recovered or replaced.
2. YVD-02 has been dry since Second Quarter 2020 and cannot currently be sampled.
3. These wells currently do not have installed transducers. The transducers in these two wells would not connect to the downloading device and were sent to the manufacturer for data extraction. The transducers have not been replaced in the wells.

Table 2
Summary of Groundwater Elevations – Second Quarter 2022

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
DC-01	6/5/2022	1199.17	150.84	1048.33
DC-03	6/5/2022	910.58	76.44	834.14
DC-03D	6/5/2022	911.33	77.11	834.22
DC-04	6/5/2022	877.22	39.47	837.75
DC-05	6/5/2022	911.95	74.21	837.74
DC-05D	6/5/2022	915.91	77.36	838.55
DC-07	6/5/2022	889.29	49.25	840.04
DC-09	6/5/2022	1048.60	164.10	884.50
DC-14	6/5/2022	1036.61	139.03	897.58
YVD-02	6/5/2022	1288.97	dry	---
YVD-03	6/5/2022	1120.68	196.15	924.53
YVD-04	6/5/2022	1118.66	227.54	891.12
YVD-05	6/5/2022	1051.78	174.32	877.46
YVD-06	6/5/2022	1053.51	111.01	942.50
YVD-07	6/5/2022	1073.03	159.47	913.56
YVD-08	6/5/2022	1014.38	174.85	839.53
YVD-09	6/5/2022	966.81	114.70	852.11
YVD-10	6/5/2022	958.00	95.62	862.38
YVD-11	6/5/2022	967.91	112.49	855.42
YVD-12	6/5/2022	961.91	141.39	820.52
YVD-13	6/5/2022	965.59	130.57	835.02
YVD-14R	6/5/2022	921.41	82.01	839.40
YVD-15	6/5/2022	940.61	97.51	843.10
YVD-16	6/5/2022	975.90	119.79	856.11
YVD-17	6/5/2022	866.73	38.57	828.16
YVD-18	6/5/2022	965.74	130.74	835.00

Notes:

---: not available or not applicable

BTOC: below top of casing

NAVD88: North American Vertical Datum of 1988

Table 3
Monitoring Well Construction Details

Well ID	Coordinates		Top of Casing Elevation (feet NAVD88)	Ground Surface Elevation (feet NAVD88)	Surface Completion	Well Depth (feet bgs)	Casing and Screen Material	Screen Slot Size (inches)	Screen Length (feet)	Depth to Top of Screen (feet bgs)	Depth to Bottom of Screen (feet bgs)	Elevation of Top of Screen (feet NAVD88)	Elevation of Base of Screen (feet NAVD88)	Depth to Top of Filter Pack (feet bgs)	Depth to Bottom of Filter Pack (feet bgs)
	Latitude	Longitude													
Monitoring Wells															
DC-01	46.418795	-120.138185	1199.17	1199.64	Flush	160.0	Schedule 40 PVC	0.020	20.0	140.0	160.0	1059.6	1039.6	136.0	160.0
DC-03	46.386289	-120.146145	910.58	911.04	Flush	85.0	Schedule 40 PVC	0.020	20.0	62.5	82.5	848.5	828.5	58.5	85.0
DC-03D	46.386220	-120.146054	911.33	908.83	Stick-up	116.1	Schedule 40 PVC	0.020	9.5	106.1	115.6	802.7	793.2	100.0	116.5
DC-04	46.382446	-120.131129	877.22	877.62	Flush	51.0	Schedule 40 PVC	0.020	20.0	29.5	49.5	848.1	828.1	24.5	51.0
DC-05	46.382358	-120.120237	911.95	912.35	Flush	86.0	Schedule 40 PVC	0.020	20.0	63.5	83.5	848.9	828.9	59.5	86.0
DC-05D	46.382517	-120.120210	915.91	913.55	Stick-up	126.8	Schedule 40 PVC	0.020	9.5	116.8	126.3	796.8	787.3	114.0	128.0
DC-07	46.389612	-120.141671	889.29	889.78	Flush	61.0	Schedule 40 PVC	0.020	20.0	38.5	58.5	851.3	831.3	34.5	61.0
DC-09	46.404230	-120.120858	1048.60	1048.97	Flush	196.0	Schedule 40 PVC	0.020	20.0	173.5	193.5	875.5	855.5	169.5	196.0
DC-14	46.404240	-120.139685	1036.61	1036.92	Flush	151.0	Schedule 40 PVC	0.020	20.0	128.5	148.5	908.4	888.4	124.5	151.0
YVD-02	46.422601	-120.113697	1288.97	1285.81	Stick-up	35.0	Schedule 40 PVC	0.020	19.5	15.0	34.5	1270.8	1251.3	13.0	36.0
YVD-03	46.414227	-120.139638	1120.68	1118.15	Stick-up	200.1	Schedule 40 PVC	0.020	19.5	180.1	199.6	938.1	918.6	176.0	202.0
YVD-04	46.408062	-120.156224	1118.66	1116.06	Stick-up	245.2	Schedule 40 PVC	0.020	19.5	225.2	244.7	890.9	871.4	220.0	248.0
YVD-05	46.404457	-120.142790	1051.78	1052.26	Flush	182.2	Schedule 40 PVC	0.020	19.5	162.2	181.7	890.1	870.6	156.0	208.0
YVD-06	46.407671	-120.137191	1053.51	1053.88	Flush	169.0	Schedule 40 PVC	0.020	19.5	149.0	168.5	904.9	885.4	144.0	170.0
YVD-07	46.404432	-120.125205	1073.03	1070.59	Stick-up	168.3	Schedule 40 PVC	0.020	19.5	148.3	167.8	922.3	902.8	145.0	169.0
YVD-08	46.396920	-120.152771	1014.38	1011.92	Stick-up	182.5	Schedule 40 PVC	0.020	19.5	162.5	182.0	849.4	829.9	155.0	188.0
YVD-09	46.396832	-120.144078	966.81	964.28	Stick-up	122.3	Schedule 40 PVC	0.020	19.5	102.3	121.8	862.0	842.5	9.5	128.0
YVD-10	46.396978	-120.136165	958.00	955.45	Stick-up	103.1	Schedule 40 PVC	0.020	19.5	83.1	102.6	872.4	852.9	76.0	103.5
YVD-11	46.393446	-120.123627	967.91	965.51	Stick-up	116.9	Schedule 40 PVC	0.020	19.5	96.9	116.4	868.6	849.1	94.0	117.3
YVD-12	46.389730	-120.166996	961.91	959.51	Stick-up	151.4	Schedule 40 PVC	0.020	19.5	131.4	150.9	828.1	808.6	127.0	154.0
YVD-13	46.389708	-120.151673	965.59	963.07	Stick-up	141.0	Schedule 40 PVC	0.020	19.5	121.0	140.5	842.1	822.6	117.0	148.0
YVD-14R	46.389532	-120.145124	920.19	918.80	Stick-up	93.0	Schedule 40 PVC	0.020	20.0	72.0	92.0	846.8	826.8	69.0	93.0
YVD-15	46.389802	-120.137153	940.61	938.08	Stick-up	105.1	Schedule 40 PVC	0.020	19.5	85.1	104.6	853.0	833.5	81.0	128.0
YVD-16	46.389586	-120.114783	975.90	972.99	Stick-up	122.1	Schedule 40 PVC	0.020	19.5	102.1	121.6	870.9	851.4	100.5	127.0
YVD-17	46.380761	-120.142067	866.73	864.28	Stick-up	47.7	Schedule 40 PVC	0.020	19.5	27.7	47.2	836.6	817.1	25.0	58.0
YVD-18	46.389758	-120.151671	965.74	963.42	Stick-up	179.9	Schedule 40 PVC	0.020	9.5	169.9	179.4	793.5	784.0	166.0	181.5
Decommissioned Wells															
YVD-14	46.389536	-120.145067	920.19	917.64	Stick-up	91.0	Schedule 40 PVC	0.020	19.5	71.0	90.5	846.6	827.1	66.0	98.0

Notes:
Latitude and longitude in decimal degrees based on World Geodetic Survey 1984.
bgs: below ground surface
NAVD88: North American Vertical Datum of 1988
PVC: polyvinyl chloride

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
DC-01	9/16/2013	1199.17	150.45	1048.72
DC-01	12/9/2013	1199.17	150.66	1048.51
DC-01	3/16/2014	1199.17	150.43	1048.74
DC-01	6/1/2014	1199.17	150.50	1048.67
DC-01	9/21/2014	1199.17	150.32	1048.85
DC-01	12/14/2014	1199.17	150.20	1048.97
DC-01	3/5/2015	1199.17	150.35	1048.82
DC-01	6/15/2015	1199.17	150.41	1048.76
DC-01	9/21/2015	1199.17	150.50	1048.67
DC-01	12/13/2015	1199.17	150.46	1048.71
DC-01	3/8/2016	1199.17	150.53	1048.64
DC-01	6/19/2016	1199.17	150.70	1048.47
DC-01	9/25/2016	1199.17	150.70	1048.47
DC-01	12/11/2016	1199.17	150.65	1048.52
DC-01	3/5/2017	1199.17	150.55	1048.62
DC-01	6/4/2017	1199.17	150.68	1048.49
DC-01	9/27/2017	1199.17	150.81	1048.36
DC-01	12/3/2017	1199.17	150.74	1048.43
DC-01	3/18/2018	1199.17	150.74	1048.43
DC-01	6/3/2018	1199.17	150.74	1048.43
DC-01	9/8/2018	1199.17	150.44	1048.73
DC-01	12/9/2018	1199.17	150.94	1048.23
DC-01	3/21/2019	1199.17	150.78	1048.39
DC-01	6/1/2019	1199.17	150.85	1048.32
DC-01	9/8/2019	1199.17	150.77	1048.40
DC-01	12/8/2019	1199.17	150.79	1048.38
DC-01	3/29/2020	1199.17	150.74	1048.43
DC-01	6/7/2020	1199.17	150.87	1048.30
DC-01	9/20/2020	1199.17	150.97	1048.20
DC-01	12/6/2020	1199.17	151.06	1048.11
DC-01	2/28/2021	1199.17	150.99	1048.18
DC-01	6/6/2021	1199.17	150.86	1048.31
DC-01	9/20/2021	1199.17	151.13	1048.04
DC-01	12/14/2021	1199.17	150.85	1048.32
DC-01	3/14/2022	1199.17	150.95	1048.22
DC-01	6/5/2022	1199.17	150.84	1048.33
DC-03	9/16/2013	910.58	72.43	838.15
DC-03	12/9/2013	910.58	72.55	838.03
DC-03	3/16/2014	910.58	73.62	836.96
DC-03	6/1/2014	910.58	73.25	837.33
DC-03	9/21/2014	910.58	72.26	838.32
DC-03	12/14/2014	910.58	72.40	838.18
DC-03	3/5/2015	910.58	73.60	836.98
DC-03	6/15/2015	910.58	73.12	837.46
DC-03	9/21/2015	910.58	72.35	838.23
DC-03	12/13/2015	910.58	73.64	837.94
DC-03	3/8/2016	910.58	73.99	836.59
DC-03	6/19/2016	910.58	73.84	836.74
DC-03	9/25/2016	910.58	72.87	837.71
DC-03	12/11/2016	910.58	72.93	837.65
DC-03	3/5/2017	910.58	74.20	836.38
DC-03	6/4/2017	910.58	74.21	836.37
DC-03	9/27/2017	910.58	72.81	837.77
DC-03	12/3/2017	910.58	73.11	837.47
DC-03	3/18/2018	910.58	74.54	836.04
DC-03	6/3/2018	910.58	74.08	836.50
DC-03	9/8/2018	910.58	73.24	837.34
DC-03	12/9/2018	910.58	73.32	837.26
DC-03	3/21/2019	910.58	75.01	835.57
DC-03	6/1/2019	910.58	74.94	835.64
DC-03	9/8/2019	910.58	73.95	836.63
DC-03	12/8/2019	910.58	74.10	836.48
DC-03	3/29/2020	910.58	75.90	834.68
DC-03	6/7/2020	910.58	75.52	835.06
DC-03	9/20/2020	910.58	74.46	836.12
DC-03	12/6/2020	910.58	74.56	836.02
DC-03	2/28/2021	910.58	75.94	834.64
DC-03	6/6/2021	910.58	75.89	834.69
DC-03	9/20/2021	910.58	74.90	835.68
DC-03	12/14/2021	910.58	75.22	835.36

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
DC-03	3/14/2022	910.58	76.71	833.87
DC-03	6/5/2022	910.58	76.44	834.14
DC-03D	9/16/2013	911.33	73.03	838.30
DC-03D	12/9/2013	911.33	73.16	838.17
DC-03D	3/16/2014	911.33	74.35	836.98
DC-03D	6/1/2014	911.33	73.90	837.43
DC-03D	9/21/2014	911.33	72.87	838.46
DC-03D	12/14/2014	911.33	73.13	838.20
DC-03D	3/5/2015	911.33	74.28	837.05
DC-03D	6/15/2015	911.33	73.72	837.61
DC-03D	9/21/2015	911.33	72.96	838.37
DC-03D	12/13/2015	911.33	73.31	838.02
DC-03D	3/8/2016	911.33	74.66	836.67
DC-03D	6/19/2016	911.33	74.47	836.86
DC-03D	9/25/2016	911.33	73.44	837.89
DC-03D	12/11/2016	911.33	73.73	837.60
DC-03D	3/5/2017	911.33	75.05	836.28
DC-03D	6/4/2017	911.33	74.88	836.45
DC-03D	9/27/2017	911.33	73.42	837.91
DC-03D	12/3/2017	911.33	73.80	837.53
DC-03D	3/18/2018	911.33	75.30	836.03
DC-03D	6/3/2018	911.33	74.82	836.51
DC-03D	9/8/2018	911.33	73.78	837.55
DC-03D	12/9/2018	911.33	74.01	837.32
DC-03D	3/21/2019	911.33	75.75	835.58
DC-03D	6/1/2019	911.33	75.65	835.68
DC-03D	9/8/2019	911.33	74.55	836.78
DC-03D	12/8/2019	911.33	74.79	836.54
DC-03D	3/29/2020	911.33	76.49	834.84
DC-03D	6/7/2020	911.33	76.19	835.14
DC-03D	9/20/2020	911.33	75.06	836.27
DC-03D	12/6/2020	911.33	75.24	836.09
DC-03D	2/28/2021	911.33	76.66	834.67
DC-03D	6/6/2021	911.33	76.57	834.76
DC-03D	9/20/2021	911.33	75.53	835.80
DC-03D	12/14/2021	911.33	75.88	835.45
DC-03D	3/14/2022	911.33	77.42	833.91
DC-03D	6/5/2022	911.33	77.11	834.22
DC-04	9/16/2013	877.22	31.75	845.47
DC-04	12/9/2013	877.22	32.61	844.61
DC-04	3/16/2014	877.22	34.55	842.67
DC-04	6/1/2014	877.22	34.65	842.57
DC-04	9/21/2014	877.22	31.99	845.23
DC-04	12/14/2014	877.22	32.98	844.24
DC-04	3/5/2015	877.22	34.31	842.91
DC-04	6/15/2015	877.22	34.70	842.52
DC-04	9/21/2015	877.22	33.61	843.61
DC-04	12/13/2015	877.22	34.38	842.84
DC-04	3/8/2016	877.22	35.60	841.62
DC-04	6/19/2016	877.22	34.74	842.48
DC-04	9/25/2016	877.22	33.81	843.41
DC-04	12/11/2016	877.22	34.33	842.89
DC-04	3/5/2017	877.22	35.45	841.77
DC-04	6/4/2017	877.22	35.63	841.59
DC-04	9/27/2017	877.22	34.42	842.80
DC-04	12/3/2017	877.22	35.17	842.05
DC-04	3/18/2018	877.22	36.89	840.33
DC-04	6/3/2018	877.22	37.17	840.05
DC-04	9/8/2018	877.22	36.45	840.77
DC-04	12/9/2018	877.22	36.17	841.05
DC-04	3/21/2019	877.22	37.73	839.49
DC-04	6/1/2019	877.22	38.20	839.02
DC-04	9/8/2019	877.22	36.96	840.26
DC-04	12/8/2019	877.22	36.83	840.39
DC-04	3/29/2020	877.22	38.37	838.85
DC-04	6/7/2020	877.22	38.58	838.64
DC-04	9/20/2020	877.22	37.23	839.99
DC-04	12/6/2020	877.22	36.76	840.46
DC-04	2/28/2021	877.22	38.35	838.87

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
DC-04	6/6/2021	877.22	39.12	838.10
DC-04	9/20/2021	877.22	38.19	839.03
DC-04	12/14/2021	877.22	37.91	839.31
DC-04	3/14/2022	877.22	39.32	837.90
DC-04	6/5/2022	877.22	39.47	837.75
DC-05	9/16/2013	911.95	67.78	844.17
DC-05	12/9/2013	911.95	68.28	843.67
DC-05	3/16/2014	911.95	69.25	842.70
DC-05	6/1/2014	911.95	70.15	841.80
DC-05	9/21/2014	911.95	69.43	842.52
DC-05	12/14/2014	911.95	68.80	843.15
DC-05	3/5/2015	911.95	69.33	842.62
DC-05	6/15/2015	911.95	70.28	841.67
DC-05	9/21/2015	911.95	69.94	842.01
DC-05	12/13/2015	911.95	69.59	842.36
DC-05	3/8/2016	911.95	70.58	841.37
DC-05	6/19/2016	911.95	71.43	840.52
DC-05	9/25/2016	911.95	71.08	840.87
DC-05	12/11/2016	911.95	70.24	841.71
DC-05	3/5/2017	911.95	70.98	840.97
DC-05	6/4/2017	911.95	71.81	840.14
DC-05	9/27/2017	911.95	71.14	840.81
DC-05	12/3/2017	911.95	70.50	841.45
DC-05	3/18/2018	911.95	71.06	840.89
DC-05	6/3/2018	911.95	71.33	840.62
DC-05	9/8/2018	911.95	71.39	840.56
DC-05	12/9/2018	911.95	70.82	841.13
DC-05	3/21/2019	911.95	71.46	840.49
DC-05	6/1/2019	911.95	71.95	840.00
DC-05	9/8/2019	911.95	72.09	839.86
DC-05	12/8/2019	911.95	71.47	840.48
DC-05	3/29/2020	911.95	72.43	839.52
DC-05	6/7/2020	911.95	73.11	838.84
DC-05	9/20/2020	911.95	73.38	838.57
DC-05	12/6/2020	911.95	73.03	838.92
DC-05	2/28/2021	911.95	73.97	837.98
DC-05	6/6/2021	911.95	74.88	837.07
DC-05	9/20/2021	911.95	74.92	837.03
DC-05	12/14/2021	911.95	74.08	837.87
DC-05	3/14/2022	911.95	74.52	837.43
DC-05	6/5/2022	911.95	74.21	837.74
DC-05D	9/16/2013	915.91	71.92	843.99
DC-05D	12/9/2013	915.91	72.04	843.87
DC-05D	3/16/2014	915.91	73.83	842.08
DC-05D	6/1/2014	915.91	74.80	841.11
DC-05D	9/21/2014	915.91	73.78	842.13
DC-05D	12/14/2014	915.91	73.02	842.89
DC-05D	3/5/2015	915.91	73.66	842.25
DC-05D	6/15/2015	915.91	74.71	841.20
DC-05D	9/21/2015	915.91	74.38	841.53
DC-05D	12/13/2015	915.91	73.88	842.03
DC-05D	3/8/2016	915.91	74.70	841.21
DC-05D	6/19/2016	915.91	75.71	840.20
DC-05D	9/25/2016	915.91	75.40	840.51
DC-05D	12/11/2016	915.91	74.65	841.26
DC-05D	3/5/2017	915.91	74.96	840.95
DC-05D	6/4/2017	915.91	75.94	839.97
DC-05D	9/27/2017	915.91	75.47	840.44
DC-05D	12/3/2017	915.91	74.64	841.27
DC-05D	3/18/2018	915.91	75.43	840.48
DC-05D	6/3/2018	915.91	75.46	840.45
DC-05D	9/8/2018	915.91	75.54	840.37
DC-05D	12/9/2018	915.91	75.00	840.91
DC-05D	3/21/2019	915.91	75.30	840.61
DC-05D	6/1/2019	915.91	76.26	839.65
DC-05D	9/8/2019	915.91	76.17	839.74
DC-05D	12/8/2019	915.91	75.37	840.54
DC-05D	3/29/2020	915.91	76.38	839.53
DC-05D	6/7/2020	915.91	77.36	838.55

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
DC-05D	9/20/2020	915.91	77.85	838.06
DC-05D	12/6/2020	915.91	77.21	838.70
DC-05D	2/28/2021	915.91	78.68	837.23
DC-05D	6/6/2021	915.91	79.28	836.63
DC-05D	9/20/2021	915.91	79.44	836.47
DC-05D	12/14/2021	915.91	78.26	837.65
DC-05D	3/14/2022	915.91	78.28	837.63
DC-05D	6/5/2022	915.91	77.36	838.55
DC-07	9/16/2013	889.29	44.76	844.53
DC-07	12/9/2013	889.29	44.15	845.14
DC-07	3/16/2014	889.29	44.76	844.53
DC-07	6/1/2014	889.29	35.121	
DC-07	9/21/2014	889.29	44.59	844.70
DC-07	12/14/2014	889.29	44.13	845.16
DC-07	3/5/2015	889.29	44.90	844.39
DC-07	6/15/2015	889.29	45.30	843.99
DC-07	9/21/2015	889.29	45.08	844.21
DC-07	12/13/2015	889.29	44.65	844.64
DC-07	3/8/2016	889.29	45.50	843.79
DC-07	6/19/2016	889.29	46.16	843.13
DC-07	9/25/2016	889.29	45.69	843.60
DC-07	12/11/2016	889.29	45.61	843.68
DC-07	3/5/2017	889.29	46.27	843.02
DC-07	6/4/2017	889.29	46.54	842.75
DC-07	9/27/2017	889.29	46.11	843.18
DC-07	12/3/2017	889.29	45.73	843.56
DC-07	3/18/2018	889.29	46.45	842.84
DC-07	6/3/2018	889.29	46.76	842.53
DC-07	9/8/2018	889.29	46.32	842.97
DC-07	12/9/2018	889.29	46.09	843.20
DC-07	3/21/2019	889.29	46.94	842.35
DC-07	6/1/2019	889.29	47.36	841.93
DC-07	9/8/2019	889.29	46.79	842.50
DC-07	12/8/2019	889.29	46.68	842.61
DC-07	3/29/2020	889.29	47.65	841.64
DC-07	6/7/2020	889.29	48.04	841.25
DC-07	7/13/2020	889.29	48.06	841.23
DC-07	9/20/2020	889.29	47.80	841.49
DC-07	12/6/2020	889.29	47.51	841.78
DC-07	2/28/2021	889.29	48.12	841.17
DC-07	6/6/2021	889.29	48.69	840.60
DC-07	9/20/2021	889.29	48.17	841.12
DC-07	12/14/2021	889.29	48.05	841.24
DC-07	3/14/2022	889.29	48.81	840.48
DC-07	6/5/2022	889.29	49.25	840.04
DC-09	9/16/2013	1048.60	147.16	901.44
DC-09	12/9/2013	1048.60	143.10	905.50
DC-09	3/16/2014	1048.60	139.81	908.79
DC-09	6/1/2014	1048.60	142.53	906.07
DC-09	9/21/2014	1048.60	143.67	904.93
DC-09	12/14/2014	1048.60	139.42	909.18
DC-09	3/5/2015	1048.60	137.83	910.77
DC-09	6/15/2015	1048.60	146.33	902.27
DC-09	9/21/2015	1048.60	151.28	897.32
DC-09	12/13/2015	1048.60	147.46	901.14
DC-09	3/8/2016	1048.60	146.70	901.90
DC-09	6/19/2016	1048.60	151.03	897.57
DC-09	9/25/2016	1048.60	151.98	896.62
DC-09	12/11/2016	1048.60	148.71	899.89
DC-09	3/5/2017	1048.60	146.24	902.36
DC-09	6/4/2017	1048.60	148.62	899.98
DC-09	9/27/2017	1048.60	151.56	897.04
DC-09	12/3/2017	1048.60	149.27	899.33
DC-09	3/18/2018	1048.60	146.19	902.41
DC-09	6/3/2018	1048.60	149.27	899.33
DC-09	9/8/2018	1048.60	151.66	896.94
DC-09	12/9/2018	1048.60	149.99	898.61
DC-09	3/21/2019	1048.60	148.87	899.73
DC-09	6/1/2019	1048.60	151.32	897.28

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
DC-09	9/8/2019	1048.60	155.69	892.91
DC-09	12/8/2019	1048.60	155.23	893.37
DC-09	3/29/2020	1048.60	156.53	892.07
DC-09	6/7/2020	1048.60	157.91	890.69
DC-09	9/20/2020	1048.60	161.02	887.58
DC-09	12/6/2020	1048.60	160.56	888.04
DC-09	2/28/2021	1048.60	159.29	889.31
DC-09	6/6/2021	1048.60	161.68	886.92
DC-09	9/20/2021	1048.60	164.74	883.86
DC-09	12/14/2021	1048.60	163.15	885.45
DC-09	3/14/2022	1048.60	162.89	885.71
DC-09	6/5/2022	1048.60	164.10	884.50
DC-14	9/16/2013	1036.61	131.08	905.53
DC-14	12/9/2013	1036.61	131.10	905.51
DC-14	3/16/2014	1036.61	130.32	906.29
DC-14	6/1/2014	1036.61	130.02	906.59
DC-14	9/21/2014	1036.61	130.25	906.36
DC-14	12/14/2014	1036.61	137.911	
DC-14	3/5/2015	1036.61	129.51	907.10
DC-14	6/15/2015	1036.61	129.37	907.24
DC-14	9/21/2015	1036.61	130.28	906.33
DC-14	12/13/2015	1036.61	130.71	905.90
DC-14	3/8/2016	1036.61	131.26	905.35
DC-14	6/19/2016	1036.61	131.89	904.72
DC-14	9/25/2016	1036.61	132.76	903.85
DC-14	12/11/2016	1036.61	133.45	903.16
DC-14	3/5/2017	1036.61	133.81	902.80
DC-14	6/4/2017	1036.61	133.81	902.80
DC-14	9/27/2017	1036.61	134.16	902.45
DC-14	12/3/2017	1036.61	134.48	902.13
DC-14	3/18/2018	1036.61	133.83	902.78
DC-14	6/3/2018	1036.61	133.35	903.26
DC-14	9/8/2018	1036.61	133.67	902.94
DC-14	12/9/2018	1036.61	133.67	902.94
DC-14	3/21/2019	1036.61	133.24	903.37
DC-14	6/1/2019	1036.61	132.98	903.63
DC-14	9/8/2019	1036.61	133.72	902.89
DC-14	12/8/2019	1036.61	134.60	902.01
DC-14	3/29/2020	1036.61	135.10	901.51
DC-14	6/7/2020	1036.61	135.56	901.05
DC-14	9/20/2020	1036.61	136.54	900.07
DC-14	12/6/2020	1036.61	137.45	899.16
DC-14	2/28/2021	1036.61	138.02	898.59
DC-14	6/6/2021	1036.61	138.28	898.33
DC-14	9/20/2021	1036.61	139.06	897.55
DC-14	12/14/2021	1036.61	139.58	897.03
DC-14	3/14/2022	1036.61	139.27	897.34
DC-14	6/5/2022	1036.61	139.03	897.58
YVD-02	9/16/2013	1288.97	24.21	1264.76
YVD-02	12/9/2013	1288.97	32.85	1256.12
YVD-02	3/16/2014	1288.97	34.45	1254.52
YVD-02	6/1/2014	1288.97	22.10	1266.87
YVD-02	9/21/2014	1288.97	26.14	1262.83
YVD-02	12/14/2014	1288.97	33.01	1255.96
YVD-02	3/5/2015	1288.97	34.42	1254.55
YVD-02	6/15/2015	1288.97	19.69	1269.28
YVD-02	9/21/2015	1288.97	25.36	1263.61
YVD-02	12/13/2015	1288.97	33.25	1255.72
YVD-02	3/8/2016	1288.97	33.93	1255.04
YVD-02	6/19/2016	1288.97	27.49	1261.48
YVD-02	9/25/2016	1288.97	27.72	1261.25
YVD-02	12/11/2016	1288.97	32.52	1256.45
YVD-02	3/5/2017	1288.97	27.34	1261.63
YVD-02	6/4/2017	1288.97	26.97	1262.00
YVD-02	9/27/2017	1288.97	28.08	1260.89
YVD-02	12/3/2017	1288.97	33.83	1255.14
YVD-02	3/18/2018	1288.97	34.07	1254.90
YVD-02	6/3/2018	1288.97	33.78	1255.19
YVD-02	9/8/2018	1288.97	29.19	1259.78

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-02	12/9/2018	1288.97	33.17	1255.8
YVD-02	3/21/2019	1288.97	34.44	1254.53
YVD-02	6/1/2019	1288.97	30.68	1258.29
YVD-02	9/8/2019	1288.97	32.34	1256.63
YVD-02	12/8/2019	1288.97	33.92	1255.05
YVD-02	3/29/2020	1288.97	35.49	1253.48
YVD-02	6/7/2020	1288.97	37.44	1251.53
YVD-02	7/13/2020	1288.97	37.68	1251.29
YVD-02	9/19/2020	1288.97	37.94	1251.03
YVD-02	12/6/2020	1288.97	dry	
YVD-02	2/28/2021	1288.97	37.93	1251.04
YVD-02	6/6/2021	1288.97	dry	
YVD-02	9/20/2021	1288.97	dry	
YVD-02	12/14/2021	1288.97	dry	
YVD-02	3/14/2022	1288.97	dry	
YVD-02	6/5/2022	1288.97	dry	
YVD-03	9/16/2013	1120.68	189.88	930.80
YVD-03	12/9/2013	1120.68	190.42	930.26
YVD-03	3/16/2014	1120.68	189.10	931.58
YVD-03	6/1/2014	1120.68	188.97	931.71
YVD-03	9/21/2014	1120.68	189.04	931.64
YVD-03	12/14/2014	1120.68	188.73	931.95
YVD-03	3/5/2015	1120.68	187.92	932.76
YVD-03	6/15/2015	1120.68	188.70	931.98
YVD-03	9/21/2015	1120.68	189.63	931.05
YVD-03	12/13/2015	1120.68	189.85	930.83
YVD-03	3/8/2016	1120.68	190.64	930.04
YVD-03	6/19/2016	1120.68	191.31	929.37
YVD-03	9/25/2016	1120.68	191.61	929.07
YVD-03	12/11/2016	1120.68	191.25	929.43
YVD-03	3/5/2017	1120.68	190.85	929.83
YVD-03	6/4/2017	1120.68	191.20	929.48
YVD-03	9/27/2017	1120.68	191.77	928.91
YVD-03	12/3/2017	1120.68	191.61	929.07
YVD-03	3/18/2018	1120.68	191.55	929.13
YVD-03	6/3/2018	1120.68	191.4	929.28
YVD-03	9/8/2018	1120.68	191.96	928.72
YVD-03	12/9/2018	1120.68	192.59	928.09
YVD-03	3/21/2019	1120.68	191.86	928.82
YVD-03	6/1/2019	1120.68	191.85	928.83
YVD-03	9/8/2019	1120.68	192.53	928.15
YVD-03	12/8/2019	1120.68	193.62	927.06
YVD-03	3/29/2020	1120.68	193.93	926.75
YVD-03	6/7/2020	1120.68	194.17	926.51
YVD-03	9/20/2020	1120.68	195.07	925.61
YVD-03	11/19/2020	1120.68	195.78	924.90
YVD-03	12/6/2020	1120.68	195.75	924.93
YVD-03	2/28/2021	1120.68	195.80	924.88
YVD-03	6/6/2021	1120.68	195.50	925.18
YVD-03	9/20/2021	1120.68	196.18	924.50
YVD-03	12/14/2021	1120.68	195.94	924.74
YVD-03	3/14/2022	1120.68	196.42	924.26
YVD-03	6/5/2022	1120.68	196.15	924.53
YVD-04	9/16/2013	1118.66	220.55	898.11
YVD-04	12/9/2013	1118.66	223.50	895.16
YVD-04	3/16/2014	1118.66	222.20	896.46
YVD-04	6/1/2014	1118.66	221.04	897.62
YVD-04	9/21/2014	1118.66	220.67	897.99
YVD-04	12/14/2014	1118.66	221.30	897.36
YVD-04	3/5/2015	1118.66	220.72	897.94
YVD-04	6/15/2015	1118.66	221.61	897.05
YVD-04	9/21/2015	1118.66	221.99	896.67
YVD-04	12/13/2015	1118.66	221.71	896.95
YVD-04	3/8/2016	1118.66	220.74	897.92
YVD-04	6/19/2016	1118.66	221.50	897.16
YVD-04	9/25/2016	1118.66	221.05	897.61
YVD-04	12/11/2016	1118.66	221.07	897.59
YVD-04	3/5/2017	1118.66	220.89	897.77
YVD-04	6/4/2017	1118.66	221.83	896.83

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-04	9/27/2017	1118.66	222.49	896.17
YVD-04	12/3/2017	1118.66	222.38	896.28
YVD-04	3/18/2018	1118.66	222.37	896.29
YVD-04	6/3/2018	1118.66	222.04	896.62
YVD-04	9/8/2018	1118.66	222.29	896.37
YVD-04	12/9/2018	1118.66	222.36	896.30
YVD-04	3/21/2019	1118.66	221.67	896.99
YVD-04	6/1/2019	1118.66	221.71	896.95
YVD-04	9/8/2019	1118.66	222.06	896.60
YVD-04	12/8/2019	1118.66	222.31	896.35
YVD-04	3/29/2020	1118.66	222.47	896.19
YVD-04	6/7/2020	1118.66	222.76	895.90
YVD-04	9/20/2020	1118.66	223.52	895.14
YVD-04	12/6/2020	1118.66	224.24	894.42
YVD-04	2/28/2021	1118.66	224.39	894.27
YVD-04	6/6/2021	1118.66	224.48	894.18
YVD-04	9/20/2021	1118.66	225.71	892.95
YVD-04	12/14/2021	1118.66	225.63	893.03
YVD-04	3/14/2022	1118.66	226.81	891.85
YVD-04	6/5/2022	1118.66	227.54	891.12
YVD-05	9/16/2013	1051.78	167.50	884.28
YVD-05	12/9/2013	1051.78	166.35	885.43
YVD-05	3/16/2014	1051.78	165.40	886.38
YVD-05	6/1/2014	1051.78	165.58	886.20
YVD-05	9/21/2014	1051.78	166.01	885.77
YVD-05	12/14/2014	1051.78	165.35	886.43
YVD-05	3/5/2015	1051.78	164.86	886.92
YVD-05	6/15/2015	1051.78	166.04	885.74
YVD-05	9/21/2015	1051.78	168.04	883.74
YVD-05	12/13/2015	1051.78	167.75	884.03
YVD-05	3/8/2016	1051.78	167.71	884.07
YVD-05	6/19/2016	1051.78	168.45	883.33
YVD-05	9/25/2016	1051.78	168.97	882.81
YVD-05	12/11/2016	1051.78	168.51	883.27
YVD-05	3/5/2017	1051.78	167.98	883.80
YVD-05	6/4/2017	1051.78	168.07	883.71
YVD-05	9/27/2017	1051.78	169.83	881.95
YVD-05	12/3/2017	1051.78	169.67	882.11
YVD-05	3/18/2018	1051.78	169.38	882.40
YVD-05	6/3/2018	1051.78	169.45	882.33
YVD-05	9/8/2018	1051.78	169.85	881.93
YVD-05	12/9/2018	1051.78	169.44	882.34
YVD-05	3/21/2019	1051.78	168.86	882.92
YVD-05	6/1/2019	1051.78	169.06	882.72
YVD-05	9/8/2019	1051.78	170.22	881.56
YVD-05	12/8/2019	1051.78	170.62	881.16
YVD-05	3/29/2020	1051.78	171.06	880.72
YVD-05	6/7/2020	1051.78	171.58	880.20
YVD-05	9/20/2020	1051.78	172.53	879.25
YVD-05	12/6/2020	1051.78	172.95	878.83
YVD-05	2/28/2021	1051.78	173.05	878.73
YVD-05	6/6/2021	1051.78	173.39	878.39
YVD-05	9/20/2021	1051.78	NM2	
YVD-05	12/14/2021	1051.78	174.20	877.58
YVD-05	3/14/2022	1051.78	174.19	877.59
YVD-05	6/5/2022	1051.78	174.32	877.46
YVD-06	9/16/2013	1053.51	110.65	942.86
YVD-06	12/9/2013	1053.51	108.21	945.30
YVD-06	3/16/2014	1053.51	105.98	947.53
YVD-06	6/1/2014	1053.51	106.49	947.02
YVD-06	9/21/2014	1053.51	108.02	945.49
YVD-06	12/14/2014	1053.51	106.32	947.19
YVD-06	3/5/2015	1053.51	104.68	948.83
YVD-06	6/15/2015	1053.51	106.37	947.14
YVD-06	9/21/2015	1053.51	109.01	944.50
YVD-06	12/13/2015	1053.51	108.72	944.79
YVD-06	3/8/2016	1053.51	108.90	944.61
YVD-06	6/19/2016	1053.51	111.03	942.48
YVD-06	9/25/2016	1053.51	112.05	941.46

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-06	12/15/2016	1053.51	109.70	943.81
YVD-06	3/5/2017	1053.51	107.89	945.62
YVD-06	6/4/2017	1053.51	109.14	944.37
YVD-06	9/27/2017	1053.51	110.99	942.52
YVD-06	12/3/2017	1053.51	109.30	944.21
YVD-06	3/18/2018	1053.51	106.37	947.14
YVD-06	6/3/2018	1053.51	108.02	945.49
YVD-06	9/8/2018	1053.51	109.87	943.64
YVD-06	12/9/2018	1053.51	107.99	945.52
YVD-06	3/21/2019	1053.51	106.86	946.65
YVD-06	6/1/2019	1053.51	108.32	945.19
YVD-06	9/8/2019	1053.51	110.95	942.56
YVD-06	12/8/2019	1053.51	111.11	942.40
YVD-06	3/29/2020	1053.51	110.92	942.59
YVD-06	6/7/2020	1053.51	112.14	941.37
YVD-06	9/20/2020	1053.51	113.89	939.62
YVD-06	12/6/2020	1053.51	113.00	940.51
YVD-06	2/28/2021	1053.51	111.71	941.80
YVD-06	6/6/2021	1053.51	112.36	941.15
YVD-06	9/20/2021	1053.51	113.89	939.62
YVD-06	12/14/2021	1053.51	111.58	941.93
YVD-06	3/14/2022	1053.51	110.29	943.22
YVD-06	6/5/2022	1053.51	111.01	942.50
YVD-07	9/16/2013	1073.03	157.99	915.04
YVD-07	12/9/2013	1073.03	157.26	915.77
YVD-07	3/16/2014	1073.03	153.95	919.08
YVD-07	6/1/2014	1073.03	153.87	919.16
YVD-07	9/21/2014	1073.03	155.93	917.10
YVD-07	12/14/2014	1073.03	155.40	917.63
YVD-07	3/5/2015	1073.03	153.42	919.61
YVD-07	6/15/2015	1073.03	154.30	918.73
YVD-07	9/21/2015	1073.03	157.09	915.94
YVD-07	12/13/2015	1073.03	158.05	914.98
YVD-07	3/8/2016	1073.03	157.96	915.07
YVD-07	6/19/2016	1073.03	158.75	914.28
YVD-07	9/25/2016	1073.03	160.29	912.74
YVD-07	12/11/2016	1073.03	160.00	913.03
YVD-07	3/5/2017	1073.03	157.59	915.44
YVD-07	6/4/2017	1073.03	157.56	915.47
YVD-07	9/27/2017	1073.03	159.81	913.22
YVD-07	12/3/2017	1073.03	159.30	913.73
YVD-07	3/18/2018	1073.03	156.76	916.27
YVD-07	6/3/2018	1073.03	156.44	916.59
YVD-07	9/8/2018	1073.03	158.22	914.81
YVD-07	12/9/2018	1073.03	158.27	914.76
YVD-07	3/21/2019	1073.03	156.58	916.45
YVD-07	6/1/2019	1073.03	157.05	915.98
YVD-07	9/8/2019	1073.03	159.06	913.97
YVD-07	12/8/2019	1073.03	160.48	912.55
YVD-07	3/29/2020	1073.03	159.62	913.41
YVD-07	6/7/2020	1073.03	160.42	912.61
YVD-07	9/20/2020	1073.03	162.61	910.42
YVD-07	12/6/2020	1073.03	164.10	908.93
YVD-07	2/28/2021	1073.03	162.27	910.76
YVD-07	6/6/2021	1073.03	161.15	911.88
YVD-07	9/20/2021	1073.03	163.83	909.20
YVD-07	12/14/2021	1073.03	163.66	909.37
YVD-07	3/14/2022	1073.03	159.94	913.09
YVD-07	6/5/2022	1073.03	159.47	913.56
YVD-08	9/16/2013	1014.38	170.83	843.55
YVD-08	12/9/2013	1014.38	171.08	843.30
YVD-08	3/16/2014	1014.38	170.66	843.72
YVD-08	6/1/2014	1014.38	170.50	843.88
YVD-08	9/21/2014	1014.38	170.50	843.88
YVD-08	12/14/2014	1014.38	170.22	844.16
YVD-08	3/5/2015	1014.38	169.83	844.55
YVD-08	6/15/2015	1014.38	170.13	844.25
YVD-08	9/21/2015	1014.38	170.67	843.71
YVD-08	12/13/2015	1014.38	170.63	843.75

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-08	3/8/2016	1014.38	171.00	843.38
YVD-08	6/19/2016	1014.38	171.51	842.87
YVD-08	9/25/2016	1014.38	171.75	842.63
YVD-08	12/11/2016	1014.38	171.52	842.86
YVD-08	3/5/2017	1014.38	171.16	843.22
YVD-08	6/4/2017	1014.38	171.87	842.51
YVD-08	9/27/2017	1014.38	172.30	842.08
YVD-08	12/3/2017	1014.38	171.95	842.43
YVD-08	3/18/2018	1014.38	172.17	842.21
YVD-08	6/3/2018	1014.38	172.10	842.28
YVD-08	9/8/2018	1014.38	172.36	842.02
YVD-08	12/9/2018	1014.38	172.39	841.99
YVD-08	3/21/2019	1014.38	172.03	842.35
YVD-08	6/1/2019	1014.38	172.39	841.99
YVD-08	9/8/2019	1014.38	172.56	841.82
YVD-08	12/8/2019	1014.38	172.73	841.65
YVD-08	3/29/2020	1014.38	172.66	841.72
YVD-08	6/7/2020	1014.38	172.87	841.51
YVD-08	9/20/2020	1014.38	173.33	841.05
YVD-08	12/6/2020	1014.38	173.75	840.63
YVD-08	2/28/2021	1014.38	173.87	840.51
YVD-08	6/6/2021	1014.38	173.75	840.63
YVD-08	9/20/2021	1014.38	174.58	839.80
YVD-08	12/14/2021	1014.38	174.37	840.01
YVD-08	3/14/2022	1014.38	174.83	839.55
YVD-08	6/5/2022	1014.38	174.85	839.53
YVD-09	9/16/2013	966.81	111.14	855.67
YVD-09	12/9/2013	966.81	109.93	856.88
YVD-09	3/16/2014	966.81	109.65	857.16
YVD-09	6/1/2014	966.81	109.95	856.86
YVD-09	9/21/2014	966.81	110.08	856.73
YVD-09	12/14/2014	966.81	109.90	856.91
YVD-09	3/5/2015	966.81	109.95	856.86
YVD-09	6/15/2015	966.81	110.35	856.46
YVD-09	9/21/2015	966.81	110.83	855.98
YVD-09	12/13/2015	966.81	110.89	855.92
YVD-09	3/8/2016	966.81	111.16	855.65
YVD-09	6/19/2016	966.81	111.41	855.40
YVD-09	9/25/2016	966.81	111.68	855.13
YVD-09	12/11/2016	966.81	111.84	854.97
YVD-09	3/5/2017	966.81	111.92	854.89
YVD-09	6/4/2017	966.81	112.29	854.52
YVD-09	9/27/2017	966.81	112.50	854.31
YVD-09	12/3/2017	966.81	112.59	854.22
YVD-09	3/18/2018	966.81	112.56	854.25
YVD-09	6/3/2018	966.81	112.28	854.53
YVD-09	9/8/2018	966.81	112.19	854.62
YVD-09	12/9/2018	966.81	111.77	855.04
YVD-09	3/21/2019	966.81	111.78	855.03
YVD-09	6/1/2019	966.81	112.03	854.78
YVD-09	9/8/2019	966.81	112.37	854.44
YVD-09	12/8/2019	966.81	112.55	854.26
YVD-09	3/29/2020	966.81	112.60	854.21
YVD-09	6/7/2020	966.81	112.92	853.89
YVD-09	9/20/2020	966.81	113.29	853.52
YVD-09	12/6/2020	966.81	113.55	853.26
YVD-09	2/28/2021	966.81	113.63	853.18
YVD-09	6/6/2021	966.81	113.80	853.01
YVD-09	9/20/2021	966.81	114.41	852.40
YVD-09	12/14/2021	966.81	114.66	852.15
YVD-09	3/14/2022	966.81	114.54	852.27
YVD-09	6/5/2022	966.81	114.70	852.11
YVD-10	9/16/2013	958.00	90.04	867.96
YVD-10	12/9/2013	958.00	89.20	868.80
YVD-10	3/16/2014	958.00	89.39	868.61
YVD-10	6/1/2014	958.00	90.35	867.65
YVD-10	9/21/2014	958.00	90.41	867.59
YVD-10	12/14/2014	958.00	88.76	869.24
YVD-10	3/5/2015	958.00	89.90	868.10

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-10	6/15/2015	958.00	91.10	866.90
YVD-10	9/21/2015	958.00	91.85	866.15
YVD-10	12/13/2015	958.00	91.52	866.48
YVD-10	3/8/2016	958.00	91.91	866.09
YVD-10	6/19/2016	958.00	92.92	865.08
YVD-10	9/25/2016	958.00	92.99	865.01
YVD-10	12/11/2016	958.00	93.02	864.98
YVD-10	3/5/2017	958.00	93.24	864.76
YVD-10	6/4/2017	958.00	93.70	864.30
YVD-10	9/27/2017	958.00	93.39	864.61
YVD-10	12/3/2017	958.00	92.86	865.14
YVD-10	3/18/2018	958.00	92.49	865.51
YVD-10	6/3/2018	958.00	92.81	865.19
YVD-10	9/8/2018	958.00	93.35	864.65
YVD-10	12/9/2018	958.00	92.50	865.50
YVD-10	3/21/2019	958.00	92.36	865.64
YVD-10	6/1/2019	958.00	93.03	864.97
YVD-10	9/8/2019	958.00	93.67	864.33
YVD-10	12/8/2019	958.00	93.44	864.56
YVD-10	3/29/2020	958.00	94.06	863.94
YVD-10	6/7/2020	958.00	94.38	863.62
YVD-10	9/20/2020	958.00	94.92	863.08
YVD-10	12/6/2020	958.00	94.39	863.61
YVD-10	2/28/2021	958.00	94.67	863.33
YVD-10	6/6/2021	958.00	95.54	862.46
YVD-10	9/20/2021	958.00	95.88	862.12
YVD-10	12/14/2021	958.00	95.35	862.65
YVD-10	3/14/2022	958.00	95.06	862.94
YVD-10	6/5/2022	958.00	95.62	862.38
YVD-11	9/16/2013	967.91	106.03	861.88
YVD-11	12/9/2013	967.91	105.77	862.14
YVD-11	3/16/2014	967.91	105.72	862.19
YVD-11	6/1/2014	967.91	106.07	861.84
YVD-11	9/21/2014	967.91	106.04	861.87
YVD-11	12/14/2014	967.91	106.08	861.83
YVD-11	3/5/2015	967.91	106.18	861.73
YVD-11	6/15/2015	967.91	106.67	861.24
YVD-11	9/21/2015	967.91	106.52	861.39
YVD-11	12/13/2015	967.91	106.88	861.03
YVD-11	3/8/2016	967.91	107.58	860.33
YVD-11	6/19/2016	967.91	108.52	859.39
YVD-11	9/25/2016	967.91	108.95	858.96
YVD-11	12/11/2016	967.91	108.90	859.01
YVD-11	3/5/2017	967.91	109.08	858.83
YVD-11	6/4/2017	967.91	109.31	858.60
YVD-11	9/27/2017	967.91	108.75	859.16
YVD-11	12/3/2017	967.91	107.73	860.18
YVD-11	3/18/2018	967.91	108.10	859.81
YVD-11	6/3/2018	967.91	108.63	859.28
YVD-11	9/8/2018	967.91	108.97	858.94
YVD-11	12/9/2018	967.91	108.16	859.75
YVD-11	3/21/2019	967.91	108.58	859.33
YVD-11	6/1/2019	967.91	109.00	858.91
YVD-11	9/8/2019	967.91	109.58	858.33
YVD-11	12/8/2019	967.91	109.63	858.28
YVD-11	3/29/2020	967.91	110.09	857.82
YVD-11	6/7/2020	967.91	110.52	857.39
YVD-11	9/20/2020	967.91	111.12	856.79
YVD-11	12/6/2020	967.91	111.12	856.79
YVD-11	2/28/2021	967.91	111.24	856.67
YVD-11	6/6/2021	967.91	111.79	856.12
YVD-11	9/20/2021	967.91	111.94	855.97
YVD-11	12/14/2021	967.91	111.87	856.04
YVD-11	3/14/2022	967.91	112.00	855.91
YVD-11	6/5/2022	967.91	112.49	855.42
YVD-12	9/16/2013	961.91	138.50	823.41
YVD-12	12/9/2013	961.91	138.34	823.57
YVD-12	3/16/2014	961.91	137.55	824.36
YVD-12	6/1/2014	961.91	137.61	824.30

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-12	9/21/2014	961.91	137.45	824.46
YVD-12	12/14/2014	961.91	137.25	824.66
YVD-12	3/5/2015	961.91	136.52	825.39
YVD-12	6/15/2015	961.91	137.85	824.06
YVD-12	9/21/2015	961.91	138.95	822.96
YVD-12	12/13/2015	961.91	138.11	823.80
YVD-12	3/8/2016	961.91	138.26	823.65
YVD-12	6/19/2016	961.91	139.23	822.68
YVD-12	9/25/2016	961.91	139.13	822.78
YVD-12	12/11/2016	961.91	138.56	823.35
YVD-12	3/5/2017	961.91	138.02	823.89
YVD-12	6/4/2017	961.91	138.90	823.01
YVD-12	9/27/2017	961.91	139.05	822.86
YVD-12	12/3/2017	961.91	138.48	823.43
YVD-12	3/18/2018	961.91	138.46	823.45
YVD-12	6/3/2018	961.91	138.75	823.16
YVD-12	9/8/2018	961.91	139.15	822.76
YVD-12	12/9/2018	961.91	139.14	822.77
YVD-12	3/21/2019	961.91	138.69	823.22
YVD-12	6/1/2019	961.91	139.27	822.64
YVD-12	9/8/2019	961.91	139.67	822.24
YVD-12	12/8/2019	961.91	139.51	822.40
YVD-12	3/29/2020	961.91	139.82	822.09
YVD-12	6/7/2020	961.91	140.11	821.80
YVD-12	9/20/2020	961.91	140.51	821.40
YVD-12	12/6/2020	961.91	140.48	821.43
YVD-12	2/28/2021	961.91	140.39	821.52
YVD-12	6/6/2021	961.91	140.70	821.21
YVD-12	9/20/2021	961.91	141.51	820.40
YVD-12	12/14/2021	961.91	140.81	821.10
YVD-12	3/14/2022	961.91	141.28	820.63
YVD-12	6/5/2022	961.91	141.39	820.52
YVD-13	9/16/2013	965.59	127.43	838.16
YVD-13	12/9/2013	965.59	127.25	838.34
YVD-13	3/16/2014	965.59	127.58	838.01
YVD-13	6/1/2014	965.59	127.59	838.00
YVD-13	9/21/2014	965.59	127.29	838.30
YVD-13	12/14/2014	965.59	127.20	838.39
YVD-13	3/5/2015	965.59	127.35	838.24
YVD-13	6/15/2015	965.59	127.60	837.99
YVD-13	9/21/2015	965.59	127.36	838.23
YVD-13	12/13/2015	965.59	127.13	838.46
YVD-13	3/8/2016	965.59	127.87	837.72
YVD-13	6/19/2016	965.59	128.17	837.42
YVD-13	9/25/2016	965.59	127.88	837.71
YVD-13	12/11/2016	965.59	127.57	838.02
YVD-13	3/5/2017	965.59	127.92	837.67
YVD-13	6/4/2017	965.59	128.49	837.10
YVD-13	9/27/2017	965.59	128.05	837.54
YVD-13	12/3/2017	965.59	127.88	837.71
YVD-13	3/18/2018	965.59	128.47	837.12
YVD-13	6/3/2018	965.59	128.44	837.15
YVD-13	9/8/2018	965.59	128.28	837.31
YVD-13	12/9/2018	965.59	127.87	837.72
YVD-13	3/21/2019	965.59	128.46	837.13
YVD-13	6/1/2019	965.59	128.88	836.71
YVD-13	9/8/2019	965.59	128.62	836.97
YVD-13	12/8/2019	965.59	128.51	837.08
YVD-13	3/29/2020	965.59	129.09	836.50
YVD-13	6/7/2020	965.59	129.53	836.06
YVD-13	9/20/2020	965.59	129.32	836.27
YVD-13	12/6/2020	965.59	129.18	836.41
YVD-13	2/28/2021	965.59	129.66	835.93
YVD-13	6/6/2021	965.59	129.99	835.60
YVD-13	9/20/2021	965.59	130.05	835.54
YVD-13	12/14/2021	965.59	129.81	835.78
YVD-13	3/14/2022	965.59	130.36	835.23
YVD-13	6/5/2022	965.59	130.57	835.02

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-14	9/16/2013	920.19	77.30	842.89
YVD-14	12/9/2013	920.19	76.97	843.22
YVD-14	3/16/2014	920.19	77.45	842.74
YVD-14	6/1/2014	920.19	77.61	842.58
YVD-14	9/21/2014	920.19	77.28	842.91
YVD-14	12/14/2014	920.19	76.90	843.29
YVD-14	3/5/2015	920.19	77.51	842.68
YVD-14	6/17/2015	NM	NM	
YVD-14	9/21/2015	NM	NM	
YVD-14R	12/13/2015	921.41	77.76	843.65
YVD-14R	3/8/2016	921.41	78.53	842.88
YVD-14R	6/19/2016	921.41	79.03	842.38
YVD-14R	9/25/2016	921.41	78.68	842.73
YVD-14R	12/11/2016	921.41	78.57	842.84
YVD-14R	3/5/2017	921.41	79.14	842.27
YVD-14R	6/4/2017	921.41	79.53	841.88
YVD-14R	9/27/2017	921.41	78.93	842.48
YVD-14R	12/3/2017	921.41	78.72	842.69
YVD-14R	3/18/2018	921.41	79.40	842.01
YVD-14R	6/3/2018	921.41	79.35	842.06
YVD-14R	9/8/2018	921.41	79.26	842.15
YVD-14R	12/9/2018	921.41	78.93	842.48
YVD-14R	3/21/2019	921.41	79.75	841.66
YVD-14R	6/1/2019	921.41	80.14	841.27
YVD-14R	9/8/2019	921.41	79.74	841.67
YVD-14R	12/8/2019	921.41	79.60	841.81
YVD-14R	3/29/2020	921.41	80.46	840.95
YVD-14R	6/7/2020	921.41	80.83	840.58
YVD-14R	9/20/2020	921.41	80.55	840.86
YVD-14R	12/6/2020	921.41	80.38	841.03
YVD-14R	2/28/2021	921.41	80.92	840.49
YVD-14R	6/6/2021	921.41	81.41	840.00
YVD-14R	9/20/2021	921.41	81.13	840.28
YVD-14R	12/14/2021	921.41	80.95	840.46
YVD-14R	3/14/2022	921.41	81.65	839.76
YVD-14R	6/5/2022	921.41	82.01	839.40
YVD-15	9/16/2013	940.61	90.34	850.27
YVD-15	12/9/2013	940.61	90.49	850.12
YVD-15	3/16/2014	940.61	91.62	848.99
YVD-15	6/1/2014	940.61	92.57	848.04
YVD-15	9/21/2014	940.61	88.84	851.77
YVD-15	12/14/2014	940.61	90.56	850.05
YVD-15	3/5/2015	940.61	92.03	848.58
YVD-15	6/15/2015	940.61	93.22	847.39
YVD-15	9/21/2015	940.61	93.43	847.18
YVD-15	12/13/2015	940.61	93.21	847.40
YVD-15	3/8/2016	940.61	93.83	846.78
YVD-15	6/19/2016	940.61	94.70	845.91
YVD-15	9/25/2016	940.61	94.70	845.91
YVD-15	12/11/2016	940.61	94.44	846.17
YVD-15	3/5/2017	940.61	94.96	845.65
YVD-15	6/4/2017	940.61	95.52	845.09
YVD-15	9/27/2017	940.61	95.16	845.45
YVD-15	12/3/2017	940.61	94.74	845.87
YVD-15	3/18/2018	940.61	94.96	845.65
YVD-15	6/3/2018	940.61	95.32	845.29
YVD-15	9/8/2018	940.61	95.32	845.29
YVD-15	12/9/2018	940.61	94.79	845.82
YVD-15	3/21/2019	940.61	95.36	845.25
YVD-15	6/1/2019	940.61	95.83	844.78
YVD-15	9/8/2019	940.61	95.92	844.69
YVD-15	12/8/2019	940.61	95.55	845.06
YVD-15	3/29/2020	940.61	96.14	844.47
YVD-15	6/7/2020	940.61	96.58	844.03
YVD-15	9/20/2020	940.61	96.50	844.11
YVD-15	12/6/2020	940.61	95.96	844.65
YVD-15	2/28/2021	940.61	96.25	844.36
YVD-15	6/6/2021	940.61	96.97	843.64
YVD-15	9/20/2021	940.61	97.05	843.56
YVD-15	12/14/2021	940.61	96.53	844.08

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-15	3/14/2022	940.61	96.95	843.66
YVD-15	6/5/2022	940.61	97.51	843.10
YVD-16	9/16/2013	975.90	112.95	862.95
YVD-16	12/9/2013	975.90	112.84	863.06
YVD-16	3/16/2014	975.90	112.50	863.40
YVD-16	6/1/2014	975.90	112.62	863.28
YVD-16	9/21/2014	975.90	113.02	862.88
YVD-16	12/14/2014	975.90	112.86	863.04
YVD-16	3/5/2015	975.90	112.42	863.48
YVD-16	6/15/2015	975.90	112.85	863.05
YVD-16	9/21/2015	975.90	113.95	861.95
YVD-16	12/13/2015	975.90	114.04	861.86
YVD-16	3/8/2016	975.90	114.51	861.39
YVD-16	6/19/2016	975.90	115.18	860.72
YVD-16	9/25/2016	975.90	115.67	860.23
YVD-16	12/11/2016	975.90	115.17	860.73
YVD-16	3/5/2017	975.90	114.90	861.00
YVD-16	6/4/2017	975.90	115.51	860.39
YVD-16	9/27/2017	975.90	115.32	860.58
YVD-16	12/3/2017	975.90	114.86	861.04
YVD-16	3/18/2018	975.90	114.49	861.41
YVD-16	6/3/2018	975.90	114.62	861.28
YVD-16	9/8/2018	975.90	115.77	860.13
YVD-16	12/9/2018	975.90	115.57	860.33
YVD-16	3/21/2019	975.90	115.14	860.76
YVD-16	6/1/2019	975.90	115.72	860.18
YVD-16	9/8/2019	975.90	116.43	859.47
YVD-16	12/8/2019	975.90	116.71	859.19
YVD-16	3/29/2020	975.90	116.83	859.07
YVD-16	6/7/2020	975.90	117.34	858.56
YVD-16	9/20/2020	975.90	118.44	857.46
YVD-16	12/6/2020	975.90	118.68	857.22
YVD-16	2/28/2021	975.90	118.70	857.20
YVD-16	6/6/2021	975.90	118.88	857.02
YVD-16	9/20/2021	975.90	119.54	856.36
YVD-16	12/14/2021	975.90	119.34	856.56
YVD-16	3/14/2022	975.90	119.54	856.36
YVD-16	6/5/2022	975.90	119.79	856.11
YVD-17	9/16/2013	866.73	32.07	834.66
YVD-17	12/9/2013	866.73	34.81	831.92
YVD-17	3/16/2014	866.73	37.97	828.76
YVD-17	6/1/2014	866.73	35.50	831.23
YVD-17	9/21/2014	866.73	31.86	834.87
YVD-17	12/14/2014	866.73	34.74	831.99
YVD-17	3/5/2015	866.73	37.79	828.94
YVD-17	6/15/2015	866.73	34.57	832.16
YVD-17	9/21/2015	866.73	31.92	834.81
YVD-17	12/13/2015	866.73	35.16	831.57
YVD-17	3/8/2016	866.73	37.47	829.26
YVD-17	6/19/2016	866.73	35.37	831.36
YVD-17	9/25/2016	866.73	32.31	834.42
YVD-17	12/11/2016	866.73	35.20	831.53
YVD-17	3/5/2017	866.73	37.88	828.85
YVD-17	6/4/2017	866.73	36.13	830.60
YVD-17	9/27/2017	866.73	31.22	835.51
YVD-17	12/3/2017	866.73	34.65	832.08
YVD-17	3/18/2018	866.73	38.54	828.19
YVD-17	6/3/2018	866.73	36.20	830.53
YVD-17	9/8/2018	866.73	32.64	834.09
YVD-17	12/9/2018	866.73	35.42	831.31
YVD-17	3/21/2019	866.73	39.08	827.65
YVD-17	6/1/2019	866.73	37.30	829.43
YVD-17	9/9/2019	866.73	32.69	834.04
YVD-17	12/8/2019	866.73	35.95	830.78
YVD-17	3/29/2020	866.73	39.61	827.12
YVD-17	6/7/2020	866.73	36.93	829.80
YVD-17	9/20/2020	866.73	33.68	833.05
YVD-17	12/6/2020	866.73	36.31	830.42
YVD-17	2/28/2021	866.73	39.80	826.93

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-17	6/6/2021	866.73	37.82	828.91
YVD-17	9/20/2021	866.73	34.26	832.47
YVD-17	12/14/2021	866.73	37.37	829.36
YVD-17	3/14/2022	866.73	40.62	826.11
YVD-17	6/5/2022	866.73	38.57	828.16
YVD-18	9/16/2013	965.74	127.49	838.25
YVD-18	12/9/2013	965.74	127.45	838.29
YVD-18	3/16/2014	965.74	127.75	837.99
YVD-18	6/1/2014	965.74	127.69	838.05
YVD-18	9/21/2014	965.74	127.33	838.41
YVD-18	12/14/2014	965.74	127.33	838.41
YVD-18	3/5/2015	965.74	127.46	838.28
YVD-18	6/15/2015	965.74	127.71	838.03
YVD-18	9/21/2015	965.74	127.42	838.32
YVD-18	12/13/2015	965.74	127.24	838.50
YVD-18	3/8/2016	965.74	128.05	837.69
YVD-18	6/19/2016	965.74	128.29	837.45
YVD-18	9/25/2016	965.74	127.92	837.82
YVD-18	12/11/2016	965.74	127.66	838.08
YVD-18	3/5/2017	965.74	128.01	837.73
YVD-18	6/4/2017	965.74	128.54	837.20
YVD-18	9/27/2017	965.74	128.14	837.60
YVD-18	12/3/2017	965.74	127.95	837.79
YVD-18	3/18/2018	965.74	128.72	837.02
YVD-18	6/3/2018	965.74	128.48	837.26
YVD-18	9/8/2018	965.74	128.35	837.39
YVD-18	12/9/2018	965.74	128.00	837.74
YVD-18	3/21/2019	965.74	128.62	837.12
YVD-18	6/1/2019	965.74	129.04	836.70
YVD-18	9/8/2019	965.74	128.71	837.03
YVD-18	12/8/2019	965.74	128.63	837.11
YVD-18	3/29/2020	965.74	129.29	836.45
YVD-18	6/7/2020	965.74	129.67	836.07
YVD-18	9/20/2020	965.74	129.41	836.33
YVD-18	12/6/2020	965.74	129.32	836.42
YVD-18	2/28/2021	965.74	129.90	835.84
YVD-18	6/6/2021	965.74	130.11	835.63
YVD-18	9/20/2021	965.74	130.20	835.54
YVD-18	12/14/2021	965.74	129.97	835.77
YVD-18	3/14/2022	965.74	130.62	835.12
YVD-18	6/5/2022	965.74	130.74	835.00

Notes:
1. Erroneous or anomalous measurement; not included in dataset.
2. Well not accessible; partly paved over.
BTOC: below top of casing
NAVD88: North American Vertical Datum of 1988
NM: not measured due to well damage

Table 5
Estimated Possible Average Linear Groundwater Flow Velocities – Second Quarter 2022

Material	Hydraulic Conductivity[1,2] [K] (feet per day)	Effective Porosity[3] [n_e]	K/n_e	Estimated Possible Average Linear Groundwater Flow Velocities [V_X] (feet per day)			
				Second Quarter 2022 Hydraulic Gradients			
				Site Average I[4]	Upslope I	Central I	Southern I
				0.013	***0.026***	***0.011***	***0.004***
Fine sand	53	0.33	161	2.0	4.2	1.7	0.7
Medium sand to fine gravel	131	0.32	409	5.2	10.7	4.4	1.8
Medium sand to coarse gravel	164	0.30	547	6.9	14.3	5.9	2.4
Fine gravel	267	0.28	954	12.1	24.9	10.3	4.2

Notes:

1. Hydraulic conductivities obtained from U.S. Environmental Protection Agency Method 9100, Saturated Hydraulic Conductivity, Saturated Leachate Conductivity, and Intrinsic Permeability, Chapter 6 – Properties; Publication SW-846: *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* ; 1986.
2. Hydraulic conductivities presented are for well-sorted (poorly graded) material.
3. Effective porosity obtained from *Data Collection Handbook to Support Modeling Impacts of Radioactive Material in Soil* ; Environmental Assessment and Information Sciences Division, Argonne National Laboratory; Argonne, Illinois; April 1993.
4. Hydraulic gradient [I] in feet per foot.

Table 6
Field Parameter Measurements – Second Quarter 2022

Well ID	Measurement Date	Bladder Pump Type (portable or dedicated)	Purge Time (minutes)	Volume Purged (liters)	Temperature (°C)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH (Standard Units)	Oxidation/Reduction Potential (mV)	Turbidity (NTU)
DC-01	6/6/2022	Dedicated	130	16.8	17.0	7.21	752	7.76	84.0	2.77
DC-03	6/5/2022	Dedicated	15	1.8	15.8	6.95	2327	7.15	158.6	1.86
DC-03D	6/5/2022	Dedicated	15	4.4	15.1	1.64	1410	7.03	140.7	0.78
DC-04	6/5/2022	Dedicated	15	3.7	15.0	8.57	1354	7.13	148.0	1.07
DC-05	6/5/2022	Dedicated	15	3.7	14.8	7.99	1225	7.23	134.5	1.66
DC-05D	6/5/2022	Dedicated	15	3.4	14.6	9.74	584.9	7.78	135.7	0.88
DC-07	6/5/2022	Dedicated	19	4.5	15.4	1.85	1288	6.81	127.4	0.78
DC-09	6/7/2022	Dedicated	20	2.2	16.6	10.69	418.3	7.79	101.0	1.09
DC-14	6/7/2022	Dedicated	15	2.0	16.6	2.20	1883	6.58	104.8	0.60
YVD-02	NS	Dedicated	---	---	---	---	---	---	---	---
YVD-03	6/8/2022	Dedicated	21	1.3	19.6	5.70	568.0	7.29	91.0	2.88
YVD-04	6/6/2022	Dedicated	30	1.2	18.0	8.06	480.6	7.93	63.3	1.59
YVD-05	6/6/2022	Dedicated	20	1.2	20.6	7.39	590.0	7.87	152.7	1.77
YVD-06	6/7/2022	Dedicated	15	1.5	18.7	8.89	287.6	7.79	123.0	0.66
YVD-07	6/6/2022	Dedicated	20	1.6	17.5	8.57	455.8	8.26	118.7	1.30
YVD-08	6/7/2022	Dedicated	15	2.8	16.5	6.38	1566	7.18	190.0	1.95
YVD-09	6/6/2022	Dedicated	15	3.2	15.9	6.78	1515	7.28	202.0	1.09
YVD-10	6/5/2022	Dedicated	18	3.1	14.4	7.80	2253	7.00	153.7	1.22
YVD-11	6/6/2022	Dedicated	15	1.7	15.9	6.18	1897	7.15	186.3	1.57
YVD-12	6/6/2022	Dedicated	15	3.8	16.3	7.21	1135	7.72	174.3	2.19
YVD-13	6/7/2022	Dedicated	15	3.4	15.5	9.43	1195	7.74	232.4	1.25
YVD-14R	6/5/2022	Dedicated	15	3.2	15.5	2.03	2363	6.88	151.1	0.70
YVD-15	6/5/2022	Dedicated	16	3.9	14.7	7.53	999	7.51	151.0	0.71
YVD-16	6/6/2022	Dedicated	33	4.4	15.5	9.02	975	7.74	173.6	7.23
YVD-17	6/6/2022	Dedicated	15	3.0	14.6	6.25	298.5	8.04	149.7	1.31
YVD-18	6/7/2022	Dedicated	15	2.0	16.1	10.24	1004	8.01	188.8	0.86

Notes:

---: no value or not applicable

°C: degrees Celsius

µS/cm: microsiemens per centimeter

mg/L: milligrams per liter

mV: millivolt

NS: not sampled

NTU: nephelometric turbidity unit

Table 7
Groundwater Analytical Results – Second Quarter 2022

Analyte					Nitrate (as N)		
Analytical Method					EPA 300.0		
Well ID	Sample ID	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code
DC-01	YVD-060622-15	6/6/2022	N	K2206160	**7.80**	-	-
DC-03	YVD-060522-10	6/5/2022	N	K2206116	**157**	-	-
DC-03D	YVD-060522-11	6/5/2022	N	K2206116	**39.1**	-	-
DC-04	YVD-060522-05	6/5/2022	N	K2206116	**34.5**	-	-
DC-05	YVD-060522-02	6/5/2022	N	K2206116	**41.7**	-	-
DC-05	YVD-060522-03	6/5/2022	FD	K2206116	**40.6**	-	-
DC-05D	YVD-060522-04	6/5/2022	N	K2206116	**9.83**	-	-
DC-07	YVD-060522-08	6/5/2022	N	K2206116	**28.5**	-	-
DC-09	YVD-060722-29	6/7/2022	N	K2206237	**6.76**	J	HTQ
DC-14	YVD-060722-28	6/7/2022	N	K2206237	**57.4**	J	HTQ
YVD-02	NS[1]	6/7/2022	-	-	-	-	-
YVD-03	YVD-060822-31	6/8/2022	N	K2206299	**5.08**	-	-
YVD-03	YVD-060822-32	6/8/2022	FD	K2206299	**5.10**	-	-
YVD-04	YVD-060622-17	6/6/2022	N	K2206160	**4.70**	-	-
YVD-05	YVD-060622-19	6/6/2022	N	K2206160	**5.60**	-	-
YVD-06	YVD-060722-30	6/7/2022	N	K2206237	**0.67**	J	HTQ
YVD-07	YVD-060622-21	6/6/2022	N	K2206160	**4.30**	-	-
YVD-07	YVD-060622-22	6/6/2022	FD	K2206160	**4.30**	-	-
YVD-08	YVD-060722-27	6/7/2022	N	K2206237	**69.1**	J	HTQ
YVD-09	YVD-060622-12	6/6/2022	N	K2206160	**60.7**	-	-
YVD-10	YVD-060522-06	6/5/2022	N	K2206116	**55.3**	-	-
YVD-11	YVD-060622-18	6/6/2022	N	K2206160	**82.7**	-	-
YVD-12	YVD-060622-20	6/6/2022	N	K2206160	**19.5**	-	-
YVD-13	YVD-060722-24	6/7/2022	N	K2206237	**36.2**	J	HTQ
YVD-14R	YVD-060522-09	6/5/2022	N	K2206116	**125**	-	-
YVD-15	YVD-060522-07	6/5/2022	N	K2206116	**16.3**	-	-
YVD-16	YVD-060622-16	6/6/2022	N	K2206160	**21.0**	-	-
YVD-17	YVD-060622-14	6/6/2022	N	K2206160	**0.61**	-	-
YVD-18	YVD-060722-25	6/7/2022	N	K2206237	**30.9**	J	HTQ
YVD-18	YVD-060722-26	6/7/2022	FD	K2206237	**30.5**	J	HTQ

Notes:
1. Well dry; no sample could be collected.
Bold: detected result
-: not applicable
(as N): reported as nitrogen
EPA: U.S. Environmental Protection Agency
ERL: elevated reporting limit
FD: field duplicate
HTQ: Analysis completed outside of the designated holding time.
J: The compound was positively identified; however, the associated numerical value is an estimated concentration.
MS: The matrix spike/matrix spike duplicate percent recoveries were elevated.
mg/L: milligrams per liter
N: normal sample
NS: not sampled

Table 8
Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3-G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-01	DC-01-130104	01/04/2013	N	EPA01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**9.8**	-	-
DC-01	DC-01-130924	09/24/2013	N	SWI0178	**110**	-	-	**110**	-	-	-	-	-	0.1	U	-	**88.9**	-	-	**44**	-	-	0.5	U	-	**32.5**	-	-	**11.1**	-	-
DC-01	DC-01-131211	12/11/2013	N	SWL0063	**159**	-	-	**160**	-	-	-	-	-	-	R	MSD	**91.4**	-	-	**47.8**	-	-	5	U	-	**32.6**	-	-	**11.5**	-	-
DC-01	DC-01-140318	03/18/2014	N	SXC0095	**159**	-	-	**160**	-	-	-	-	-	**0.101**	-	-	**90.5**	-	-	**48.2**	-	-	5	U	-	**31.4**	-	-	**11.2**	-	-
DC-01	DC-01-140602	06/02/2014	N	SXF0017	**164**	-	-	**165**	-	-	-	-	-	0.1	U	-	**88.6**	-	-	**41.4**	-	-	2	U	-	**31.9**	-	-	**9.76**	-	-
DC-01	DC-01-140923	09/23/2014	N	SXI0158	**154**	-	-	**155**	-	-	-	-	-	-	R	MSD	**89.4**	-	-	**41.8**	-	-	5	U	-	**31.2**	-	-	**9**	-	-
DC-01	DC-01-141216	12/16/2014	N	SXL0121	**140**	-	-	**140**	-	-	-	-	-	0.1	U	-	**92.8**	-	-	**85.7**	-	-	5	U	-	**34.0**	-	-	**18.9**	-	-
DC-01	DC-01-150316	03/16/2015	N	5904471	**150**	-	-	**150**	-	-	-	-	-	0.1	U	-	**91.0**	-	-	**44**	-	-	5	U	-	**32.0**	-	-	**11**	-	-
DC-01	DC-01-150616	06/16/2015	N	59010751	**150**	-	-	**150**	-	-	-	-	-	0.1	U	-	**91.0**	J+	MSD	**42**	-	-	5	U	-	**33.0**	J+	MSD	**9.5**	-	-
DC-01	DC-01-150923	09/23/2015	N	59020281	**150**	-	-	**150**	-	-	-	-	-	**0.13**	-	-	**83.0**	-	-	**37**	-	-	5	U	-	**32.0**	-	-	**8.6**	-	-
DC-01	YVD-D1-150923	09/23/2015	FD	59020281	**160**	-	-	**160**	-	-	-	-	-	0.1	U	-	**85.0**	-	-	**43**	-	-	0.5	U	-	**33.0**	-	-	**10**	-	-
DC-01	DC-01-151214	12/14/2015	N	59025431	**170**	J	FDP	**170**	J	FDP	-	-	-	-	R	MSD	**97.0**	-	-	**38**	-	-	5	U	-	**34.0**	-	-	**8.8**	-	-
DC-01	DC-01-160308	03/08/2016	N	59029711	**150**	-	-	**150**	-	-	-	-	-	-	R	FBK, FDP	**83.0**	-	-	**40**	-	-	5	U	-	**30.0**	-	-	**8.6**	-	-
DC-01	DC-01-160620	6/20/2016	N	59037101	**150**	-	-	**150**	-	-	-	-	-	0.1	U	-	**83.0**	-	-	**40**	-	-	5	U	-	**31.0**	-	-	**9.2**	-	-
DC-01	DC-01-160928	9/28/2016	N	K1611629	**147**	-	-	**147**	-	-	-	-	-	0.050	U	MBK	**80.6**	-	-	**34.0**	-	-	**0.25**	-	-	**28.5**	-	-	**9.15**	-	-
DC-01	DC-01-161212	12/12/2016	N	K1615045	**144**	-	-	**144**	-	-	-	-	-	0.050	U	-	**81.1**	-	-	**31.9**	-	-	**0.39**	-	-	**27.9**	-	-	**8.89**	J	HTQ
DC-01	YVD-030817-18	3/8/2017	N	K1702324	**148**	-	-	**148**	-	-	-	-	-	1	U	-	**80.8**	-	-	**32.6**	-	-	**0.39**	-	-	**27**	-	-	**9.0**	-	-
DC-01	YVD-060417-03	6/4/2017	N	K1705702	**147**	-	-	**147**	-	-	-	-	-	0.050	U	-	**83.4**	-	-	**32.9**	-	-	**0.40**	-	-	**26.2**	-	-	**8.2**	-	-
DC-01	YVD-060417-05	6/4/2017	FD	K1705702	**147**	-	-	**147**	-	-	-	-	-	0.050	U	-	**83.0**	-	-	**33.2**	-	-	**0.38**	-	-	**25.7**	-	-	**8.2**	-	-
DC-01	YVD-092517-13	9/25/2017	N	K1710333	**148**	-	-	**148**	-	-	-	-	-	0.050	U	-	**78.9**	-	-	**33.2**	-	-	**0.37**	-	-	**26.1**	-	-	**8.41**	-	-
DC-01	YVD-120617-31	12/6/2017	N	K1713157	**146**	-	-	**146**	-	-	-	-	-	0.050	U	-	**83.7**	-	-	**33.2**	-	-	**0.37**	-	-	**28.1**	-	-	**8.81**	-	-
DC-01	YVD-060418-19	6/4/2018	N	874662	**141**	-	-	**141**	-	-	0.070	U	FBK	-	-	-	**80.5**	-	-	**34.6**	-	-	**0.36**	-	-	**28.75**	-	-	**8.60**	-	-
DC-01	YVD-060219-03	6/2/2019	N	991939	**142**	-	-	**142**	-	-	0.070	U	-	-	-	-	**76.5**	-	-	46.3	U	FBK	0.99	U	FBK	**26.15**	-	-	**8.60**	-	-
DC-01	YVD-060820-07	6/8/2020	N	009144	**143**	-	-	**143**	-	-	0.070	U	-	-	-	-	**76.0**	-	-	**33.1**	-	-	**0.30**	-	-	**26.30**	-	-	**7.60**	-	-
DC-01	YVD-060721-10	6/7/2021	N	124105	**140**	-	-	**140**	-	-	0.070	U	-	-	-	-	**72.5**	-	-	**32.4**	-	-	**0.32**	-	-	**25.15**	-	-	**8.00**	-	-
DC-01	YVD-060622-15	6/6/2022	N	K2206160	**-**	-	-	**-**	-	-	-	-	-	-	-	-	**-**	-	-	**-**	-	-	**-**	-	-	**-**	-	-	**7.80**	-	-
DC-03	DC-03-130102	01/02/2013	N	EPA01	-	-	-	-	-	-	-	-	-	0.1	U	-	-	-	-	-	-	-	-	-	-	-	-	-	**190**	-	-
DC-03	DC-03-130918	09/18/2013	N	SWI0138	**435**	-	-	**435**	-	-	-	-	-	0.1	U	-	**284**	-	-	**176**	-	-	5	U	-	**73.7**	-	-	**166**	-	-
DC-03	DC-03-131212	12/12/2013	N	SWL0078	**474**	-	-	**475**	-	-	-	-	-	0.02	U	-	**280**	-	-	**172**	-	-	5	U	-	**75.0**	-	-	**174**	-	-
DC-03	YVD-D3-131212	12/12/2013	FD	SWL0078	**459**	-	-	**460**	-	-	-	-	-	0.02	U	-	**292**	-	-	**142**	-	-	5	U	-	**77.3**	-	-	**182**	-	-
DC-03	DC-03-140319	03/19/2014	N	SXC0107	**459**	-	-	**460**	-	-	-	-	-	0.1	U	-	**261**	-	-	**159**	J	FDP	5	U	-	**66.8**	-	-	**195**	-	-
DC-03	YVD-D3-140319	03/19/2014	FD	SXC0107	**469**	-	-	**470**	-	-	-	-	-	0.1	U	-	**261**	-	-	**128**	J	FDP	5	U	-	**66.7**	-	-	**164**	-	-
DC-03	DC-03-140604	06/04/2014	N	SXF0025	**425**	-	-	**425**	-	-	-	-	-	0.1	U	-	**259**	-	-	**201**	-	-	10	U	-	**67.7**	-	-	**234**	-	-
DC-03	DC-03-140924	09/24/2014	N	SXI0173	**409**	-	-	**410**	-	-	-	-	-	0.1	U	-	**291**	-	-	**147**	-	-	5	U	-	**77.1**	-	-	**170**	-	-
DC-03	DC-03-141217	12/17/2014	N	SXL0144	**429**	-	-	**430**	-	-	-	-	-	**0.18**	J+	FBK, MBK	**274**	-	-	**157**	-	-	10	U	-	**74.9**	-	-	**193**	-	-
DC-03	YVD-D4-141217	12/17/2014	FD	SXL0144	**423**	-	-	**425**	-	-	-	-	-	0.1	U	-	**271**	-	-	**182**	-	-	5	U	-	**72.6**	-	-	**156**	-	-
DC-03	DC-03-150318	03/18/2015	N	5904651	**420**	-	-	**420**	-	-	-	-	-	0.1	U	-	**260**	-	-	**160**	-	-	5	U	-	**73.0**	-	-	**180**	-	-
DC-03	YVD-D4-150318	03/18/2015	FD	5904651	**410**	-	-	**410**	-	-	-	-	-	**0.12**	-	-	**270**	-	-	**150**	-	-	2.5	U	-	**74.0**	-	-	**180**	-	-
DC-03	DC-03-150617	06/17/2015	N	59011021	**460**	-	-	**460**	-	-	-	-	-	0.1	U	-	**290**	-	-	**170**	-	-	5	U	-	**78.0**	J	RPD	**180**	J-	MSD, FDP
DC-03	YVD-D4-150617	06/17/2015	FD	59011021	**450**	-	-	**450**	-	-	-	-	-	0.1	U	-	**290**	-	-	**180**	-	-	5	U	-	**77.0**	J	RPD	**10**	J-	MSD, FDP
DC-03	DC-03-150925	09/25/2015	N	59020431	**390**	-	-	**390**	-	-	-	-	-	**0.1**	-	-	**270**	-	-	**140**	-	-	10	U	-	**73.0**	-	-	**180**	-	-
DC-03	YVD-D4-150925	09/25/2015	FD	59020431	**460**	-	-	**460**	-	-	-	-	-	**0.2**	-	-	**260**	-	-	**140**	-	-	0.5	U	-	**69.0**	-	-	**180**	-	-
DC-03	DC-03-151216	12/16/2015	N	59025501	**400**	-	-	**400**	-	-	-	-	-	**0.18**	J-	MSD	**260**	-	-	**170**	-	-	5	U	-	**75.0**	-	-	**200**	-	-
DC-03	YVD-D4-151216	12/16/2015	FD	59025501	**380**	-	-	**380**	-	-	-	-	-	-	R	MSD	**250**	-	-	**160**	-	-	2.5	U	-	**75.0**	-	-	**170**	-	-

Table 8
Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3-G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-03	DC-03-160310	03/10/2016	N	59029941	**460**	-	-	**460**	-	-	-	-	-	0.1	U	-	**270**	-	-	**150**	-	-	5	U	-	**72.0**	-	-	**180**	-	-
DC-03	YVD-D4-160310	03/10/2016	FD	59029941	**480**	-	-	**480**	-	-	-	-	-	0.1	U	-	**270**	-	-	**160**	-	-	5	U	-	**72.0**	-	-	**190**	-	-
DC-03	DC-03-160623	6/23/2016	N	59037371	**420**	-	-	**420**	-	-	-	-	-	**0.12**	J-	MSD	**270**	-	-	**150**	-	-	5	U	-	**73.0**	-	-	**180**	-	-
DC-03	YVD-D4-160623	6/23/2016	FD	59037371	**410**	-	-	**410**	-	-	-	-	-	**0.11**	J-	MSD	**250**	-	-	**160**	-	-	2.5	U	-	**71.0**	-	-	**170**	-	-
DC-03	DC-03-160927	9/27/2016	N	K1611565	**425**	-	-	**425**	-	-	-	-	-	0.050	U	MBK	**265**	-	-	**136**	-	-	**0.20**	J	-	**72.4**	-	-	**163**	-	-
DC-03	DC-03-D2-160927	9/27/2016	FD	K1611565	**427**	-	-	**427**	-	-	-	-	-	0.050	U	MBK	**262**	-	-	**137**	-	-	**0.19**	J	-	**71.9**	-	-	**163**	-	-
DC-03	DC-03-161212	12/12/2016	N	K1615029	**371**	-	-	**371**	-	-	-	-	-	0.050	U	-	**254**	-	-	**131**	-	-	**0.24**	-	-	**65.7**	-	-	**168**	J	HTQ
DC-03	YVD-030817-13	3/8/2017	N	K1702324	**381**	-	-	**381**	-	-	-	-	-	1	U	-	**267**	-	-	**150**	-	-	**0.22**	-	-	**66.0**	-	-	**179**	-	-
DC-03	YVD-060517-02	6/5/2017	N	K1705702	**358**	-	-	**358**	-	-	-	-	-	0.050	U	-	**271**	-	-	**152**	-	-	**0.24**	-	-	**61.6**	-	-	**181**	-	-
DC-03	YVD-060517-04	6/5/2017	FD	K1705702	**360**	-	-	**360**	-	-	-	-	-	0.050	U	-	**269**	-	-	**152**	-	-	**0.28**	-	-	**70.6**	-	-	**182**	-	-
DC-03	YVD-092617-22	9/26/2017	N	K1710333	**329**	-	-	**329**	-	-	-	-	-	0.050	U	-	**279**	-	-	**154**	-	-	**0.24**	-	-	**68.9**	-	-	**192**	-	-
DC-03	YVD-120417-10	12/4/2017	N	K1713026	**333**	-	-	**333**	-	-	-	-	-	0.050	U	-	**274**	-	-	**161**	-	-	**0.24**	-	-	**69.4**	-	-	**207**	-	-
DC-03	YVD-031818-04	3/18/2018	N	870610	**374**	-	-	**374**	-	-	0.070	U	-	-	-	-	**280**	-	-	**156**	-	-	**0.19**	-	-	**67.00**	-	-	**192**	-	-
DC-03	YVD-060418-22	6/4/2018	N	874860	**358**	-	-	**358**	-	-	**1.22**	-	-	-	-	-	**266**	-	-	**152**	-	-	**0.19**	-	-	**67.00**	-	-	**184**	-	-
DC-03	YVD-090918-17	9/9/2018	N	880601	**460**	-	-	**460**	-	-	0.070	U	-	-	-	-	**267**	-	-	**133**	-	-	**0.20**	-	-	**65.50**	-	-	**157**	-	-
DC-03	YVD-121018-03	12/10/2018	N	884857	**415**	-	-	**415**	-	-	0.070	U	-	-	-	-	**263**	-	-	**142**	-	-	0.20	U	FBK	**65.50**	J	MSD	**180**	-	-
DC-03	YVD-031819-19	3/18/2019	N	988273	**435**	-	-	**435**	-	-	0.070	U	-	-	-	-	**276**	-	-	**150**	-	-	**0.19**	-	-	**66.00**	-	-	**186**	-	-
DC-03	YVD-060419-32	6/4/2019	N	992242	**406**	-	-	**406**	-	-	**0.27**	-	-	-	-	-	**282**	-	-	**155**	-	-	**0.27**	-	-	**70.00**	-	-	**178**	-	-
DC-03	YVD-091019-23	9/10/2019	N	998438	**463**	-	-	**463**	-	-	0.070	U	-	-	-	-	**285**	-	-	**132**	-	-	**0.15**	-	-	**74.00**	-	-	**180**	-	-
DC-03	YVD-121019-22	12/10/2019	N	902321	**433**	-	-	**433**	-	-	0.070	U	-	-	-	-	**261**	-	-	**121**	-	-	**0.17**	-	-	**65.50**	-	-	**175**	-	-
DC-03	YVD-033120-22	3/31/2020	N	006260	**418**	-	-	**418**	-	-	0.070	U	-	-	-	-	**284**	-	-	**136**	-	-	**0.17**	-	-	**71.00**	-	-	**166**	-	-
DC-03	YVD-060920-26	6/9/2020	N	009269	**426**	-	-	**426**	-	-	0.070	U	-				**298**	-	-	**163**	-	-	**0.14**	-	-	**75.00**	-	-	**205**	-	-
DC-03	YVD-092120-21	9/21/2020	N	013896	**429**	-	-	**429**	-	-	0.070	U	-	-	-	-	**284**	-	-	**140**	-	-	**0.24**	-	-	**73.50**	-	-	**177**	-	-
DC-03	YVD-120720-05	12/7/2020	N	017035	**430**	-	-	**430**	-	-	0.070	U	-	-	-	-	**260**	-	-	**122**	-	-	**0.15**	-	-	**64.50**	-	-	**144**	-	-
DC-03	YVD-120720-07	12/7/2020	FD	017035	**431**	-	-	**431**	-	-	0.070	U	-	-	-	-	**256**	-	-	**122**	-	-	**0.15**	-	-	**64.50**	-	-	**153**	-	-
DC-03	YVD-030221-23	3/2/2021	N	120034	**393**	-	-	**393**	-	-	0.070	U	-	-	-	-	**286**	-	-	**141**	-	-	**0.17**	-	-	**69.00**	-	-	**186**	-	-
DC-03	YVD-060821-27	6/8/2021	N	124212	**406**	-	-	**406**	-	-	0.070	U	-	-	-	-	**280**	-	-	**150**	-	-	0.10	U	-	**69.50**	-	-	**185**	-	-
DC-03	YVD-031522-10	3/15/2022	N	K2202727	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**182**	-	-
DC-03	YVD-031522-11	3/15/2022	FD	K2202727	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**183**	-	-
DC-03	YVD-060522-10	6/5/2022	N	K2206116	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**157**	-	-
DC-03D	DC-03D-130918	09/18/2013	N	SWI0138	**509**	-	-	**510**	-	-	-	-	-	0.1	U	-	**198**	-	-	**56**	-	-	5	U	-	**44.0**	-	-	**46.4**	-	-
DC-03D	DC-03D-131212	12/12/2013	N	SWL0073	**559**	-	-	**560**	-	-	-	-	-	0.02	UJ	MSD	**194**	-	-	**67.9**	-	-	5	U	-	**43.3**	-	-	**38.9**	-	-
DC-03D	DC-03D-140319	03/19/2014	N	SXC0107	**564**	-	-	**565**	-	-	-	-	-	**0.127**	-	-	**200**	-	-	**65.9**	-	-	5	U	-	**43.9**	-	-	**42.5**	-	-
DC-03D	DC-03D-140603	06/03/2014	N	SXF0017	**542**	-	-	**543**	-	-	-	-	-	0.1	U	-	**179**	-	-	**65.5**	-	-	2	U	-	**40.9**	-	-	**42**	-	-
DC-03D	DC-03D-140923	09/23/2014	N	SXI0173	**514**	-	-	**515**	-	-	-	-	-	0.1	U	-	**216**	-	-	**59.5**	-	-	2.5	U	-	**46.6**	-	-	**38**	-	-
DC-03D	DC-03D-141217	12/17/2014	N	SXL0121	**514**	-	-	**515**	-	-	-	-	-	0.1	U	-	**203**	-	-	**62.8**	-	-	2.5	U	-	**46.8**	-	-	**38.6**	-	-
DC-03D	DC-03D-150317	03/17/2015	N	5904651	**530**	-	-	**530**	-	-	-	-	-	0.1	U	-	**210**	-	-	**63**	-	-	2.5	U	-	**48.0**	-	-	**37**	-	-
DC-03D	DC-03D-150617	06/17/2015	N	59011021	**530**	-	-	**530**	-	-	-	-	-	0.1	U	-	**210**	-	-	**71**	-	-	2.5	U	-	**48.0**	J	RPD	**42**	J-	MSD
DC-03D	DC-03D-150925	09/25/2015	N	59020431	**610**	-	-	**610**	-	-	-	-	-	0.1	U	-	**200**	-	-	**58**	-	-	10	U	-	**47.0**	-	-	**33**	-	-
DC-03D	DC-03D-151216	12/16/2015	N	59025501	**590**	-	-	**590**	-	-	-	-	-	-	R	MSD	**210**	-	-	**70**	-	-	2.5	U	-	**50.0**	-	-	**36**	-	-
DC-03D	DC-03D-160310	03/10/2016	N	59029941	**580**	-	-	**580**	-	-	-	-	-	0.1	U	-	**200**	-	-	**65**	-	-	2.5	U	-	**47.0**	-	-	**37**	-	-
DC-03D	DC-03D-160623	6/23/2016	N	59037371	**530**	-	-	**530**	-	-	-	-	-	**0.11**	J-	MSD	**200**	-	-	**65**	-	-	5	U	-	**47.0**	-	-	**36**	-	-
DC-03D	DC-03D-160927	9/27/2016	N	K1611565	**546**	-	-	**546**	-	-	-	-	-	0.050	U	MBK	**188**	-	-	**58.7**	-	-	**0.10**	J	-	**47.1**	-	-	**32.8**	-	-
DC-03D	DC-03D-161212	12/12/2016	N	K1615029	**544**	-	-	**544**	-	-	-	-	-	0.050	U	-	**200**	-	-	**57.8**	-	-	**0.12**	J	-	**44.8**	-	-	**33.8**	J	HTQ
DC-03D	YVD-030817-14	3/8/2017	N	K1702324	**537**	-	-	**537**	-	-	-	-	-	1	U	-	**196**	-	-	**59.5**	-	-	**0.16**	J	-	**43.4**	-	-	**32.9**	-	-

Table 8
Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3-G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-03D	YVD-030817-16	3/8/2017	FD	K1702324	**555**	-	-	**555**	-	-	-	-	-	1	U	-	**194**	-	-	**59.1**	-	-	**0.17**	J	-	**42.7**	-	-	**32.8**	-	-
DC-03D	YVD-060517-09	6/5/2017	N	K1705702	**533**	-	-	**533**	-	-	-	-	-	0.050	U	-	**203**	-	-	**58.7**	-	-	**0.13**	J	-	**41.3**	-	-	**31.9**	-	-
DC-03D	YVD-092617-24	9/26/2017	N	K1710333	**537**	-	-	**537**	-	-	-	-	-	0.050	U	-	**194**	-	-	**60.1**	-	-	**0.12**	J	-	**44.2**	-	-	**33.2**	-	-
DC-03D	YVD-120417-08	12/4/2017	N	K1713026	**525**	-	-	**525**	-	-	-	-	-	0.050	U	-	**195**	-	-	**57.9**	-	-	**0.17**	J	-	**41.5**	-	-	**33.6**	-	-
DC-03D	YVD-031818-02	3/18/2018	N	870610	**529**	-	-	**529**	-	-	0.070	U	-	-	-	-	**199**	-	-	**66.1**	-	-	0.10	U	-	**42.65**	-	-	**32.6**	-	-
DC-03D	YVD-060418-24	6/4/2018	N	874860	**533**	-	-	**533**	-	-	0.070	U	-	-	-	-	**187**	-	-	**64.7**	-	-	**0.10**	-	-	**42.85**	-	-	**31.0**	-	-
DC-03D	YVD-090918-15	9/9/2018	N	880601	**541**	-	-	**541**	-	-	0.070	U	-	-	-	-	**200**	-	-	**69.5**	-	-	**0.10**	-	-	**42.90**	-	-	**32.9**	-	-
DC-03D	YVD-121018-05	12/10/2018	N	884857	**543**	-	-	**543**	-	-	0.070	U	-	-	-	-	**191**	-	-	**62.1**	-	-	0.10	U	FBK	**42.50**	J	MSD	**34.8**	-	-
DC-03D	YVD-031819-17	3/18/2019	N	988273	**536**	-	-	**536**	-	-	0.070	U	-	-	-	-	**192**	-	-	**61.4**	-	-	**0.13**	-	-	**41.55**	-	-	**35.4**	-	-
DC-03D	YVD-060419-30	6/4/2019	N	992242	**499**	-	-	**499**	-	-	0.070	U	-	-	-	-	**186**	-	-	**59.6**	-	-	0.10	U	-	**40.35**	-	-	**36.6**	-	-
DC-03D	YVD-060419-31	6/4/2019	FD	992242	**494**	-	-	**494**	-	-	0.070	U	-	-	-	-	**182**	-	-	**60.6**	-	-	0.10	U	-	**40.70**	-	-	**37.2**	-	-
DC-03D	YVD-091019-21	9/10/2019	N	998438	**506**	-	-	**506**	-	-	0.070	U	-	-	-	-	**186**	-	-	**58.4**	-	-	0.10	U	-	**40.95**	-	-	**36.4**	-	-
DC-03D	YVD-091019-22	9/10/2019	FD	998438	**514**	-	-	**514**	-	-	0.070	U	-	-	-	-	**186**	-	-	**58.3**	-	-	0.10	U	-	**41.15**	-	-	**36.5**	-	-
DC-03D	YVD-121019-20	12/10/2019	N	902321	**502**	-	-	**502**	-	-	0.070	U	-	-	-	-	**182**	-	-	**65.0**	-	-	0.10	U	-	**39.85**	-	-	**36.2**	-	-
DC-03D	YVD-033120-20	3/31/2020	N	006260	**456**	-	-	**456**	-	-	0.070	U	-	-	-	-	**175**	-	-	**58.5**	-	-	0.10	U	-	**38.40**	-	-	**39**	-	-
DC-03D	YVD-061020-34	6/10/2020	N	009361	**458**	-	-	**458**	-	-	0.070	U	-	-	-	-	**168**	-	-	**60.8**	-	-	0.10	U	-	**36.20**	J	MS	**37**	-	-
DC-03D	YVD-092120-19	9/21/2020	N	013896	**460**	-	-	**460**	-	-	0.070	U	-	-	-	-	**176**	-	-	**68.9**	-	-	0.10	U	-	**38.30**	-	-	**38.5**	-	-
DC-03D	YVD-120720-09	12/7/2020	N	017035	**452**	-	-	**452**	-	-	0.070	U	-	-	-	-	**174**	-	-	**66.3**	-	-	**0.15**	-	-	**38.60**	-	-	**35.8**	-	-
DC-03D	YVD-030221-21	3/2/2021	N	120034	**481**	-	-	**481**	-	-	0.070	U	-	-	-	-	**181**	-	-	**69.6**	-	-	0.10	U	-	**39.15**	-	-	**39.8**	-	-
DC-03D	YVD-030221-21	3/2/2021	N	120034	**481**	-	-	**481**	-	-	0.070	U	-	-	-	-	**181**	-	-	**69.6**	-	-	0.10	U	-	**39.15**	-	-	**39.8**	-	-
DC-03D	YVD-060821-29	6/8/2021	N	124212	**456**	-	-	**456**	-	-	0.070	U	-	-	-	-	**175**	-	-	**66.8**	-	-	0.10	U	-	**39.00**	-	-	**41.4**	-	-
DC-03D	YVD-060821-31	6/8/2021	FD	124212	**455**	-	-	**455**	-	-	0.070	U	-	-	-	-	**174**	-	-	**66.7**	-	-	0.10	U	-	**38.35**	-	-	**39.9**	-	-
DC-03D	YVD-121421-10	12/14/2021	N	K2114499	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**35.1**	-	-
DC-03D	YVD-031422-08	3/14/2022	N	K2202633	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**41.6**	-	-
DC-03D	YVD-060522-11	6/5/2022	N	K2206116	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**39.1**	-	-
DC-04	DC-04-130103	01/03/2013	N	EPA01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**26.0**	-	-
DC-04	DC-04-130920	09/20/2013	N	SWI0142	**305**	-	-	**305**	-	-	-	-	-	0.1	U	-	**141**	-	-	**39.4**	-	-	5	U	-	**25.5**	-	-	-	-	-
DC-04	DC-04-130924	09/24/2013	N	SWI0175	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**31.7**	-	-
DC-04	DC-04-131212	12/12/2013	N	SWL0073	**315**	-	-	**315**	-	-	-	-	-	0.02	UJ	MSD	**148**	-	-	**41.1**	-	-	5	U	-	**28.4**	-	-	**36.7**	-	-
DC-04	DC-04-140318	03/18/2014	N	SXC0107	**325**	-	-	**325**	-	-	-	-	-	0.1	U	-	**153**	-	-	**42**	-	-	5	U	-	**28.0**	-	-	**37.3**	-	-
DC-04	DC-04-140603	06/03/2014	N	SXF0017	**310**	-	-	**310**	-	-	-	-	-	0.1	U	-	**134**	-	-	**36.2**	-	-	2	U	-	**28.9**	-	-	**36.4**	-	-
DC-04	DC-04-140923	09/23/2014	N	SXI0173	**317**	-	-	**320**	-	-	-	-	-	0.1	U	-	**174**	-	-	**39.7**	-	-	2.5	U	-	**34.2**	-	-	**37.8**	-	-
DC-04	DC-04-141217	12/17/2014	N	SXL0121	**329**	-	-	**330**	-	-	-	-	-	0.1	U	-	**182**	-	-	**42.7**	-	-	2.5	U	-	**35.7**	-	-	**40.8**	-	-
DC-04	DC-04-150317	03/17/2015	N	5904651	**340**	-	-	**340**	-	-	-	-	-	0.1	U	-	**180**	-	-	**41**	-	-	2.5	U	-	**34.0**	-	-	**39**	-	-
DC-04	DC-04-150617	06/17/2015	N	59010961	**330**	-	-	**330**	-	-	-	-	-	0.1	U	-	**180**	-	-	**46**	-	-	5	U	-	**34.0**	-	-	**42**	-	-
DC-04	DC-04-150924	09/24/2015	N	59020391	**400**	-	-	**400**	-	-	-	-	-	0.1	UJ	MSD	**160**	-	-	**48**	-	-	2.5	U	-	**36.0**	-	-	**48**	J+	MSD
DC-04	YVD-D3-150924	09/24/2015	FD	59020391	**380**	-	-	**380**	-	-	-	-	-	0.1	UJ	MSD	**170**	-	-	**53**	-	-	2.5	U	-	**37.0**	-	-	**53**	J+	MSD
DC-04	DC-04-151215	12/15/2015	N	59025431	**400**	J	FDP	**400**	J	FDP	-	-	-	-	R	MSD	**180**	-	-	**46**	-	-	2.5	U	-	**36.0**	-	-	**48**	-	-
DC-04	DC-04-160309	03/09/2016	N	59029711	**390**	-	-	**390**	-	-	-	-	-	0.1	UJ	FDP	**190**	-	-	**53**	-	-	2.5	U	-	**36.0**	-	-	**53**	-	-
DC-04	DC-04-160621	6/21/2016	N	59037271	**360**	-	-	**360**	-	-	-	-	-	0.1	UJ	MSD	**200**	-	-	**50**	-	-	2.5	U	-	**40.0**	-	-	**50**	-	-
DC-04	DC-04-160926	9/26/2016	N	K1611506	**374**	-	-	**374**	-	-	-	-	-	0.050	U	MBK	**194**	-	-	**43.4**	-	-	**0.12**	J	-	**40.6**	-	-	**44.1**	-	-
DC-04	DC-04-161216	12/12/2016	N	K1615174	**384**	-	-	**384**	-	-	-	-	-	0.050	U	-	**214**	-	-	**44.7**	-	-	**0.15**	J	-	**39.7**	-	-	**45.2**	-	-
DC-04	YVD-031017-31	3/10/2017	N	K1702448	**375**	-	-	**375**	-	-	-	-	-	0.050	U	-	**219**	-	-	**43.1**	-	-	**0.16**	J	-	**36.3**	-	-	**46.0**	-	-
DC-04	YVD-031017-33	3/10/2017	FD	K1702448	**383**	-	-	**383**	-	-	-	-	-	0.050	U	-	**219**	-	-	**43.2**	-	-	**0.16**	J	-	**36.3**	-	-	**45.7**	-	-
DC-04	YVD-060617-26	6/6/2017	N	K1705833	**390**	-	-	**390**	-	-	-	-	-	0.050	U	-	**202**	-	-	**38.6**	-	-	**0.13**	J	-	**37.0**	-	-	**38.4**	-	-
DC-04	YVD-092517-06	9/25/2017	N	K1710274	**391**	-	-	**391**	-	-	-	-	-	0.050	U	-	**192**	-	-	**35.2**	-	-	**0.14**	J	-	**37.0**	-	-	**33.7**	-	-
DC-04	YVD-120517-24	12/5/2017	N	K1713091	**388**	-	-	**388**	-	-	-	-	-	0.050	U	-	**188**	-	-	**34.3**	-	-	**0.12**	J	-	**32.7**	-	-	**33.8**	J	HTQ
DC-04	YVD-031818-07	3/18/2018	N	870610	**377**	-	-	**377**	-	-	0.070	U	-	-	-	-	**182**	-	-	**34.5**	-	-	0.10	U	-	**32.10**	-	-	**32.9**	-	-

Table 8
Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3-G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-04	YVD-060418-18	6/4/2018	N	874662	**380**	-	-	**380**	-	-	0.070	U	FBK	-	-	-	**182**	-	-	**35.4**	-	-	**0.10**	-	-	**33.55**	-	-	**33.0**	-	-
DC-04	YVD-090918-18	9/9/2018	N	880601	**371**	-	-	**371**	-	-	0.070	U	-	-	-	-	**176**	-	-	**32.4**	-	-	**0.12**	-	-	**30.40**	-	-	**30.4**	-	-
DC-04	YVD-121118-18	12/11/2018	N	884939	**376**	-	-	**376**	-	-	0.070	U	-	-	-	-	**166**	-	-	**30.4**	-	-	**0.11**	-	-	**29.40**	-	-	**29.4**	-	-
DC-04	YVD-032019-21	3/20/2019	N	988477	**393**	-	-	**393**	-	-	0.070	U	-	-	-	-	**172**	-	-	**26.2**	-	-	**0.10**	-	-	**30.45**	-	-	**29.6**	-	-
DC-04	YVD-060219-14	6/2/2019	N	991939	**390**	-	-	**390**	-	-	**0.09**	-	-	-	-	-	**173**	-	-	22.9	U	FBK	0.10	U	-	**30.55**	-	-	**29.1**	-	-
DC-04	YVD-090919-09	9/9/2019	N	998357	**387**	-	-	**387**	-	-	0.070	U	-	-	-	-	**169**	-	-	**33.1**	-	-	0.10	U	-	**30.35**	-	-	**31.4**	-	-
DC-04	YVD-120919-07	12/9/2019	N	902276	**382**	-	-	**382**	-	-	0.070	U	-	-	-	-	**167**	-	-	**33.4**	-	-	0.10	U	-	**30.35**	-	-	**31.3**	-	-
DC-04	YVD-033120-18	3/31/2020	N	006260	**390**	-	-	**390**	-	-	0.070	U	-	-	-	-	**171**	-	-	**34.1**	-	-	**0.10**	-	-	**30.50**	-	-	**29.8**	-	-
DC-04	YVD-060820-08	6/8/2020	N	009144	**395**	-	-	**395**	-	-	0.070	U	-	-	-	-	**173**	-	-	**34.5**	-	-	**0.10**	-	-	**31.00**	-	-	**30.9**	-	-
DC-04	YVD-092020-07	9/20/2020	N	013864	**403**	-	-	**403**	-	-	0.070	U	-	-	-	-	**184**	-	-	**39.4**	-	-	0.10	U	-	**33.35**	-	-	**34.1**	-	-
DC-04	YVD-120820-23	12/8/2020	N	017137	**422**	-	-	**422**	-	-	0.070	U	-	-	-	-	**193**	-	-	**41.3**	-	-	0.10	U	-	**34.65**	-	-	**34.4**	-	-
DC-04	YVD-030221-20	3/2/2021	N	120034	**443**	-	-	**443**	-	-	0.070	U	-	-	-	-	**208**	-	-	**46.2**	-	-	**0.15**	-	-	**36.15**	-	-	**35**	-	-
DC-04	YVD-030221-22	3/2/2021	FD	120034	**440**	-	-	**440**	-	-	0.070	U	-	-	-	-	**200**	-	-	**45.7**	-	-	**0.15**	-	-	**35.70**	-	-	**34.3**	-	-
DC-04	YVD-030221-20	3/2/2021	N	120034	**443**	-	-	**443**	-	-	0.070	U	-	-	-	-	**208**	-	-	**46.2**	-	-	**0.15**	-	-	**36.15**	-	-	**35**	-	-
DC-04	YVD-030221-22	3/2/2021	FD	120034	**440**	-	-	**440**	-	-	0.070	U	-	-	-	-	**200**	-	-	**45.7**	-	-	**0.15**	-	-	**35.70**	-	-	**34.3**	-	-
DC-04	YVD-060621-06	6/6/2021	N	124053	**438**	-	-	**438**	-	-	0.070	U	-	-	-	-	**195**	-	-	**39.6**	-	-	0.10	U	-	**34.75**	-	-	**30.9**	-	-
DC-04	YVD-121521-21	12/15/2021	N	K2114550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**32.7**	J	HTQ, MS
DC-04	YVD-031522-15	3/15/2022	N	K2202727	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**35.3**	-	-
DC-04	YVD-060522-05	6/5/2022	N	K2206116	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**34.5**	-	-
DC-05	DC-05-130104	01/04/2013	N	EPA01	-		-	-		-	-	-	-	-		-	-		-	-		-	-		-	-		-	**32**		-
DC-05	DC-05-130920	09/20/2013	N	SWI0142	**414**		-	**415**		-	-	-	-	**0.255**		-	**129**		-	**36.7**		-	5	U	-	**48.5**		-	-		-
DC-05	DC-05-130924	09/24/2013	N	SWI0175	-		-	-		-	-	-	-	-		-	-		-	-		-	-		-	-		-	**33.6**		-
DC-05	DC-05-131212	12/12/2013	N	SWL0073	**424**	-	-	**425**	-	-	-	-	-	0.02	UJ	MSD	**130**	-	-	**35.9**	-	-	5	U	-	**50.2**	-	-	**42.6**	-	-
DC-05	DC-05-140318	03/18/2014	N	SXC0107	**404**	-	-	**405**	-	-	-	-	-	**0.131**	-	-	**133**	-	-	**33**	-	-	5	U	-	**49.7**	-	-	**33.1**	-	-
DC-05	DC-05-140603	06/03/2014	N	SXF0017	**412**	-	-	**413**	-	-	-	-	-	0.1	U	-	**118**	-	-	**31.6**	-	-	2	U	-	**46.7**	-	-	**32.6**	-	-
DC-05	DC-05-140923	09/23/2014	N	SXI0173	**408**	-	-	**410**	-	-	-	-	-	0.1	U	-	**140**	-	-	**35**	-	-	2.5	U	-	**53.5**	-	-	**35.8**	-	-
DC-05	DC-05-141217	12/17/2014	N	SXL0121	**414**	-	-	**415**	-	-	-	-	-	0.1	U	-	**147**	-	-	**34.4**	-	-	2.5	U	-	**58.9**	-	-	**33.4**	-	-
DC-05	DC-05-150317	03/17/2015	N	5904541	**430**	-	-	**430**	-	-	-	-	-	0.1	U	-	**150**	-	-	**36**	-	-	**2**	-	-	**58.0**	-	-	**38**	J-	MSD
DC-05	DC-05-150616	06/16/2015	N	59010961	**410**	-	-	**410**	-	-	-	-	-	0.1	U	-	**140**	-	-	**35**	-	-	2	U	-	**57.0**	-	-	**37**	-	-
DC-05	YVD-D2-150616	06/16/2015	FD	59010961	**410**	-	-	**410**	-	-	-	-	-	0.1	U	-	**140**	-	-	**35**	-	-	5	U	-	**56.0**	-	-	**41**	-	-
DC-05	DC-05-150923	09/23/2015	N	59020391	**440**	-	-	**440**	-	-	-	-	-	0.1	UJ	MSD	**130**	-	-	**33**	-	-	2	U	-	**57.0**	-	-	**38**	J+	MSD
DC-05	DC-05-151215	12/15/2015	N	59025431	**440**	J	FDP	**440**	J	FDP	-	-	-	-	R	MSD	**140**	-	-	**29**	-	-	2	U	-	**55.0**	-	-	**38**	-	-
DC-05	DC-05-160309	03/09/2016	N	59029711	**410**	-	-	**410**	-	-	-	-	-	0.1	UJ	FDP	**140**	-	-	**35**	-	-	2	U	-	**54.0**	-	-	**43**	-	-
DC-05	DC-05-160621	6/21/2016	N	59037151	**390**	-	-	**390**	-	-	-	-	-	0.1	UJ	-	**130**	-	-	**34**	-	-	2	U	-	**54.0**	-	-	**36**	-	-
DC-05	DC-05-160926	9/26/2016	N	K1611506	**346**	-	-	**346**	-	-	-	-	-	0.050	U	-	**119**	-	-	**26.5**	-	-	**0.15**	J	-	**49.7**	-	-	**32.1**	-	-
DC-05	DC-05-D1-160926	9/26/2016	FD	K1611506	**364**	-	-	**364**	-	-	-	-	-	0.050	U	MBK	**124**	-	-	**26.6**	-	-	**0.16**	J	-	**52.5**	-	-	**32.2**	-	-
DC-05	DC-05-161216	12/16/2016	N	K1615174	**348**	-	-	**348**	-	-	-	-	-	0.050	U	-	**129**	-	-	**28.6**	-	-	**0.19**	J	-	**45.4**	-	-	**33.7**	-	-
DC-05	YVD-D5-161216	12/16/2016	FD	K1615174	**340**	-	-	**340**	-	-	-	-	-	0.050	U	-	**128**	-	-	**28.9**	-	-	**0.19**	J	-	**48.0**	-	-	**33.3**	-	-
DC-05	YVD-030717-09	3/7/2017	N	K1702324	**367**	-	-	**367**	-	-	-	-	-	1	U	-	**117**	-	-	**28.5**	-	-	**0.20**	J	-	**43.5**	-	-	**32.9**	J	HTQ
DC-05	YVD-060717-30	6/7/2017	N	K1705833	**364**	-	-	**364**	-	-	-	-	-	0.050	U	-	**122**	-	-	**26.8**	-	-	**0.16**	J	-	**47.1**	-	-	**30.8**	-	-
DC-05	YVD-060717-32	6/7/2017	FD	K1705833	**364**	-	-	**364**	-	-	-	-	-	0.050	U	-	**122**	-	-	**26.3**	-	-	**0.16**	J	-	**45.8**	-	-	**30.7**	-	-
DC-05	YVD-092517-04	9/25/2017	N	K1710274	**368**	-	-	**368**	-	-	-	-	-	0.050	U	-	**126**	-	-	**28.1**	-	-	**0.19**	J	-	**49.7**	-	-	**30.7**	-	-
DC-05	YVD-120517-16	12/5/2017	N	K1713091	**364**	-	-	**364**	-	-	-	-	-	0.050	U	-	**119**	-	-	**31.9**	-	-	**0.18**	J	-	**42.5**	-	-	**34.5**	J	HTQ
DC-05	YVD-120517-18	12/5/2017	FD	K1713091	**366**	-	-	**366**	-	-	-	-	-	0.050	U	-	**120**	-	-	**31.3**	-	-	**0.19**	J	-	**43.1**	-	-	**33.9**	J	HTQ
DC-05	YVD-031818-03	3/18/2018	N	870610	**364**	-	-	**364**	-	-	**0.10**	-	-	-	-	-	**116**	-	-	**33.0**	-	-	0.14	U	-	**42.35**	-	-	**33.6**	-	-
DC-05	YVD-031818-05	3/18/2018	FD	870610	**356**	-	-	**356**	-	-	0.070	U	-	-	-	-	**116**	-	-	**33.1**	-	-	**0.14**	-	-	**42.85**	-	-	**33.8**	-	-
DC-05	YVD-060318-02	6/3/2018	FD	874568	**368**	-	-	**368**	-	-	0.070	U	-	-	-	-	**118**	-	-	**32.2**	-	-	**0.15**	-	-	**43.50**	-	-	**34.4**	-	-
DC-05	YVD-090918-03	9/9/2018	N	880601	**378**	-	-	**378**	-	-	0.070	U	-	-	-	-	**122**	-	-	**31.4**	-	-	**0.18**	-	-	**42.55**	-	-	**31.5**	-	-

Table 8
Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3-G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-05	YVD-121118-16	12/11/2018	N	884939	**390**	-	-	**390**	-	-	0.070	U	-	-	-	-	**120**	-	-	**33.7**	-	-	**0.16**	-	-	**43.40**	-	-	**33.2**	-	-
DC-05	YVD-031719-02	3/17/2019	N	988239	**396**	-	-	**396**	-	-	0.070	U	-	-	-	-	**126**	-	-	**29.9**	-	-	0.12	U	FBK	**44.25**	-	-	**30.4**	-	-
DC-05	YVD-060219-08	6/2/2019	N	991939	**400**	-	-	**400**	-	-	0.070	U	-	-	-	-	**122**	-	-	26.2	U	FBK	0.12	U	FBK	**44.15**	-	-	**28.8**	-	-
DC-05	YVD-090919-14	9/9/2019	N	998357	**389**	-	-	**389**	-	-	0.070	U	-	-	-	-	**120**	-	-	**25.4**	-	-	**0.14**	-	-	**42.30**	-	-	**26.7**	-	-
DC-05	YVD-120919-03	12/9/2019	N	902276	**400**	-	-	**400**	-	-	0.070	U	-	-	-	-	**120**	-	-	**28.1**	-	-	**0.14**	-	-	**43.00**	-	-	**29.3**	-	-
DC-05	YVD-033020-12	3/30/2020	N	006241	**402**	-	-	**402**	-	-	0.070	U	-	-	-	-	**120**	-	-	**26.0**	-	-	**0.14**	-	-	**43.45**	-	-	**25.6**	-	-
DC-05	YVD-060820-06	6/8/2020	N	009144	**404**	-	-	**404**	-	-	0.070	U	-	-	-	-	**116**	-	-	**24.4**	-	-	**0.16**	-	-	**41.75**	-	-	**24**	-	-
DC-05	YVD-092020-03	9/20/2020	N	013864	**387**	-	-	**387**	-	-	0.070	U	-	-	-	-	**126**	-	-	**26.8**	-	-	**0.12**	-	-	**45.05**	-	-	**27.8**	-	-
DC-05	YVD-120720-06	12/7/2020	N	017035	**372**	-	-	**372**	-	-	0.070	U	-	-	-	-	**130**	-	-	**24.0**	-	-	**0.12**	-	-	**47.55**	-	-	**29.6**	-	-
DC-05	YVD-030221-16	3/2/2021	N	120034	**388**	-	-	**388**	-	-	0.070	U	-	-	-	-	**139**	-	-	**30.5**	-	-	**0.12**	-	-	**49.25**	-	-	**32.3**	-	-
DC-05	YVD-060721-14	6/7/2021	N	124105	**360**	-	-	**360**	-	-	0.070	U	-	-	-	-	**129**	-	-	**34.9**	-	-	**0.17**	-	-	**46.45**	-	-	**38.5**	-	-
DC-05	YVD-121521-15	12/15/2021	N	K2114550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**43.5**	J	HTQ, MS
DC-05	YVD-031422-04	3/14/2022	N	K2202633	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**35.9**	-	-
DC-05	YVD-060522-02	6/5/2022	N	K2206116	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**41.7**	-	-
DC-05	YVD-060522-03	6/5/2022	FD	K2206116	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**40.6**	-	-
DC-05D	DC-05D-130920	09/20/2013	N	SWI0142	**214**	-	-	**215**	-	-	-	-	-	0.1	U	-	**86.7**	-	-	**43.6**	-	-	5	U	-	**30.3**	-	-	-	-	-
DC-05D	DC-05D-130924	09/24/2013	N	SWI0178	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**14.6**	-	-
DC-05D	DC-05D-131211	12/11/2013	N	SWL0073	**209**	-	-	**210**	-	-	-	-	-	0.02	UJ	MSD	**81.8**	-	-	**32.3**	-	-	5	U	-	**28.8**	-	-	**16**	-	-
DC-05D	DC-05D-140318	03/18/2014	N	SXC0095	**209**	-	-	**210**	-	-	-	-	-	**0.182**	-	-	**86.2**	-	-	**33.4**	-	-	5	U	-	**29.4**	-	-	**12.8**	-	-
DC-05D	DC-05D-140602	06/02/2014	N	SXF0017	**214**	-	-	**215**	-	-	-	-	-	**0.163**	-	-	**67.4**	-	-	**30.6**	-	-	2	U	-	**24.6**	-	-	**3.36**	-	-
DC-05D	DC-05D-140922	09/22/2014	N	SXI0148	**203**	-	-	**205**	-	-	-	-	-	0.1	U	-	**83.3**	-	-	**30.9**	-	-	2	U	-	**30.2**	-	-	**11.7**	-	-
DC-05D	DC-05D-141216	12/16/2014	N	SXL0121	**199**	-	-	**200**	-	-	-	-	-	0.1	U	-	**78.9**	-	-	**35.9**	-	-	5	U	-	**29.5**	-	-	**7.9**	-	-
DC-05D	DC-05D-150317	03/17/2015	N	5904541	**210**	-	-	**210**	-	-	-	-	-	0.1	U	-	**78.0**	-	-	**31**	-	-	2	U	-	**29.0**	-	-	**7.7**	J-	MSD
DC-05D	DC-05D-150616	06/16/2015	N	59010961	**210**	-	-	**210**	-	-	-	-	-	0.1	U	-	**79.0**	-	-	**34**	-	-	2	U	-	**30.0**	-	-	**8.6**	-	-
DC-05D	DC-05D-150923	09/23/2015	N	59020391	**200**	-	-	**200**	-	-	-	-	-	0.1	UJ	MSD	**74.0**	-	-	**31**	-	-	2	U	-	**31.0**	-	-	**8.9**	J+	MSD
DC-05D	YVD-D2-150923	09/23/2015	FD	59020391	**220**	-	-	**220**	-	-	-	-	-	**0.16**	J	MSD	**73.0**	-	-	**33**	-	-	0.5	U	-	**30.0**	-	-	**10**	J+	MSD
DC-05D	DC-05D-151215	12/15/2015	N	59025431	**230**	J	FDP	**230**	J	FDP	-	-	-	-	R	MSD	**78.0**	-	-	**30**	-	-	2	U	-	**29.0**	-	-	**9.9**	-	-
DC-05D	DC-05D-160309	03/09/2016	N	59029711	**220**	-	-	**220**	-	-	-	-	-	0.1	UJ	FDP	**81.0**	-	-	**33**	-	-	2	U	-	**30.0**	-	-	**13**	-	-
DC-05D	DC-05D-160621	6/21/2016	N	59037271	**210**	-	-	**210**	-	-	-	-	-	**0.13**	J-	MSD	**78.0**	-	-	**32**	-	-	2	U	-	**30.0**	-	-	**12**	-	-
DC-05D	DC-05D-160926	9/26/2016	N	K1611506	**209**	-	-	**209**	-	-	-	-	-	0.050	U	-	**81.4**	-	-	**25.6**	-	-	**0.26**	-	-	**28.4**	-	-	**11.2**	-	-
DC-05D	DC-05D-161214	12/14/2016	N	K1615126	**202**	-	-	**202**	-	-	-	-	-	0.050	U	-	**78.1**	-	-	**25.7**	-	-	**0.28**	-	-	**27.5**	-	-	**11.2**	-	-
DC-05D	YVD-030717-12	3/7/2017	N	K1702324	**206**	-	-	**206**	-	-	-	-	-	1	U	-	**76.4**	-	-	**26.3**	-	-	**0.32**	-	-	**26.5**	-	-	**11.6**	J	HTQ
DC-05D	YVD-060717-34	6/7/2017	N	K1705833	**201**	-	-	**201**	-	-	-	-	-	0.050	U	-	**79.1**	-	-	**23.9**	-	-	**0.29**	-	-	**27.3**	-	-	**10.8**	-	-
DC-05D	YVD-092517-02	9/25/2017	N	K1710274	**207**	-	-	**207**	-	-	-	-	-	0.050	U	-	**79.2**	-	-	**25.2**	-	-	**0.28**	-	-	**28.9**	-	-	**11.1**	-	-
DC-05D	YVD-092517-03	9/25/2017	FD	K1710274	**207**	-	-	**207**	-	-	-	-	-	0.050	U	-	**80.6**	-	-	**24.9**	-	-	**0.27**	-	-	**29.1**	-	-	**11**	-	-
DC-05D	YVD-120517-20	12/5/2017	N	K1713091	**202**	-	-	**202**	-	-	-	-	-	0.050	U	-	**81.2**	-	-	**26.6**	-	-	**0.28**	-	-	**27.1**	-	-	**11.9**	J	HTQ
DC-05D	YVD-031818-08	3/18/2018	N	870610	**198**	-	-	**198**	-	-	0.07	U	-	-	-	-	**82.0**	-	-	**27.4**	-	-	**0.25**	-	-	**27.50**	-	-	**12.6**	-	-
DC-05D	YVD-060318-03	6/3/2018	N	874568	**203**	-	-	**203**	-	-	0.08	U	FBK	-	-	-	**78.5**	-	-	**27.4**	-	-	**0.35**	-	-	**27.95**	-	-	**12.5**	-	-
DC-05D	YVD-060318-05	6/3/2018	FD	874568	**202**	-	-	**202**	-	-	0.070	U	-	-	-	-	**78.5**	-	-	**27.4**	-	-	**0.26**	-	-	**28.00**	-	-	**13.4**	-	-
DC-05D	YVD-090918-02	9/9/2018	N	880601	**204**	-	-	**204**	-	-	0.070	U	-	-	-	-	**79.5**	-	-	**26.8**	-	-	**0.25**	-	-	**26.75**	-	-	**12.2**	-	-
DC-05D	YVD-121118-14	12/11/2018	N	884939	**204**	-	-	**204**	-	-	0.070	U	-	-	-	-	**78.5**	-	-	**25.7**	-	-	**0.24**	-	-	**26.50**	-	-	**12.4**	-	-
DC-05D	YVD-031719-04	3/17/2019	N	988239	**204**	-	-	**204**	-	-	0.070	U	-	-	-	-	**79.0**	-	-	**26.6**	-	-	0.22	U	FBK	**26.85**	-	-	**12.8**	-	-
DC-05D	YVD-031719-06	3/17/2019	FD	988239	**206**	-	-	**206**	-	-	0.070	U	-	-	-	-	**81.5**	-	-	**26.4**	-	-	0.22	U	FBK	**27.05**	-	-	**12.6**	-	-
DC-05D	YVD-060219-10	6/2/2019	N	991939	**206**	-	-	**206**	-	-	0.070	U	-	-	-	-	**78.0**	-	-	26.0	U	FBK	0.25	U	FBK	**26.70**	-	-	**13.8**	-	-
DC-05D	YVD-090919-12	9/9/2019	N	998357	**205**	-	-	**205**	-	-	0.070	U	-	-	-	-	**78.5**	-	-	**26.5**	-	-	**0.30**	-	-	**26.15**	-	-	**12.5**	-	-
DC-05D	YVD-120919-05	12/9/2019	N	902276	**201**	-	-	**201**	-	-	0.070	U	-	-	-	-	**76.5**	-	-	**26.3**	-	-	**0.28**	-	-	**26.20**	-	-	**12.9**	-	-
DC-05D	YVD-033020-14	3/30/2020	N	006241	**202**	-	-	**202**	-	-	0.070	U	-	-	-	-	**75.5**	-	-	**27.3**	-	-	**0.25**	-	-	**26.30**	-	-	**12.8**	-	-
DC-05D	YVD-060820-02	6/8/2020	N	009144	**202**	-	-	**202**	-	-	0.070	U	-	-	-	-	**76.5**	-	-	**26.9**	-	-	**0.20**	-	-	**26.55**	-	-	**14.4**	-	-

Table 8
Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3-G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-05D	YVD-060820-04	6/8/2020	FD	009144	**202**	-	-	**202**	-	-	0.070	U	-	-	-	-	**76.0**	-	-	**26.9**	-	-	**0.20**	-	-	**26.55**	-	-	**12**	-	-
DC-05D	YVD-092020-04	9/20/2020	N	013864/20I0421	**202**	-	-	**202**	-	-	0.070	U	-	-	-	-	**78.0**	-	-	**27.2**	-	-	**0.21**	-	-	**26.95**	-	-	**12**	-	-
DC-05D	YVD-092020-05	9/20/2020	FD	013864/20I0421	**202**	-	-	**202**	-	-	0.070	U	-	-	-	-	**78.5**	-	-	**27.2**	-	-	**0.22**	-	-	**26.75**	-	-	**12**	-	-
DC-05D	YVD-120720-02	12/7/2020	N	017035	**200**	-	-	**200**	-	-	0.070	U	-	-	-	-	**77.5**	-	-	**23.5**	-	-	**0.20**	-	-	**27.05**	-	-	**12.9**	-	-
DC-05D	YVD-120720-04	12/7/2020	FD	017035	**198**	-	-	**198**	-	-	0.070	U	-	-	-	-	**76.5**	-	-	**21.0**	-	-	**0.18**	-	-	**26.90**	-	-	**12.9**	-	-
DC-05D	YVD-030221-18	3/2/2021	N	120034	**206**	-	-	**206**	-	-	0.070	U	-	-	-	-	**80.5**	-	-	**27.9**	-	-	**0.23**	-	-	**27.10**	-	-	**12.8**	-	-
DC-05D	YVD-060721-13	6/7/2021	N	124105	**212**	-	-	**212**	-	-	0.070	U	-	-	-	-	**78.0**	-	-	**27.2**	-	-	**0.22**	-	-	**26.85**	-	-	**13**	-	-
DC-05D	YVD-121421-04	12/14/2021	N	K2114499	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**12.7**	J	HTQ, MS
DC-05D	YVD-031422-02	3/14/2022	N	K2202633	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**14.2**	-	-
DC-05D	YVD-031422-03	3/14/2022	FD	K2202633	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**14.2**	-	-
DC-05D	YVD-060522-04	6/5/2022	N	K2206116	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**9.83**	-	-
DC-07	DC-07-130103	01/03/2013	N	EPA01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**2.8**	-	-
DC-07	DC-07-130918	09/18/2013	N	SWI0123	**315**	-	-	**315**	-	-	-	-	-	0.1	U	-	**122**	-	-	**30.5**	-	-	5	U	-	**18.4**	-	-	**4.3**	-	-
DC-07	YVD-D1-130918	09/18/2013	FD	SWI0123	**295**	-	-	**295**	-	-	-	-	-	0.1	U	-	**122**	-	-	**32.8**	-	-	5	U	-	**18.5**	-	-	**4.3**	-	-
DC-07	DC-07-131210	12/10/2013	N	SWL0055	**260**	-	-	**260**	-	-	-	-	-	0.02	UJ	MSD	**27.5**	-	-	**31**	-	-	5	U	-	**11.5**	-	-	**4.7**	-	-
DC-07	DC-07-140316	03/16/2014	N	SXC0081	**260**	-	-	**260**	-	-	-	-	-	**0.116**	-	-	**88.4**	-	-	**26.5**	-	-	2	U	-	**15.4**	-	-	**4.72**	-	-
DC-07	DC-07-140602	06/02/2014	N	SXF0008	**245**	-	-	**245**	-	-	-	-	-	0.1	U	-	**93.7**	-	-	**28.2**	-	-	2	U	-	**16.5**	-	-	0.8	U	-
DC-07	DC-07-140922	09/22/2014	N	SXI0148	**215**	-	-	**215**	-	-	-	-	-	0.1	U	-	**87.1**	-	-	**29.8**	-	-	2	U	-	**16.1**	-	-	**4.88**	-	-
DC-07	DC-07-141216	12/16/2014	N	SXL0108	**210**	-	-	**210**	-	-	-	-	-	0.1	U	-	**83.6**	-	-	**24.2**	-	-	2	U	-	**15.1**	-	-	**2.8**	-	-
DC-07	YVD-D2-141216	12/16/2014	FD	SXL0108	**210**	-	-	**210**	-	-	-	-	-	0.1	U	-	**84.2**	-	-	**25.6**	-	-	0.5	U	-	**15.1**	-	-	**2.92**	-	-
DC-07	DC-07-150317	03/17/2015	N	5904541	**240**	-	-	**240**	-	-	-	-	-	0.1	U	-	**94.0**	-	-	**29**	-	-	2	U	-	**17.0**	-	-	**4.6**	J-	MSD
DC-07	DC-07-150617	06/17/2015	N	59011021	**230**	-	-	**230**	-	-	-	-	-	0.1	U	-	**97.0**	-	-	**32**	-	-	2	U	-	**17.0**	J	RPD	**4**	J-	MSD
DC-07	DC-07-150924	09/24/2015	N	59020391	**240**	-	-	**240**	-	-	-	-	-	0.1	UJ	MSD	**76.0**	-	-	**30**	-	-	2	U	-	**15.0**	-	-	**2.7**	J+	MSD
DC-07	DC-07-151215	12/15/2015	N	59025501	**240**	-	-	**240**	-	-	-	-	-	-	R	MSD	**87.0**	-	-	**29**	-	-	2	U	-	**16.0**	-	-	**2.5**	-	-
DC-07	DC-07-160309	03/09/2016	N	59029941	**280**	-	-	**280**	-	-	-	-	-	0.1	U	-	**91.0**	-	-	**31**	-	-	2	U	-	**17.0**	-	-	**2.2**	-	-
DC-07	DC-07-160621	6/21/2016	N	59037271	**250**	-	-	**250**	-	-	-	-	-	**0.1**	J-	MSD	**96.0**	-	-	**33**	-	-	2	U	-	**18.0**	-	-	**4.8**	-	-
DC-07	DC-07-160926	9/26/2016	N	K1611565	**204**	-	-	**204**	-	-	-	-	-	0.050	U	-	**82.3**	-	-	**24.4**	-	-	0.2	U	-	**15.0**	-	-	**2.74**	-	-
DC-07	DC-07-161214	12/14/2016	N	K1615083	**218**	-	-	**218**	-	-	-	-	-	0.050	U	-	**77.0**	-	-	**19.2**	-	-	0.2	U	-	**13.1**	-	-	**1.44**	-	-
DC-07	YVD-030917-25	3/9/2017	N	K1702448	**255**	-	-	**255**	-	-	-	-	-	0.050	U	-	**87.9**	-	-	**21.4**	-	-	0.2	U	-	**14.4**	-	-	**2.58**	-	-
DC-07	YVD-060617-18	6/6/2017	N	K1705754	**232**	-	-	**232**	-	-	-	-	-	0.050	U	-	**82.8**	-	-	**24.5**	-	-	**0.11**	J	-	**14.3**	-	-	**2.42**	-	-
DC-07	YVD-092517-12	9/25/2017	N	K1710333	**235**	-	-	**235**	-	-	-	-	-	0.050	U	-	**86.1**	-	-	**25.4**	-	-	**0.09**	J	-	**13.9**	-	-	**2.34**	-	-
DC-07	YVD-120417-14	12/4/2017	N	K1713026	**221**	-	-	**221**	-	-	-	-	-	0.050	U	-	**80.9**	-	-	**25.7**	-	-	**0.18**	J	-	**13.3**	-	-	**2.92**	-	-
DC-07	YVD-060318-17	6/3/2018	N	874568	**202**	-	-	**202**	-	-	0.070	U	-	-	-	-	**90.5**	-	-	**28.5**	-	-	0.10	U	-	**15.85**	-	-	**6.90**	-	-
DC-07	YVD-060319-20	6/3/2019	N	992053	**349**	-	-	**349**	-	-	0.070	U	-	-	-	-	**120**	-	-	**20.4**	-	-	0.10	U	-	**20.20**	-	-	**2.95**	-	-
DC-07	YVD-060920-18	6/9/2020	N	009269	**468**	-	-	**468**	-	-	0.070	U	-	-	-	-	**174**	-	-	**48.8**	-	-	0.10	U	-	**26.95**	-	-	**10.1**	-	-
DC-07	YVD-092120-22	9/21/2020	N	013896	**500**	-	-	**500**	-	-	0.070	U	-	-	-	-	**194**	-	-	**62.3**	-	-	0.10	U	-	**28.95**	-	-	**26.5**	-	-
DC-07	YVD-120820-22	12/8/2020	N	017137	**507**	-	-	**507**	-	-	0.070	U	-	-	-	-	**172**	-	-	**40.6**	-	-	**0.11**	-	-	**25.95**	-	-	**13.4**	-	-
DC-07	YVD-030121-10	3/1/2021	N	119931	**500**	-	-	**500**	-	-	0.070	U	-	-	-	-	**169**	-	-	**35.1**	-	-	0.10	U	-	**26.60**	-	-	**5.8**	-	-
DC-07	YVD-060721-16	6/7/2021	N	124105	**490**	-	-	**490**	-	-	0.070	U	-	-	-	-	**152**	-	-	**23.1**	-	-	0.10	U	-	**23.55**	-	-	**8.8**	-	-
DC-07	YVD-060721-17	6/7/2021	FD	124105	**490**	-	-	**490**	-	-	0.070	U	-	-	-	-	**150**	-	-	**23.2**	-	-	0.10	U	-	**23.40**	-	-	**9.9**	-	-
DC-07	YVD-121521-17	12/15/2021	N	K2114550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**20.3**	J	HTQ, MS
DC-07	YVD-031522-13	3/15/2022	N	K2202727	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**20.1**	-	-
DC-07	YVD-060522-08	6/5/2022	N	K2206116	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**28.5**	-	-
DC-09	DC-09-130103	01/03/2013	N	EPA01	-	-	-	-	-	-	-	-	-	0.1	U	-	-	-	-	-	-	-	-	-	-	-	-	-	**6**	-	-

Table 8
Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3-G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-09	DC-09-130923	09/23/2013	N	SWI0178	**44.7**	-	-	**45**	-	-	-	-	-	0.1	U	-	**34.0**	-	-	-	-	-	-	-	-	**8.4**	-	-	-	-	-
DC-09	DC-09-130926	09/26/2013	N	SWI0190	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**16.2**	-	-	0.5	U	-	-	-	-	**6.02**	-	-
DC-09	DC-09-131211	12/11/2013	N	SWL0063	**129**	-	-	**130**	-	-	-	-	-	-	R	MSD	**34.8**	-	-	**17.4**	-	-	0.5	U	-	**7.9**	-	-	**6.78**	-	-
DC-09	DC-09-140317	03/17/2014	N	SXC0095	**144**	-	-	**145**	-	-	-	-	-	0.1	U	-	**35.4**	-	-	**15.6**	-	-	**0.82**	-	-	**8.4**	-	-	**5.85**	-	-
DC-09	DC-09-140602	06/02/2014	N	SXF0008	**129**	-	-	**130**	-	-	-	-	-	**0.106**	-	-	**33.9**	-	-	**15.9**	-	-	0.5	U	-	**8.3**	-	-	**6.18**	-	-
DC-09	YVD-D3-140602	06/02/2014	FD	SXF0008	**129**	-	-	**130**	-	-	-	-	-	0.1	U	-	**34.2**	-	-	**15.8**	-	-	0.5	U	-	**8.7**	-	-	**5.97**	-	-
DC-09	DC-09-140923	09/23/2014	N	SXI0158	**124**	-	-	**125**	-	-	-	-	-	-	R	MSD	**32.2**	-	-	**15.8**	-	-	0.5	U	-	**6.8**	-	-	**6.01**	-	-
DC-09	DC-09-141216	12/16/2014	N	SXL0108	**129**	-	-	**130**	-	-	-	-	-	0.1	U	-	**35.3**	-	-	**16.3**	-	-	0.5	U	-	**8.0**	-	-	**5.94**	-	-
DC-09	DC-09-150316	03/16/2015	N	5904541	**130**	-	-	**130**	-	-	-	-	-	**0.15**	-	-	**36.0**	-	-	**17**	-	-	**0.6**	-	-	**8.0**	-	-	**5.9**	J-	MSD
DC-09	DC-09-150616	06/16/2015	N	59010751	**130**	-	-	**130**	-	-	-	-	-	0.1	U	-	**34.0**	J+	MSD	**16**	-	-	0.5	U	-	**8.1**	J+	MSD	**5.8**	-	-
DC-09	DC-09-150923	09/23/2015	N	59020281	**140**	-	-	**140**	-	-	-	-	-	0.1	U	-	**33.0**	-	-	**16**	-	-	0.5	U	-	**8.1**	-	-	**5.8**	-	-
DC-09	DC-09-151214	12/14/2015	N	59025431	**150**	J	FDP	**150**	J	FDP	-	-	-	-	R	MSD	**34.0**	-	-	**16**	-	-	0.5	U	-	**8.2**	-	-	**5.9**	-	-
DC-09	DC-09-160308	03/08/2016	N	59029711	**130**	-	-	**130**	-	-	-	-	-	-	R	FBK, FDP	**35.0**	-	-	**16**	-	-	0.5	U	-	**8.8**	-	-	**5.7**	-	-
DC-09	YVD-D2-160308	03/08/2016	FD	59029711	**130**	-	-	**130**	-	-	-	-	-	0.1	UJ	FDP	**34.0**	-	-	**16**	-	-	0.5	U	-	**8.6**	-	-	**5.7**	-	-
DC-09	DC-09-160621	6/21/2016	N	59037151	**130**	-	-	**130**	-	-	-	-	-	0.1	UJ	-	**32.0**	-	-	**17**	-	-	**0.51**	-	-	**7.5**	-	-	**5.9**	-	-
DC-09	DC-09-160929	9/29/2016	N	K1611704	**129**	-	-	**129**	-	-	-	-	-	0.050	U	MBK	**30.6**	-	-	**14.8**	-	-	**0.38**	-	-	**6.25**	-	-	**5.53**	-	-
DC-09	DC-09-D4-160929	9/29/2016	FD	K1611704	**128**	-	-	**128**	-	-	-	-	-	0.050	U	MBK	**30.4**	-	-	**14.9**	-	-	**0.38**	-	-	**6.22**	-	-	**5.53**	-	-
DC-09	DC-09-161215	12/15/2016	N	K1615126	**127**	-	-	**127**	-	-	-	-	-	0.050	U	-	**33.0**	-	-	**15.0**	-	-	**0.41**	-	-	**6.65**	-	-	**5.62**	-	-
DC-09	YVD-D4-161215	12/15/2016	FD	K1615126	**127**	-	-	**127**	-	-	-	-	-	0.050	U	-	**32.8**	-	-	**15.0**	-	-	**0.42**	-	-	**6.62**	-	-	**5.61**	-	-
DC-09	YVD-031317-36	3/13/2017	N	K1702489	**124**	-	-	**124**	-	-	-	-	-	0.050	U	-	**33.8**	-	-	**14.6**	-	-	**0.44**	-	-	**6.75**	-	-	**5.54**	-	-
DC-09	YVD-060717-27	6/7/2017	N	K1705833	**126**	-	-	**126**	-	-	-	-	-	0.050	U	-	**33.3**	-	-	**14.7**	-	-	**0.40**	-	-	**6.88**	-	-	**5.55**	-	-
DC-09	YVD-092617-23	9/26/2017	N	K1710333	**132**	-	-	**132**	-	-	-	-	-	0.050	U	-	**32.9**	-	-	**14.7**	-	-	**0.40**	-	-	**6.71**	-	-	**5.47**	-	-
DC-09	YVD-120417-09	12/4/2017	N	K1713026	**129**	-	-	**129**	-	-	-	-	-	0.050	U	-	**33.0**	-	-	**15.1**	-	-	**0.43**	-	-	**6.50**	-	-	**5.80**	-	-
DC-09	YVD-060418-25	6/4/2018	N	874860	**127**	-	-	**127**	-	-	0.070	U	-	-	-	-	**33.4**	-	-	**14.1**	-	-	**0.39**	-	-	**7.30**	-	-	**5.29**	-	-
DC-09	YVD-060319-19	6/3/2019	N	992053	**128**	-	-	**128**	-	-	0.070	U	-	-	-	-	**34.5**	-	-	**13.1**	-	-	**0.39**	-	-	**7.25**	-	-	**5.23**	-	-
DC-09	YVD-060920-25	6/9/2020	N	009269	**128**	-	-	**128**	-	-	0.070	U	-	-	-	-	**34.0**	-	-	**14.4**	-	-	**0.35**	-	-	**7.150**	-	-	**5.6**	-	-
DC-09	YVD-060721-15	6/7/2021	N	124105	**129**	-	-	**129**	-	-	0.070	U	-	-	-	-	**34.4**	-	-	**14.8**	-	-	**0.38**	-	-	**7.350**	-	-	**6.2**	-	-
DC-09	YVD-060722-29	6/7/2022	N	K2206237	**-**	-	-	**-**	-	-	-	-	-	-	-	-	**-**	-	-	**-**	-	-	**-**	-	-	**-**	-	-	**6.76**	J	HTQ
DC-14	DC-14-130103	01/03/2013	N	EPA01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**26**	-	-
DC-14	DC-14-130917	09/17/2013	N	SWI0113	**454**	-	-	**455**	-	-	-	-	-	**0.115**	-	-	**121**	-	-	**80.2**	-	-	0.5	U	-	**32.3**	-	-	**12**	-	-
DC-14	DC-14-131211	12/11/2013	N	SWL0063	**434**	-	-	**435**	-	-	-	-	-	-	R	MSD	**91.2**	-	-	**64.4**	-	-	5	U	-	**23.9**	-	-	**5.8**	-	-
DC-14	DC-14-140318	03/18/2014	N	SXC0095	**494**	-	-	**495**	-	-	-	-	-	0.1	U	-	**107**	-	-	**71.8**	-	-	5	U	-	**28.4**	-	-	**10.6**	-	-
DC-14	DC-14-140602	06/02/2014	N	SXF0017	**425**	-	-	**425**	-	-	-	-	-	0.1	U	-	**95.9**	-	-	**56.1**	-	-	1	U	-	**26.3**	-	-	**6.46**	-	-
DC-14	DC-14-140923	09/23/2014	N	SXI0158	**424**	-	-	**425**	-	-	-	-	-	-	R	MSD	**106**	-	-	**63.7**	-	-	1	U	-	**27.6**	-	-	**8.9**	-	-
DC-14	DC-14-141216	12/16/2014	N	SXL0108	**429**	-	-	**430**	-	-	-	-	-	0.1	U	-	**110**	-	-	**74.4**	-	-	1	U	-	**31.5**	-	-	**10.4**	-	-
DC-14	DC-14-150316	03/16/2015	N	5904541	**490**	-	-	**490**	-	-	-	-	-	**0.16**	-	-	**140**	-	-	**80**	-	-	1	U	-	**38.0**	-	-	**18**	J-	MSD
DC-14	DC-14-150616	06/16/2015	N	59010961	**430**	-	-	**430**	-	-	-	-	-	0.1	U	-	**120**	-	-	**76**	-	-	1	U	-	**33.0**	-	-	**12**	-	-
DC-14	DC-14-150924	09/24/2015	N	59020391	**470**	-	-	**470**	-	-	-	-	-	0.1	UJ	MSD	**130**	-	-	**96**	-	-	1	U	-	**42.0**	-	-	**22**	J+	MSD
DC-14	DC-14-151214	12/14/2015	N	59025351	**550**	-	-	**550**	-	-	-	-	-	-	R	MSD	**150**	-	-	**90**	-	-	1	U	-	**43.0**	-	-	**21**	-	-
DC-14	YVD-D1-151214	12/14/2015	FD	59025351	**540**	-	-	**540**	-	-	-	-	-	-	R	MSD	**150**	-	-	**85**	-	-	0.5	U	-	**43.0**	-	-	**22**	-	-
DC-14	DC-14-160309	03/09/2016	N	59029711	**490**	-	-	**490**	-	-	-	-	-	0.1	UJ	FDP	**130**	-	-	**82**	-	-	1	U	-	**38.0**	-	-	**16**	-	-
DC-14	DC-14-160620	6/20/2016	N	59037151	**460**	-	-	**460**	-	-	-	-	-	0.1	U	-	**120**	-	-	**75**	-	-	1	U	-	**36.0**	-	-	**16**	-	-
DC-14	DC-14-160929	9/29/2016	N	K1611704	**394**	-	-	**394**	-	-	-	-	-	0.050	U	MBK	**97.2**	-	-	**56.4**	-	-	**0.30**	-	-	**28.9**	-	-	**7.19**	-	-
DC-14	DC-14-161216	12/16/2016	N	K1615174	**361**	-	-	**361**	-	-	-	-	-	0.050	U	-	**93.3**	-	-	**53.9**	-	-	**0.36**	-	-	**22.3**	-	-	**4.45**	-	-
DC-14	YVD-031317-38	3/14/2017	N	K1702542	**359**	-	-	**359**	-	-	-	-	-	0.050	U	-	**91.0**	-	-	**49.6**	-	-	**0.34**	-	-	**24.4**	-	-	**4.34**	-	-
DC-14	YVD-060617-19	6/6/2017	N	K1705754	**386**	-	-	**386**	-	-	-	-	-	0.050	U	-	**97.7**	-	-	**49.2**	-	-	**0.34**	-	-	**24.4**	-	-	**3.86**	-	-
DC-14	YVD-092517-11	9/25/2017	N	K1710274	**382**	-	-	**382**	-	-	-	-	-	0.050	U	-	**98.2**	-	-	**43.3**	-	-	**0.34**	-	-	**24.5**	-	-	**2.41**	-	-

Table 8
Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3-G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-14	YVD-120617-27	12/6/2017	N	K1713157	**378**	-	-	**378**	-	-	-	-	-	0.050	U	MBK	**100**	-	-	**46.4**	-	-	**0.35**	-	-	**23.5**	-	-	**2.52**	-	-
DC-14	YVD-120617-29	12/6/2017	FD	K1713157	**372**	-	-	**372**	-	-	-	-	-	0.050	U	-	**97.7**	-	-	**46.0**	-	-	**0.34**	-	-	**22.8**	-	-	**2.52**	-	-
DC-14	YVD-031918-20	3/19/2018	N	870634	**372**	-	-	**372**	-	-	0.070	U	-	-	-	-	**95.0**	-	-	**47.9**	-	-	**0.31**	-	-	**22.55**	-	-	**2.86**	-	-
DC-14	YVD-060518-28	6/5/2018	N	874860	**370**	-	-	**370**	-	-	0.070	U	-	-	-	-	**92.0**	-	-	**56.5**	-	-	**0.31**	-	-	**23.45**	-	-	**4.00**	-	-
DC-14	YVD-060518-30	6/5/2018	FD	874860	-	R	PRS	-	R	PRS	0.070	U	-	-	-	-	**97.5**	-	-	-	R	PRS	-	R	PRS	**24.55**	-	-	-	R	PRS
DC-14	YVD-090918-08	9/9/2018	N	880601	**368**	-	-	**368**	-	-	0.070	U	-	-	-	-	**104**	-	-	**63.5**	-	-	**0.29**	-	-	**25.00**	-	-	**4.08**	-	-
DC-14	YVD-090918-10	9/9/2018	FD	880601	**363**	-	-	**363**	-	-	0.070	U	-	-	-	-	**105**	-	-	**70.8**	-	-	**0.29**	-	-	**25.05**	-	-	**4.00**	-	-
DC-14	YVD-121018-07	12/10/2018	N	884857	**376**	-	-	**376**	-	-	0.070	U	-	-	-	-	**105**	-	-	**72.8**	-	-	0.28	U	FBK	**25.70**	J	MSD	**4.60**	-	-
DC-14	YVD-031719-09	3/17/2019	N	988239	**395**	-	-	**395**	-	-	0.070	U	-	-	-	-	**118**	-	-	**83.8**	-	-	0.25	U	FBK	**27.80**	-	-	**5.00**	-	-
DC-14	YVD-060319-17	6/3/2019	N	992053	**395**	-	-	**395**	-	-	0.070	U	-	-	-	-	**122**	-	-	**79.7**	-	-	**0.22**	-	-	**29.65**	-	-	**5.35**	-	-
DC-14	YVD-091019-18	9/10/2019	N	998438	**427**	-	-	**427**	-	-	0.070	U	-	-	-	-	**132**	-	-	**89.5**	-	-	**0.24**	-	-	**32.25**	-	-	**7.70**	-	-
DC-14	YVD-120919-14	12/9/2019	N	902276	**438**	-	-	**438**	-	-	0.070	U	-	-	-	-	**134**	-	-	**95.2**	-	-	**0.32**	-	-	**32.85**	-	-	**8.00**	-	-
DC-14	YVD-033120-19	3/31/2020	N	006260	**451**	-	-	**451**	-	-	0.070	U	-	-	-	-	**134**	-	-	**87.6**	-	-	**0.24**	-	-	**32.50**	-	-	**9.5**	-	-
DC-14	YVD-033120-21	3/31/2020	FD	006260	**448**	-	-	**448**	-	-	0.070	U	-	-	-	-	**136**	-	-	**87.7**	-	-	**0.26**	-	-	**33.05**	-	-	**9.6**	-	-
DC-14	YVD-061020-32	6/10/2020	N	009361	**437**	-	-	**437**	-	-	0.070	U	-	-	-	-	**138**	-	-	**84.9**	-	-	**0.23**	-	-	**33.70**	J	MS	**11.5**	-	-
DC-14	YVD-061020-33	6/10/2020	FD	009361	**461**	-	-	**461**	-	-	0.070	U	-	-	-	-	**139**	-	-	**87.3**	-	-	**0.22**	-	-	**33.25**	J	MS	**12**	-	-
DC-14	YVD-092120-23	9/21/2020	N	013896	**472**	-	-	**472**	-	-	0.070	U	-	-	-	-	**150**	-	-	**90.5**	-	-	**0.21**	-	-	**36.10**	-	-	**17.3**	-	-
DC-14	YVD-120820-21	12/8/2020	N	017137	**496**	-	-	**496**	-	-	0.070	U	-	-	-	-	**174**	-	-	**89.4**	-	-	**0.18**	-	-	**41.50**	-	-	**23.6**	-	-
DC-14	YVD-030121-09	3/1/2021	N	119931	**517**	-	-	**517**	-	-	0.070	U	-	-	-	-	**186**	-	-	**90.9**	-	-	**0.24**	-	-	**44.30**	-	-	**31.2**	-	-
DC-14	YVD-060821-33	6/8/2021	N	124212	**563**	-	-	**563**	-	-	0.070	U	-	-	-	-	**196**	-	-	**93.4**	-	-	**0.14**	-	-	**47.05**	-	-	**40.2**	-	-
DC-14	YVD-121521-19	12/15/2021	N	K2114550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**51.4**	J	HTQ, MS
DC-14	YVD-031522-16	3/15/2022	N	K2202727	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**48.8**	-	-
DC-14	YVD-060722-28	6/7/2022	N	K2206237	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**57.4**	J	HTQ
YVD-02	YVD-02-130924	09/24/2013	N	SWI0178	**54.9**	-	-	**55**	-	-	-	-	-	**0.146**	-	-	**20.4**	-	-	**3.85**	-	-	0.5	U	-	**5.9**	-	-	**0.41**	-	-
YVD-02	YVD-02-140316	03/16/2014	N	SXC0081	**199**	-	-	**200**	-	-	-	-	-	0.1	U	-	**90.8**	-	-	**3.93**	-	-	**1.02**	-	-	**71.7**	-	-	0.2	U	-
YVD-02	YVD-02-140602	06/02/2014	N	SXF0008	**82.2**	-	-	**82.5**	-	-	-	-	-	0.1	U	-	**62.7**	-	-	**2.75**	-	-	0.5	U	-	**48.7**	-	-	0.2	U	-
YVD-02	YVD-02-140921	09/21/2014	N	SXI0148	**89.4**	-	-	**90**	-	-	-	-	-	0.1	U	-	**29.6**	-	-	**2.64**	-	-	0.5	U	-	**13.7**	J	FDP	0.2	U	-
YVD-02	YVD-D1-140921	09/21/2014	FD	SXI0148	**89.4**	-	-	**90**	-	-	-	-	-	0.1	U	-	**35.8**	-	-	**2.2**	-	-	0.5	U	-	**18.2**	J	FDP	0.2	U	-
YVD-02	YVD-02-141215	12/15/2014	N	SXL0103	**94.7**	-	-	**95**	-	-	-	-	-	0.1	U	-	**35.7**	-	-	**2.9**	J+	MSD	0.5	U	-	**17.4**	-	-	**0.22**	J	DUP
YVD-02	YVD-02-150615	06/15/2015	N	59010751	**75**	J+	FBK	**75**	J+	FBK	-	-	-	**0.11**	-	-	**32.0**	J+	MSD	**2.6**	-	-	0.5	U	-	**16.0**	J+	MSD	**0.23**	-	-
YVD-02	YVD-02-150923	09/23/2015	N	59020281	**95**	-	-	**95**	-	-	-	-	-	0.1	U	-	**28.0**	-	-	**2.5**	-	-	0.5	U	-	**17.0**	-	-	0.2	U	-
YVD-02	YVD-02-151214	12/14/2015	N	59025351	**100**	-	-	**100**	-	-	-	-	-	-	R	MSD	**38.0**	-	-	**2.6**	-	-	0.5	U	-	**23.0**	-	-	0.2	U	-
YVD-02	YVD-02-160308	03/08/2016	N	59029521	**110**	J	FDP	**110**	J	FDP	-	-	-	0.1	UJ	RPD	**32.0**	-	-	**3**	-	-	**0.57**	-	-	**20.0**	-	-	0.2	U	-
YVD-02	YVD-02-160620	6/20/2016	N	59037101	**75**	-	-	**75**	-	-	-	-	-	0.1	U	-	**25.0**	-	-	**2.9**	-	-	0.5	U	-	**10.0**	-	-	**0.31**	-	-
YVD-02	YVD-02-160928	9/28/2016	N	K1611629	**72**	-	-	**72**	-	-	-	-	-	0.050	U	MBK	**17.2**	-	-	**2.79**	J	DUP	**0.16**	J	-	**4.6**	-	-	**0.13**	-	-
YVD-02	YVD-030817-15	3/8/2017	N	K1702324	**103**	-	-	**103**	-	-	-	-	-	1	U	-	**30.2**	-	-	**3.85**	-	-	**0.21**	-	-	**7.2**	-	-	**5.40**	-	-
YVD-02	YVD-060617-14	6/6/2017	N	K1705754	**81**	-	-	**81**	-	-	-	-	-	0.050	U	-	**20.9**	-	-	**3.03**	-	-	**0.16**	J	-	**4.85**	-	-	**0.20**	-	-
YVD-02	YVD-060617-16	6/6/2017	FD	K1705754	**67**	-	-	**67**	-	-	-	-	-	0.050	U	-	**20.2**	-	-	**2.95**	-	-	**0.15**	J	-	**4.74**	-	-	**0.20**	-	-
YVD-02	YVD-092617-20	9/26/2017	N	K1710333	**75**	-	-	**75**	-	-	-	-	-	0.050	U	-	**17.7**	-	-	**2.63**	-	-	**0.15**	J	-	**4.64**	-	-	**0.17**	-	-
YVD-02	YVD-120417-02	12/4/2017	N	K1713026	**89**	-	-	**89**	-	-	-	-	-	0.050	U	-	**20.0**	-	-	**2.37**	-	-	**0.29**	-	-	**7.43**	-	-	**0.22**	-	-
YVD-02	YVD-120417-04	12/4/2017	FD	K1713026	**93**	-	-	**93**	-	-	-	-	-	0.050	U	-	**19.6**	-	-	**2.20**	-	-	**0.31**	-	-	**7.74**	-	-	**0.20**	-	-
YVD-02	YVD-061218-32	6/12/2018	N	875438	-	R	NR	-	R	NR	-	R	NR	-	-	-	-	R	NR	-	R	NR	-	R	NR	-	R	NR	-	R	NR
YVD-02	YVD-060419-28	6/4/2019	N	992242	**191**	-	-	**191**	-	-	0.07	U	-	-	-	-	**54.0**	-	-	**12.5**	-	-	**0.18**	-	-	**19.55**	-	-	**33.9**	J	HTQ
YVD-02	YVD-070219-33	7/2/2019	N	994356	**204**	-	-	**204**	-	-	0.07	U	-	-	-	-	**87.0**	-	-	**13.0**	-	-	**0.19**	-	-	**32.35**	-	-	**36.1**	-	-
YVD-02	YVD-091019-19	9/10/2019	N	998438	**200**	-	-	**200**	-	-	0.07	U	-	-	-	-	**97.0**	-	-	**11.3**	-	-	**0.13**	-	-	**26.95**	-	-	**43.6**	-	-
YVD-02	YVD-121019-23	12/10/2019	N	902321	**226**	-	-	**226**	-	-	0.07	U	-				**85.0**	-	-	**11.6**	-	-	**0.33**	-	-	**31.60**	-	-	**38.9**	-	-
YVD-02	YVD-040120-23	4/1/2020	N	006311	**237**	-	-	**237**	-	-	0.07	U	-	-	-	-	**59.5**	-	-	**11.7**	-	-	**0.55**	-	-	**25.40**	-	-	**20.6**	-	-

Table 8
Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3-G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-02	YVD-061120-35	6/11/2020	N	009430	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**15.5**	-	-
YVD-02	NS[1]	9/21/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-02	NS[1]	12/8/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-02	NS[1]	3/1/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-02	NS[1]	6/8/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-02	NS[1]	12/15/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-02	NS[1]	3/15/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-02	NS[1]	6/7/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-03	YVD-03-130916	09/16/2013	N	SWI0113	**209**	-	-	**210**	-	-	-	-	-	0.1	U	-	**57.5**	-	-	**14**	-	-	**0.74**	-	-	**24.3**	-	-	**4.75**	-	-
YVD-03	YVD-03-131210	12/10/2013	N	SWL0063	**214**	-	-	**215**	-	-	-	-	-	-	R	MSD	**48.7**	-	-	**14.3**	-	-	1	U	-	**20.4**	-	-	**5.96**	-	-
YVD-03	YVD-03-140317	03/17/2014	N	SXC0081	**219**	-	-	**220**	-	-	-	-	-	**0.249**	-	-	**51.2**	-	-	**13.3**	-	-	**1.03**	-	-	**18.2**	-	-	**4.75**	-	-
YVD-03	YVD-03-140602	06/02/2014	N	SXF0008	**206**	-	-	**208**	-	-	-	-	-	0.1	U	-	**46.4**	-	-	**10.7**	-	-	0.5	U	-	**16.8**	-	-	**3.86**	-	-
YVD-03	YVD-03-140923	09/23/2014	N	SXI0158	**199**	-	-	**200**	-	-	-	-	-	-	R	MSD	**52.2**	-	-	**11.8**	-	-	**0.62**	-	-	**19.5**	-	-	**3.97**	-	-
YVD-03	YVD-D3-140923	09/23/2014	FD	SXI0158	**199**	-	-	**200**	-	-	-	-	-	-	R	MSD	**45.4**	-	-	**12.1**	-	-	**0.65**	-	-	**16.2**	-	-	**4.04**	-	-
YVD-03	YVD-03-141215	12/15/2014	N	SXL0108	**199**	-	-	**200**	-	-	-	-	-	0.1	U	-	**51.7**	-	-	**12.9**	-	-	**0.54**	-	-	**19.3**	-	-	**4.27**	-	-
YVD-03	YVD-03-150316	03/16/2015	N	5904541	**210**	-	-	**210**	-	-	-	-	-	0.1	U	-	**46.0**	-	-	**13**	-	-	**0.84**	-	-	**17.0**	-	-	**4.1**	J-	MSD
YVD-03	YVD-03-150616	06/16/2015	N	59010751	**200**	-	-	**200**	-	-	-	-	-	**0.12**	-	-	**50.0**	J+	MSD	**12**	-	-	**0.68**	-	-	**20.0**	J+	MSD	**4**	-	-
YVD-03	YVD-03-150922	09/22/2015	N	59020141	**220**	-	-	**220**	-	-	-	-	-	0.1	U	-	**43.0**	-	-	**14**	-	-	**0.66**	-	-	**19.0**	-	-	**4.9**	-	-
YVD-03	YVD-03-151214	12/14/2015	N	59025351	**230**	-	-	**230**	-	-	-	-	-	-	R	MSD	**49.0**	-	-	**14**	-	-	**0.74**	-	-	**22.0**	-	-	**4.9**	-	-
YVD-03	YVD-03-160307	03/07/2016	N	59029521	**150**	J	FDP	**150**	J	FDP	-	-	-	0.1	UJ	RPD	**43.0**	-	-	**13**	-	-	**0.72**	-	-	**20.0**	-	-	**4.6**	-	-
YVD-03	YVD-03-160620	6/20/2016	N	59037151	**190**	-	-	**190**	-	-	-	-	-	0.1	U	-	**46.0**	-	-	**14**	-	-	**0.76**	-	-	**21.0**	-	-	**4.6**	-	-
YVD-03	YVD-03-160929	9/29/2016	N	K1611758	**196**	-	-	**196**	-	-	-	-	-	0.050	U	MBK	**43.2**	-	-	**11.7**	-	-	**0.61**	-	-	**18.3**	-	-	**4.39**	-	-
YVD-03	YVD-03-161213	12/13/2016	N	K1615045	**189**	-	-	**189**	-	-	-	-	-	0.050	U	-	**40.0**	-	-	**11.6**	-	-	**0.69**	-	-	**17.4**	-	-	**4.47**	-	-
YVD-03	YVD-030617-02	3/6/2017	N	K1702228	**190**	-	-	**190**	-	-	-	-	-	0.050	U	-	**41.6**	-	-	**11.4**	-	-	**0.60**	-	-	**17.3**	-	-	**4.42**	-	-
YVD-03	YVD-030617-03	3/6/2017	FD	K1702228	**192**	-	-	**192**	-	-	-	-	-	0.050	U	-	**41.5**	-	-	**11.6**	-	-	**0.65**	-	-	**17.3**	-	-	**4.48**	-	-
YVD-03	YVD-060517-13	6/5/2017	N	K1705702	**189**	-	-	**189**	-	-	-	-	-	0.050	U	-	**41.9**	-	-	**11.9**	-	-	**0.66**	-	-	**18.1**	-	-	**4.61**	-	-
YVD-03	YVD-092517-05	9/25/2017	N	K1710274	**193**	-	-	**193**	-	-	-	-	-	0.050	U	-	**41.6**	-	-	**11.6**	-	-	**0.66**	-	-	**18.7**	-	-	**4.45**	-	-
YVD-03	YVD-120517-19	12/5/2017	N	K1713091	**181**	-	-	**181**	-	-	-	-	-	0.050	U	-	**41.9**	-	-	**11.1**	-	-	**0.64**	-	-	**17.4**	-	-	**4.52**	-	-
YVD-03	YVD-060518-27	6/5/2018	N	874860	**188**	-	-	**188**	-	-	0.070	U	-	-	-	-	**39.0**	-	-	**11.3**	-	-	**0.62**	-	-	**17.4**	-	-	**4.70**	-	-
YVD-03	YVD-060219-07	6/2/2019	N	991939	**185**	-	-	**185**	-	-	0.070	U	-	-	-	-	**40.3**	-	-	8.19	U	FBK	0.44	U	FBK	**17.2**	-	-	**3.16**	-	-
YVD-03	YVD-060820-09	6/8/2020	N	009144	**184**	-	-	**184**	-	-	0.070	U	-	-	-	-	**40.5**	-	-	**11.6**	-	-	**0.56**	-	-	**17.55**	-	-	**5.2**	-	-
YVD-03	YVD-060821-24	6/8/2021	N	124212	**182**	-	-	**182**	-	-	0.070	U	-	-	-	-	**42.2**	-	-	**8.09**	-	-	**0.37**	-	-	**17.75**	-	-	**3.23**	-	-
YVD-03	YVD-060822-31	6/8/2022	N	K2206299	**-**	-	-	**-**	-	-	-	-	-	-	-	-	**-**	-	-	**-**	-	-	**-**	-	-	**-**	-	-	**5.08**	-	-
YVD-03	YVD-060822-32	6/8/2022	FD	K2206299	**-**	-	-	**-**	-	-	-	-	-	-	-	-	**-**	-	-	**-**	-	-	**-**	-	-	**-**	-	-	**5.10**	-	-
YVD-04	YVD-04-130916	09/16/2013	N	SWI0113	**184**	-	-	**185**	-	-	-	-	-	0.1	U	-	**37.4**	-	-	**14.9**	-	-	0.5	U	-	**11.2**	-	-	**4.45**	-	-
YVD-04	YVD-04-131210	12/10/2013	N	SWL0063	**203**	-	-	**205**	-	-	-	-	-	-	R	MSD	**38.2**	-	-	**15**	-	-	1	U	-	**11.7**	-	-	**4.64**	-	-
YVD-04	YVD-04-140317	03/17/2014	N	SXC0081	**209**	-	-	**210**	-	-	-	-	-	0.1	U	-	**37.7**	-	-	**15.1**	-	-	**0.63**	-	-	**11.6**	-	-	**4.03**	-	-
YVD-04	YVD-04-140602	06/02/2014	N	SXF0008	**191**	-	-	**193**	-	-	-	-	-	**0.113**	-	-	**36.8**	-	-	**14.3**	-	-	1	U	-	**11.5**	-	-	**3.78**	-	-
YVD-04	YVD-04-140923	09/23/2014	N	SXI0158	**188**	-	-	**190**	-	-	-	-	-	-	R	MSD	**37.8**	-	-	**15.3**	-	-	0.5	U	-	**11.5**	-	-	**3.87**	-	-
YVD-04	YVD-04-141215	12/15/2014	N	SXL0108	**188**	-	-	**190**	-	-	-	-	-	0.1	U	-	**38.8**	-	-	**15.2**	-	-	0.5	U	-	**12.4**	-	-	**3.81**	-	-
YVD-04	YVD-04-150315	03/15/2015	N	5904471	**190**	-	-	**190**	-	-	-	-	-	0.1	U	-	**38.0**	-	-	**16**	-	-	0.5	U	-	**12.0**	-	-	**4.3**	-	-
YVD-04	YVD-04-150615	06/15/2015	N	59010751	**190**	-	-	**190**	-	-	-	-	-	0.1	U	-	**38.0**	J+	MSD	**15**	-	-	0.5	U	-	**8.5**	J+	MSD	**4**	-	-
YVD-04	YVD-04-150922	09/22/2015	N	59020141	**200**	-	-	**200**	-	-	-	-	-	**0.13**	-	-	**36.0**	-	-	**15**	-	-	0.5	U	-	**11.0**	-	-	**3.9**	-	-
YVD-04	YVD-04-151213	12/13/2015	N	59025351	**200**	-	-	**200**	-	-	-	-	-	-	R	MSD	**39.0**	-	-	**15**	-	-	0.5	U	-	**12.0**	-	-	**4.1**	-	-
YVD-04	YVD-04-160307	03/07/2016	N	59029521	**250**	J	FDP	**250**	J	FDP	-	-	-	0.1	UJ	RPD	**36.0**	-	-	**14**	-	-	0.5	U	-	**12.0**	-	-	**3.7**	-	-
YVD-04	YVD-04-160620	6/20/2016	N	59037101	**190**	-	-	**190**	-	-	-	-	-	0.1	U	-	**36.0**	-	-	**15**	-	-	0.5	U	-	**12.0**	-	-	**4**	-	-
YVD-04	YVD-D1-160620	6/20/2016	FD	59037101	**180**	-	-	**180**	-	-	-	-	-	0.1	U	-	**35.0**	-	-	**15**	-	-	0.5	U	-	**12.0**	-	-	**4**	-	-

Table 8
Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3-G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-04	YVD-04-160928	9/28/2016	N	K1611629	**187**	-	-	**187**	-	-	-	-	-	0.050	U	-	**34.7**	-	-	**13.2**	-	-	**0.21**	-	-	**10.7**	-	-	**3.67**	-	-
YVD-04	YVD-04-D3-160928	9/28/2016	FD	K1611629	**185**	-	-	**185**	-	-	-	-	-	0.050	U	MBK	**34.7**	-	-	**13.2**	-	-	**0.20**	-	-	**10.9**	-	-	**3.68**	-	-
YVD-04	YVD-04-161213	12/13/2016	N	K1615045	**181**	-	-	**181**	-	-	-	-	-	0.050	U	-	**35.2**	-	-	**13.2**	-	-	**0.23**	-	-	**10.9**	-	-	**3.74**	-	-
YVD-04	YVD-031017-28	3/10/2017	N	K1702448	**167**	-	-	**167**	-	-	-	-	-	0.050	U	-	**37.8**	-	-	**13.2**	-	-	**0.21**	-	-	**10.9**	-	-	**3.70**	-	-
YVD-04	YVD-060517-11	6/5/2017	N	K1705702	**182**	-	-	**182**	-	-	-	-	-	0.050	U	-	**36.5**	-	-	**13.0**	-	-	**0.22**	-	-	**9.85**	-	-	**3.53**	-	-
YVD-04	YVD-092517-07	9/25/2017	N	K1710274	**188**	-	-	**188**	-	-	-	-	-	0.050	U	-	**37.2**	-	-	**12.9**	-	-	**0.21**	-	-	**11.7**	-	-	**3.57**	-	-
YVD-04	YVD-120417-13	12/4/2017	N	K1713091	**185**	-	-	**185**	-	-	-	-	-	0.050	U	-	**36.5**	-	-	**13.2**	-	-	**0.24**	-	-	**10.9**	-	-	**3.79**	-	-
YVD-04	YVD-060418-21	6/4/2018	N	874662	**179**	-	-	**179**	-	-	0.08	U	FBK	-	-	-	**37.0**	-	-	**12.3**	-	-	**0.19**	-	-	**11.65**	-	-	**4.10**	-	-
YVD-04	YVD-060219-05	6/2/2019	N	991939	**181**	-	-	**181**	-	-	0.070	U	-	-	-	-	**36.2**	-	-	22.9	U	FBK	0.79	U	FBK	**11.10**	-	-	**3.85**	-	-
YVD-04	YVD-060820-05	6/8/2020	N	009144	**182**	-	-	**182**	-	-	0.070	U	-	-	-	-	**34.9**	-	-	**12.7**	-	-	**0.16**	-	-	**10.90**	-	-	**4.1**	-	-
YVD-04	YVD-060821-22	6/8/2021	N	124212	**182**	-	-	**182**	-	-	0.070	U	-	-	-	-	**35.4**	-	-	**12.5**	-	-	**0.16**	-	-	**10.65**	-	-	**3.73**	-	-
YVD-04	YVD-060622-17	6/6/2022	N	K2206160	**-**	-	-	**-**	-	-	-	-	-	-	-	-	**-**	-	-	**-**	-	-	**-**	-	-	**-**	-	-	**4.70**	-	-
YVD-05	YVD-05-130917	09/17/2013	N	SWI0113	**184**	-	-	**185**	-	-	-	-	-	**0.112**	-	-	**66.0**	-	-	**10.2**	-	-	0.5	U	-	**31.0**	-	-	**4.9**	-	-
YVD-05	YVD-05-131211	12/11/2013	N	SWL0063	**174**	-	-	**175**	-	-	-	-	-	-	R	MSD	**41.5**	-	-	**10**	-	-	1	U	-	**17.0**	-	-	**4.36**	-	-
YVD-05	YVD-05-140317	03/17/2014	N	SXC0081	**174**	-	-	**175**	-	-	-	-	-	0.1	U	-	**33.7**	-	-	**8.4**	-	-	**1.3**	-	-	**13.5**	-	-	**3.3**	-	-
YVD-05	YVD-05-140601	06/01/2014	N	SXF0008	**164**	-	-	**165**	-	-	-	-	-	0.1	U	-	**30.8**	-	-	**8.4**	-	-	1	U	-	**13.2**	-	-	**3**	-	-
YVD-05	YVD-05-140922	09/22/2014	N	SXI0148	**159**	-	-	**160**	-	-	-	-	-	0.1	U	-	**31.6**	-	-	**7.6**	-	-	1	U	-	**13.7**	-	-	**2.82**	-	-
YVD-05	YVD-05-141215	12/15/2014	N	SXL0103	**154**	-	-	**155**	-	-	-	-	-	0.1	U	-	**36.9**	-	-	**4.56**	J+	MSD, FDP	1	U	-	**17.0**	-	-	**1.5**	J	FDP, DUP
YVD-05	YVD-D1-141215	12/15/2014	FD	SXL0103	**153**	-	-	**155**	-	-	-	-	-	0.1	U	-	**34.2**	-	-	**7.8**	J+	MSD, FDP	0.5	U	-	**15.0**	-	-	**2.65**	J	FDP, DUP
YVD-05	YVD-05-150316	03/16/2015	N	5904471	**160**	-	-	**160**	-	-	-	-	-	0.1	U	-	**33.0**	-	-	**8**	-	-	1	U	-	**15.0**	-	-	**2.8**	-	-
YVD-05	YVD-05-150616	06/16/2015	N	59010751	**170**	-	-	**170**	-	-	-	-	-	0.1	U	-	**35.0**	J+	MSD	**8.9**	-	-	1	U	-	**16.0**	J+	MSD	**3.1**	-	-
YVD-05	YVD-05-150922	09/22/2015	N	59020281	**160**	-	-	**160**	-	-	-	-	-	0.1	U	-	**42.0**	-	-	**8.8**	-	-	1	U	-	**20.0**	-	-	**3**	-	-
YVD-05	YVD-05-151214	12/14/2015	N	59025351	**180**	-	-	**180**	-	-	-	-	-	-	R	MSD	**37.0**	-	-	**7.9**	-	-	1	U	-	**17.0**	-	-	**2.8**	-	-
YVD-05	YVD-05-160307	03/07/2016	N	59029521	**160**	J	FDP	**160**	J	FDP	-	-	-	0.1	UJ	RPD	**32.0**	-	-	**8.3**	-	-	1	U	-	**15.0**	-	-	**2.7**	-	-
YVD-05	YVD-D1-160307	03/07/2016	FD	59029521	**170**	J	FDP	**170**	J	FDP	-	-	-	0.1	UJ	RPD	**32.0**	-	-	**8.7**	-	-	**0.59**	-	-	**15.0**	-	-	**2.9**	-	-
YVD-05	YVD-05-160620	6/20/2016	N	59037151	**170**	-	-	**170**	-	-	-	-	-	0.1	U	-	**31.0**	-	-	**9.1**	-	-	1	U	-	**14.0**	-	-	**3**	-	-
YVD-05	YVD-05-160928	9/28/2016	N	K1611698	**171**	-	-	**171**	-	-	-	-	-	0.050	U	MBK	**32.1**	-	-	**8.37**	-	-	**0.44**	-	-	**13.8**	-	-	**3.12**	-	-
YVD-05	YVD-05-161215	12/15/2016	N	K1615174	**163**	-	-	**163**	-	-	-	-	-	0.050	U	-	**33.3**	-	-	**8.30**	-	-	**0.48**	-	-	**13.1**	-	-	**3.15**	-	-
YVD-05	YVD-031317-32	3/13/2017	N	K1702489	**166**	-	-	**166**	-	-	-	-	-	0.050	U	-	**31.4**	-	-	**7.89**	-	-	**0.49**	-	-	**14.1**	-	-	**2.88**	-	-
YVD-05	YVD-031317-34	3/13/2017	FD	K1702489	**168**	-	-	**168**	-	-	-	-	-	0.050	U	-	**31.4**	-	-	**7.92**	-	-	**0.48**	-	-	**14.0**	-	-	**2.91**	-	-
YVD-05	YVD-060617-23	6/6/2017	N	K1705754	**168**	-	-	**168**	-	-	-	-	-	0.050	U	-	**31.6**	-	-	**8.12**	-	-	**0.47**	-	-	**13.9**	-	-	**2.90**	-	-
YVD-05	YVD-092517-09	9/25/2017	N	K1710274	**173**	-	-	**173**	-	-	-	-	-	0.050	U	-	**35.3**	-	-	**8.01**	-	-	**0.47**	-	-	**14.6**	-	-	**2.82**	-	-
YVD-05	YVD-120517-15	12/5/2017	N	K1713091	**171**	-	-	**171**	-	-	-	-	-	0.050	U	MBK	**31.3**	-	-	**7.92**	-	-	**0.51**	-	-	**13.5**	-	-	**2.81**	-	-
YVD-05	YVD-060518-29	6/5/2018	N	874860	**170**	-	-	**170**	-	-	0.070	U	-	-	-	-	**31.6**	-	-	**8.29**	-	-	**0.44**	-	-	**14.15**	-	-	**2.79**	-	-
YVD-05	YVD-060219-09	6/2/2019	N	991939	**176**	-	-	**176**	-	-	0.070	U	-	-	-	-	**33.2**	-	-	6.43	U	FBK	0.31	U	FBK	**14.35**	-	-	**2.18**	-	-
YVD-05	YVD-060920-15	6/9/2020	N	009269	**182**	-	-	**182**	-	-	0.070	U	-	-	-	-	**35.4**	-	-	**9.24**	-	-	**0.39**	-	-	**15.40**	-	-	**3.88**	-	-
YVD-05	YVD-060821-26	6/8/2021	N	124212	**198**	-	-	**198**	-	-	0.070	U	-	-	-	-	**39.6**	-	-	**11.0**	-	-	**0.68**	-	-	**17.30**	-	-	**4.5**	-	-
YVD-05	YVD-060622-19	6/6/2022	N	K2206160	**-**	-	-	**-**	-	-	-	-	-	-	-	-	**-**	-	-	**-**	-	-	**-**	-	-	**-**	-	-	**5.60**	-	-
YVD-06	YVD-06-130917	09/17/2013	N	SWI0113	**149**	-	-	**150**	-	-	-	-	-	0.1	U	-	**46.0**	-	-	**3.13**	-	-	0.5	U	-	**12.8**	-	-	**0.51**	-	-
YVD-06	YVD-06-131209	12/09/2013	N	SWL0055	**154**	-	-	**155**	-	-	-	-	-	0.02	UJ	MSD	**31.2**	J	FDP	**2.73**	-	-	0.5	U	-	**5.3**	J	FDP	**0.49**	J	FDP
YVD-06	YVD-D1-131209	12/09/2013	FD	SWL0055	**159**	-	-	**160**	-	-	-	-	-	0.02	UJ	MSD	**38.9**	J	FDP	8	U	-	5	U	-	**6.6**	J	FDP	**6.4**	J	FDP

Table 8
Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3-G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-06	YVD-06-140316	03/16/2014	N	SXC0081	**174**	-	-	**175**	-	-	-	-	-	0.1	U	-	**40.1**	-	-	**3.47**	-	-	**0.58**	-	-	**7.6**	-	-	**0.61**	-	-
YVD-06	YVD-D1-140316	03/16/2014	FD	SXC0081	**159**	-	-	**160**	-	-	-	-	-	0.1	U	-	**40.5**	-	-	**3.16**	-	-	**0.55**	-	-	**7.8**	-	-	**0.62**	-	-
YVD-06	YVD-06-140601	06/01/2014	N	SXF0008	**156**	-	-	**158**	-	-	-	-	-	**0.172**	-	-	**37.8**	-	-	**2.88**	J	DUP	0.5	U	-	**6.5**	-	-	**0.51**	-	-
YVD-06	YVD-D1-140601	06/01/2014	FD	SXF0008	**153**	-	-	**155**	-	-	-	-	-	0.1	U	-	**38.3**	-	-	**2.95**	-	-	0.5	U	-	**6.6**	-	-	**0.56**	-	-
YVD-06	YVD-06-140921	09/21/2014	N	SXI0148	**149**	-	-	**150**	-	-	-	-	-	**0.139**	-	-	**41.3**	-	-	**2.45**	-	-	0.5	U	-	**8.5**	-	-	**0.44**	-	-
YVD-06	YVD-06-141215	12/15/2014	N	SXL0103	**149**	-	-	**150**	-	-	-	-	-	0.1	U	-	**40.3**	-	-	**2.5**	J+	MSD	0.5	U	-	**7.8**	-	-	**0.45**	J	DUP
YVD-06	YVD-06-150316	03/16/2015	N	5904471	**150**	-	-	**150**	-	-	-	-	-	0.1	U	-	**38.0**	-	-	**2.8**	-	-	0.5	U	-	**6.8**	-	-	**0.99**	-	-
YVD-06	YVD-06-150616	06/16/2015	N	59010751	**150**	-	-	**150**	-	-	-	-	-	0.1	U	-	**40.0**	J+	MSD	**2.7**	-	-	0.5	U	-	**7.0**	J+	MSD	**0.53**	-	-
YVD-06	YVD-06-150922	09/22/2015	N	59020141	**170**	-	-	**170**	-	-	-	-	-	**0.11**	-	-	**41.0**	-	-	**2.8**	-	-	0.5	U	-	**9.8**	-	-	**0.51**	-	-
YVD-06	YVD-06-151214	12/14/2015	N	59025351	**170**	-	-	**170**	-	-	-	-	-	-	R	MSD	**42.0**	-	-	**2.4**	-	-	0.5	U	-	**7.3**	-	-	**0.51**	-	-
YVD-06	YVD-06-160307	03/07/2016	N	59029521	**160**	J	FDP	**160**	J	FDP	-	-	-	0.1	UJ	RPD	**38.0**	-	-	**2.8**	-	-	0.5	U	-	**7.2**	-	-	**0.51**	-	-
YVD-06	YVD-06-160620	6/20/2016	N	59037151	**150**	-	-	**150**	-	-	-	-	-	0.1	U	-	**37.0**	-	-	**3.1**	-	-	0.5	U	-	**6.6**	-	-	**0.53**	-	-
YVD-06	YVD-06-160929	9/29/2016	N	K1611704	**145**	-	-	**145**	-	-	-	-	-	0.050	U	MBK	**35.7**	-	-	**2.64**	-	-	**0.20**	-	-	**6.1**	-	-	**0.55**	-	-
YVD-06	YVD-06-161215	12/15/2016	N	K1615126	**136**	-	-	**136**	-	-	-	-	-	0.050	U	-	**33.5**	-	-	**3.14**	-	-	**0.23**	-	-	**5.7**	-	-	**0.70**	-	-
YVD-06	YVD-030617-04	3/6/2017	N	K1702228	**142**	-	-	**142**	-	-	-	-	-	**0.021**	J	-	**35.2**	-	-	**2.83**	-	-	**0.29**	-	-	**5.8**	-	-	**0.61**	-	-
YVD-06	YVD-060617-21	6/6/2017	N	K1705754	**144**	-	-	**144**	-	-	-	-	-	0.050	U	-	**36.9**	-	-	**2.54**	-	-	**0.19**	J	-	**6.07**	-	-	**0.51**	-	-
YVD-06	YVD-092617-17	9/26/2017	N	K1710333	**140**	-	-	**140**	-	-	-	-	-	0.050	U	-	**35.0**	-	-	**2.94**	-	-	**0.23**	-	-	**5.82**	-	-	**0.62**	-	-
YVD-06	YVD-092617-18	9/26/2017	FD	K1710333	**140**	-	-	**140**	-	-	-	-	-	0.050	U	-	**34.6**	-	-	**2.95**	-	-	**0.22**	-	-	**5.77**	-	-	**0.62**	-	-
YVD-06	YVD-120517-17	12/5/2017	N	K1713091	**137**	-	-	**137**	-	-	-	-	-	0.050	U	MBK	**34.7**	-	-	**3.23**	-	-	**0.25**	-	-	**5.81**	-	-	**0.73**	-	-
YVD-06	YVD-060318-15	6/3/2018	N	874568	**138**	-	-	**138**	-	-	0.09	U	FBK	-	-	-	**37.5**	-	-	**2.69**	-	-	**0.18**	-	-	**6.45**	-	-	**0.56**	-	-
YVD-06	YVD-060219-11	6/2/2019	N	991939	**134**	-	-	**134**	-	-	0.070	U	-	-	-	-	**35.6**	-	-	2.50	U	FBK	0.15	U	FBK	**6.05**	-	-	**0.51**	-	-
YVD-06	YVD-060920-17	6/9/2020	N	009269	**132**	-	-	**132**	-	-	0.070	U	-	-	-	-	**34.2**	-	-	**3.20**	-	-	**0.17**	-	-	**5.900**	-	-	**0.7**	-	-
YVD-06	YVD-060721-19	6/7/2021	N	124105	**160**	-	-	**160**	-	-	0.070	U	-	-	-	-	**34.0**	-	-	**4.95**	-	-	**0.25**	-	-	**5.900**	-	-	**0.67**	-	-
YVD-06	YVD-060722-30	6/7/2022	N	K2206237	**-**	-	-	**-**	-	-	-	-	-	-	-	-	**-**	-	-	**-**	-	-	**-**	-	-	**-**	-	-	**0.67**	J	HTQ
YVD-07	YVD-07-130923	09/23/2013	N	SWI0178	**79.4**	-	-	**80**	-	-	-	-	-	0.1	U	-	**27.7**	-	-	-	-	-	-	-	-	**16.2**	-	-	-	-	-
YVD-07	YVD-07-130926	09/26/2013	N	SWI0190	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**7.53**	-	-	0.5	U	-	-	-	-	**4.4**	-	-
YVD-07	YVD-07-131210	12/10/2013	N	SWL0055	**135**	-	-	**135**	-	-	-	-	-	0.02	UJ	MSD	**99.2**	-	-	**8.46**	-	-	**0.55**	-	-	**16.0**	-	-	**5.3**	-	-
YVD-07	YVD-07-140316	03/16/2014	N	SXC0081	**134**	-	-	**135**	-	-	-	-	-	**0.116**	-	-	**33.4**	-	-	**11.6**	-	-	**0.83**	-	-	**14.1**	-	-	**3.9**	-	-
YVD-07	YVD-07-140604	06/04/2014	N	SXF0025	**137**	-	-	**138**	-	-	-	-	-	0.1	U	-	**38.4**	-	-	**9.74**	-	-	1	U	-	**18.3**	-	-	**3.36**	-	-
YVD-07	YVD-07-140922	09/22/2014	N	SXI0158	**134**	-	-	**135**	-	-	-	-	-	-	R	MSD	**31.4**	-	-	**10.3**	-	-	1	U	-	**12.7**	-	-	**5.52**	-	-
YVD-07	YVD-07-141216	12/16/2014	N	SXL0108	**133**	-	-	**135**	-	-	-	-	-	0.1	U	-	**29.9**	-	-	**8.76**	-	-	1	U	-	**12.2**	-	-	**2.92**	-	-
YVD-07	YVD-07-150316	03/16/2015	N	5904541	**140**	-	-	**140**	-	-	-	-	-	0.1	U	-	**37.0**	-	-	**15**	-	-	1	U	-	**15.0**	-	-	**4**	J-	MSD
YVD-07	YVD-D2-150316	03/16/2015	FD	5904541	**140**	-	-	**140**	-	-	-	-	-	0.1	U	-	**35.0**	-	-	**16**	-	-	**0.65**	-	-	**14.0**	-	-	**4.2**	J-	MSD
YVD-07	YVD-07-150616	06/16/2015	N	59010751	**150**	-	-	**150**	-	-	-	-	-	0.1	U	-	**34.0**	J+	MSD	**13**	-	-	0.5	U	-	**14.0**	J+	MSD	**3.3**	-	-
YVD-07	YVD-D1-150616	06/16/2015	FD	59010751	**140**	-	-	**140**	-	-	-	-	-	0.1	U	-	**35.0**	J+	MSD	**14**	-	-	0.5	U	-	**14.0**	J+	MSD	**3.5**	-	-
YVD-07	YVD-07-150923	09/23/2015	N	59020281	**160**	-	-	**160**	-	-	-	-	-	**0.22**	-	-	**33.0**	-	-	**9.9**	-	-	1	U	-	**14.0**	-	-	**4.7**	-	-
YVD-07	YVD-07-151214	12/14/2015	N	59025431	**140**	J	FDP	**140**	J	FDP	-	-	-	-	R	MSD	**30.0**	-	-	**6.7**	-	-	1	U	-	**13.0**	-	-	**2.4**	-	-
YVD-07	YVD-07-160308	03/08/2016	N	59029711	**140**	-	-	**140**	-	-	-	-	-	**1.1**	J+	FBK, FDP	**25.0**	-	-	**6.7**	-	-	1	U	-	**11.0**	-	-	**1.8**	-	-
YVD-07	YVD-07-160621	6/21/2016	N	59037151	**100**	-	-	**100**	-	-	-	-	-	0.1	U	-	**19.0**	-	-	**6.2**	-	-	1	U	-	**9.0**	-	-	**1.2**	-	-
YVD-07	YVD-07-160929	9/29/2016	N	K1611704	**113**	-	-	**113**	-	-	-	-	-	0.050	U	MBK	**17.8**	-	-	**5.3**	-	-	**0.40**	-	-	**7.14**	-	-	**1.37**	-	-
YVD-07	YVD-07-161213	12/13/2016	N	K1615083	**120**	-	-	**120**	-	-	-	-	-	0.050	U	-	**25.9**	-	-	**6.38**	-	-	**0.40**	-	-	**10.2**	-	-	**2.15**	-	-
YVD-07	YVD-030717-07	3/7/2017	N	K1702324	**107**	-	-	**107**	-	-	-	-	-	1	U	-	**17.6**	-	-	**5.34**	-	-	**0.43**	-	-	**6.47**	-	-	**1.74**	J	HTQ
YVD-07	YVD-060517-15	6/5/2017	N	K1705754	**105**	-	-	**105**	-	-	-	-	-	0.050	U	-	**19.4**	-	-	**6.07**	-	-	**0.39**	-	-	**7.31**	-	-	**2.07**	-	-
YVD-07	YVD-092617-21	9/26/2017	N	K1710333	**116**	-	-	**116**	-	-	-	-	-	0.050	U	-	**25.4**	-	-	**7.45**	-	-	**0.35**	-	-	**9.27**	-	-	**3.47**	-	-
YVD-07	YVD-120417-11	12/4/2017	N	K1713026	**130**	-	-	**130**	-	-	-	-	-	0.050	U	-	**29.5**	-	-	**8.32**	-	-	**0.37**	-	-	**11.1**	-	-	**4.40**	-	-
YVD-07	YVD-060418-23	6/4/2018	N	874662	**126**	-	-	**126**	-	-	0.47	U	FBK	-	-	-	**34.0**	-	-	**10.5**	-	-	**0.30**	-	-	**13.35**	-	-	**3.34**	-	-

Table 8
Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3-G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-07	YVD-060319-16	6/3/2019	N	992053	**127**	-	-	**127**	-	-	0.070	U	-	-	-	-	**31.0**	-	-	**5.83**	-	-	**0.17**	-	-	**11.75**	-	-	**1.86**	-	-
YVD-07	YVD-060920-27	6/9/2020	N	009269	**145**	-	-	**145**	-	-	0.070	U	-	-	-	-	**33.8**	-	-	**8.90**	-	-	**0.29**	-	-	**13.70**	-	-	**4.86**	-	-
YVD-07	YVD-060821-34	6/8/2021	N	124212	**142**	-	-	**142**	-	-	0.070	U	-	-	-	-	**33.1**	-	-	**7.68**	-	-	**0.22**	-	-	**13.45**	-	-	**3.34**	-	-
YVD-07	YVD-060622-21	6/6/2022	N	K2206160	**-**	-	-	**-**	-	-	-	-	-	-	-	-	**-**	-	-	**-**	-	-	**-**	-	-	**-**	-	-	**4.30**	-	-
YVD-07	YVD-060622-22	6/6/2022	FD	K2206160	**-**	-	-	**-**	-	-	-	-	-	-	-	-	**-**	-	-	**-**	-	-	**-**	-	-	**-**	-	-	**4.30**	-	-
YVD-08	YVD-08-130919	09/19/2013	N	SWI0138	**354**	-	-	**355**	-	-	-	-	-	0.1	U	-	**126**	-	-	**145**	-	-	5	U	-	**43.8**	-	-	**8**	-	-
YVD-08	YVD-08-131211	12/11/2013	N	SWL0063	**259**	-	-	**260**	-	-	-	-	-	-	R	MSD	**134**	-	-	**123**	-	-	5	U	-	**53.8**	-	-	**22.5**	-	-
YVD-08	YVD-08-140317	03/17/2014	N	SXC0095	**294**	-	-	**295**	-	-	-	-	-	**0.146**	-	-	**122**	-	-	**128**	-	-	5	U	-	**42.0**	-	-	**14.3**	-	-
YVD-08	YVD-08-140602	06/02/2014	N	SXF0017	**279**	-	-	**280**	-	-	-	-	-	0.1	U	-	**138**	-	-	**118**	-	-	2	U	-	**64.6**	-	-	**14.7**	-	-
YVD-08	YVD-08-140923	09/23/2014	N	SXI0173	**249**	-	-	**250**	-	-	-	-	-	0.1	U	-	**103**	-	-	**122**	-	-	2.5	U	-	**36.3**	-	-	**8.1**	-	-
YVD-08	YVD-08-141216	12/16/2014	N	SXL0108	**264**	-	-	**265**	-	-	-	-	-	0.1	U	-	**111**	-	-	**126**	-	-	2.5	U	-	**41.4**	-	-	**14**	-	-
YVD-08	YVD-08-150317	03/17/2015	N	5904541	**230**	-	-	**230**	-	-	-	-	-	0.1	U	-	**110**	-	-	**120**	-	-	2.5	U	-	**40.0**	-	-	**13**	J-	MSD
YVD-08	YVD-D3-150317	03/17/2015	FD	5904541	**240**	-	-	**240**	-	-	-	-	-	0.1	U	-	**100**	-	-	**130**	-	-	0.5	U	-	**39.0**	-	-	**14**	J-	MSD
YVD-08	YVD-08-150617	06/17/2015	N	59010961	**280**	J	FDP	**280**	J	FDP	-	-	-	**0.14**	-	-	**110**	-	-	**120**	-	-	2.5	U	-	**40.0**	-	-	**19**	-	-
YVD-08	YVD-D3-150617	06/17/2015	FD	59010961	**220**	J	FDP	**220**	J	FDP	-	-	-	0.1	U	-	**110**	-	-	**140**	-	-	5	U	-	**39.0**	-	-	**19**	-	-
YVD-08	YVD-08-150924	09/24/2015	N	59020391	**260**	-	-	**260**	-	-	-	-	-	0.1	UJ	MSD	**110**	-	-	**120**	-	-	2.5	U	-	**44.0**	-	-	**20**	J+	MSD
YVD-08	YVD-08-151215	12/15/2015	N	59025501	**260**	-	-	**260**	-	-	-	-	-	-	R	MSD	**120**	-	-	**120**	-	-	2.5	U	-	**44.0**	-	-	**26**	-	-
YVD-08	YVD-D3-151215	12/15/2015	FD	59025501	**250**	-	-	**250**	-	-	-	-	-	**0.15**	J-	MSD	**120**	-	-	**110**	-	-	5	U	-	**46.0**	-	-	**26**	-	-
YVD-08	YVD-08-160310	03/10/2016	N	59029941	**240**	-	-	**240**	-	-	-	-	-	0.1	U	-	**120**	-	-	**120**	-	-	2.5	U	-	**44.0**	-	-	**32**	-	-
YVD-08	YVD-08-160622	6/22/2016	N	59037271	**230**	-	-	**230**	-	-	-	-	-	0.1	UJ	MSD	**120**	-	-	**110**	-	-	2.5	U	-	**46.0**	-	-	**34**	-	-
YVD-08	YVD-D3-160622	6/22/2016	FD	59037271	**230**	-	-	**230**	-	-	-	-	-	0.1	UJ	FBK, MSD	**120**	-	-	**120**	-	-	0.5	U	-	**46.0**	-	-	**34**	-	-
YVD-08	YVD-08-160927	9/27/2016	N	K1611565	**239**	-	-	**239**	-	-	-	-	-	0.050	U	MBK	**120**	-	-	**96.0**	-	-	**0.18**	J	-	**47.0**	-	-	**30.6**	-	-
YVD-08	YVD-08-161213	12/13/2016	N	K1615045	**222**	-	-	**222**	-	-	-	-	-	0.050	U	-	**122**	-	-	**89.3**	-	-	**0.23**	-	-	**41.9**	-	-	**34.5**	J	HTQ
YVD-08	YVD-030917-24	3/9/2017	N	K1702448	**263**	-	-	**263**	-	-	-	-	-	0.050	U	-	**136**	-	-	**95.2**	-	-	**0.20**	J	-	**44.4**	-	-	**37.3**	J	HTQ
YVD-08	YVD-060717-29	6/7/2017	N	K1705833	**236**	-	-	**236**	-	-	-	-	-	0.050	U	-	**139**	-	-	**94.3**	-	-	**0.17**	J	-	**48.3**	-	-	**44.0**	-	-
YVD-08	YVD-092617-19	9/26/2017	N	K1710333	**271**	-	-	**271**	-	-	-	-	-	0.050	U	-	**137**	-	-	**98.0**	-	-	**0.19**	J	-	**44.3**	-	-	**38.6**	J	HTQ
YVD-08	YVD-120517-23	12/5/2017	N	K1713157	**233**	-	-	**233**	-	-	-	-	-	0.050	U	-	**147**	-	-	**98.8**	-	-	**0.20**	J	-	**48.1**	-	-	**49.3**	-	-
YVD-08	YVD-031918-15	3/19/2018	N	870634	**250**	-	-	**250**	-	-	0.070	U	-	-	-	-	**134**	-	-	**103**	-	-	**0.15**	-	-	**45.95**	-	-	**46.3**	-	-
YVD-08	YVD-060518-31	6/5/2018	N	874860	**238**	-	-	**238**	-	-	0.070	U	-	-	-	-	**136**	-	-	**99.0**	-	-	**0.16**	-	-	**47.45**	-	-	**53.0**	-	-
YVD-08	YVD-090918-04	9/9/2018	N	880601	**237**	-	-	**237**	-	-	0.070	U	-	-	-	-	**146**	-	-	**103**	-	-	**0.18**	-	-	**49.15**	-	-	**54.4**	-	-
YVD-08	YVD-121118-19	12/11/2018	N	884939	**227**	-	-	**227**	-	-	0.070	U	-	-	-	-	**138**	-	-	**117**	-	-	**0.16**	-	-	**45.85**	-	-	**59.4**	-	-
YVD-08	YVD-031719-03	3/17/2019	N	988239	**234**	-	-	**234**	-	-	0.070	U	-	-	-	-	**138**	-	-	**119**	-	-	0.22	U	FBK	**46.30**	-	-	**54.8**	-	-
YVD-08	YVD-060319-21	6/3/2019	N	992053	**240**	-	-	**240**	-	-	0.070	U	-	-	-	-	**138**	-	-	**100**	-	-	**0.10**	-	-	**46.10**	-	-	**50.0**	-	-
YVD-08	YVD-090919-02	9/9/2019	N	998357	**226**	-	-	**226**	-	-	0.070	U	-	-	-	-	**139**	-	-	**89.8**	-	-	**0.15**	-	-	**45.70**	-	-	**62.0**	-	-
YVD-08	YVD-120919-02	12/9/2019	N	902276	**227**	-	-	**227**	-	-	0.070	U	-	-	-	-	**132**	-	-	**95.6**	-	-	**0.16**	-	-	**44.60**	-	-	**61.8**	-	-
YVD-08	YVD-120919-04	12/9/2019	FD	902276	**226**	-	-	**226**	-	-	0.070	U	-	-	-	-	**130**	-	-	**94.3**	-	-	**0.15**	-	-	**44.50**	-	-	**61.6**	-	-
YVD-08	YVD-033120-17	3/31/2020	N	006260	**213**	-	-	**213**	-	-	0.070	U	-	-	-	-	**132**	-	-	**96.5**	-	-	**0.18**	-	-	**45.65**	-	-	**68**	-	-
YVD-08	YVD-060920-23	6/9/2020	N	009269	**217**	-	-	**217**	-	-	0.070	U	-	-	-	-	**132**	-	-	**96.1**	-	-	**0.19**	-	-	**44.75**	-	-	**66.6**	-	-
YVD-08	YVD-092120-11	9/21/2020	N	013896	**216**	-	-	**216**	-	-	0.070	U	-	-	-	-	**134**	-	-	**96.2**	-	-	**0.16**	-	-	**45.80**	-	-	**66**	-	-
YVD-08	YVD-120720-11	12/7/2020	N	017035	**215**	-	-	**215**	-	-	0.070	U	-	-	-	-	**132**	-	-	**107**	-	-	**0.20**	-	-	**45.85**	-	-	**62.2**	-	-
YVD-08	YVD-030121-07	3/1/2021	N	119931	**217**	-	-	**217**	-	-	0.070	U	-	-	-	-	**135**	-	-	**92.9**	-	-	**0.20**	-	-	**45.80**	-	-	**68.8**	-	-
YVD-08	YVD-060821-28	6/8/2021	N	124212	**218**	-	-	**218**	-	-	0.070	U	-	-	-	-	**130**	-	-	**94.2**	-	-	**0.17**	-	-	**44.90**	-	-	**62**	-	-
YVD-08	YVD-121521-20	12/15/2021	N	K2114550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**60.8**	J	HTQ, MS
YVD-08	YVD-031522-12	3/15/2022	N	K2202727	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**68.1**	-	-

Table 8
Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3-G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-08	YVD-060722-27	6/7/2022	N	K2206237	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**69.1**	J	HTQ
YVD-09	YVD-09-130919	09/19/2013	N	SWI0138	**369**	-	-	**370**	-	-	-	-	-	0.1	U	-	**107**	-	-	**96.3**	-	-	5	U	-	**39.3**	-	-	**74.7**	-	-
YVD-09	YVD-09-131212	12/12/2013	N	SWL0078	**384**	-	-	**385**	-	-	-	-	-	0.02	U	-	**109**	-	-	**87.2**	-	-	5	U	-	**42.0**	-	-	**64.4**	-	-
YVD-09	YVD-09-140319	03/19/2014	N	SXC0107	**388**	-	-	**390**	-	-	-	-	-	0.1	U	-	**109**	-	-	**104**	-	-	**5.5**		-	**40.8**	-	-	**62.4**	-	-
YVD-09	YVD-09-140603	06/03/2014	N	SXF0025	**367**	-	-	**368**	-	-	-	-	-	0.1	U	-	**113**	-	-	**89.8**	-	-	5	U	-	**44.5**	-	-	**57.1**	-	-
YVD-09	YVD-09-140924	09/24/2014	N	SXI0173	**359**	-	-	**360**	-	-	-	-	-	0.1	U	-	**118**	-	-	**68.2**	-	-	5	U	-	**41.7**	-	-	**48**	-	-
YVD-09	YVD-09-141217	12/17/2014	N	SXL0121	**359**	-	-	**360**	-	-	-	-	-	0.1	U	-	**130**	-	-	**85**	-	-	5	U	-	**56.3**	-	-	**53.9**	-	-
YVD-09	YVD-09-150318	03/18/2015	N	5904651	**350**	-	-	**350**	-	-	-	-	-	**0.14**	-	-	**110**	-	-	**74**	-	-	5	U	-	**46.0**	-	-	**47**	-	-
YVD-09	YVD-09-150617	06/17/2015	N	59010961	**350**	-	-	**350**	-	-	-	-	-	**0.14**	-	-	**110**	-	-	**89**	-	-	5	U	-	**43.0**	-	-	**54**	-	-
YVD-09	YVD-09-150923	09/23/2015	N	59020391	**330**	-	-	**330**	-	-	-	-	-	**0.21**	J	MSD	**110**	-	-	**78**	-	-	0.5	U	-	**46.0**	-	-	**56**	J+	MSD
YVD-09	YVD-09-151215	12/15/2015	N	59025501	**340**	-	-	**340**	-	-	-	-	-	-	R	MSD	**110**	-	-	**77**	-	-	5	U	-	**42.0**	-	-	**52**	-	-
YVD-09	YVD-09-160310	03/10/2016	N	59029941	**360**	-	-	**360**	-	-	-	-	-	**0.12**	-	-	**110**	-	-	**72**	-	-	5	U	-	**42.0**	-	-	**48**	-	-
YVD-09	YVD-09-160622	6/22/2016	N	59037271	**350**	-	-	**350**	-	-	-	-	-	0.1	UJ	MSD	**100**	-	-	**76**	-	-	5	U	-	**42.0**	-	-	**49**	-	-
YVD-09	YVD-09-160929	9/29/2016	N	K1611704	**347**	-	-	**347**	-	-	-	-	-	0.050	U	MBK	**103**	-	-	**66.7**	-	-	**0.34**	-	-	**41.2**	-	-	**43.2**	-	-
YVD-09	YVD-09-161213	12/13/2016	N	K1615045	**340**	-	-	**340**	-	-	-	-	-	0.050	U	-	**107**	-	-	**59.8**	-	-	**0.40**	-	-	**38.1**	-	-	**42.8**	J	HTQ
YVD-09	YVD-D2-161213	12/13/2016	FD	K1615045	**340**	-	-	**340**	-	-	-	-	-	0.050	U	-	**108**	-	-	**61.4**	-	-	**0.40**	-	-	**37.1**	-	-	**43.3**	J	HTQ
YVD-09	YVD-031317-35	3/13/2017	N	K1702489	**329**	-	-	**329**	-	-	-	-	-	0.050	U	-	**108**	-	-	**63.9**	-	-	**0.37**	-	-	**39.2**	-	-	**44.3**	-	-
YVD-09	YVD-060517-08	6/5/2017	N	K1705702	**341**	-	-	**341**	-	-	-	-	-	0.050	U	-	**110**	-	-	**62.6**	-	-	**0.39**	-	-	**39.4**	-	-	**44.6**	-	-
YVD-09	YVD-092617-29	9/26/2017	N	K1710381	**351**	-	-	**351**	-	-	-	-	-	0.050	U	-	**109**	-	-	**61.0**	-	-	**0.38**	-	-	**37.2**	-	-	**44.1**	J	HTQ
YVD-09	YVD-092617-30	9/26/2017	FD	K1710381	**415**	-	-	**415**	-	-	-	-	-	0.050	U	-	**109**	-	-	**61.1**	-	-	**0.38**	-	-	**37.4**	-	-	**44.1**	J	HTQ
YVD-09	YVD-120517-21	12/5/2017	N	K1713091	**351**	-	-	**351**	-	-	-	-	-	0.050	U	-	**108**	-	-	**63.0**	-	-	**0.38**	-	-	**35.9**	-	-	**46.9**	-	-
YVD-09	YVD-031918-18	3/19/2018	N	870634	**350**	-	-	**350**	-	-	0.070	U	-	-	-	-	**108**	-	-	**69.2**	-	-	**0.34**	-	-	**35.90**	-	-	**48.5**	-	-
YVD-09	YVD-060318-13	6/3/2018	N	874568	**348**	-	-	**348**	-	-	0.070	U	-	-	-	-	**107**	-	-	**63.4**	-	-	**0.36**	-	-	**37.75**	-	-	**50.6**	-	-
YVD-09	YVD-090918-06	9/9/2018	N	880601	**354**	-	-	**354**	-	-	0.070	U	-	-	-	-	**108**	-	-	**71.0**	-	-	**0.35**	-	-	**35.90**	-	-	**51.4**	-	-
YVD-09	YVD-121118-15	12/11/2018	N	884939	**358**	-	-	**358**	-	-	0.070	U	-	-	-	-	**102**	-	-	**65.6**	-	-	**0.34**	-	-	**34.25**	-	-	**52.8**	-	-
YVD-09	YVD-121118-17	12/11/2018	FD	884939	**357**	-	-	**357**	-	-	0.070	U	-	-	-	-	**103**	-	-	**68.0**	-	-	**0.33**	-	-	**34.55**	-	-	**54.6**	-	-
YVD-09	YVD-031719-05	3/17/2019	N	988239	**356**	-	-	**356**	-	-	0.070	U	-	-	-	-	**104**	-	-	**67.4**	-	-	0.31	U	FBK	**35.75**	-	-	**56.0**	-	-
YVD-09	YVD-060319-15	6/3/2019	N	992053	**353**	-	-	**353**	-	-	0.070	U	-	-	-	-	**104**	-	-	**43.4**	-	-	**0.36**	-	-	**35.65**	-	-	**53.3**	-	-
YVD-09	YVD-090919-04	9/9/2019	N	998357	**363**	-	-	**363**	-	-	0.070	U	-	-	-	-	**110**	-	-	**64.7**	-	-	**0.33**	-	-	**36.45**	-	-	**58.2**	-	-
YVD-09	YVD-120919-06	12/9/2019	N	902276	**356**	-	-	**356**	-	-	0.070	U	-	-	-	-	**106**	-	-	**69.1**	-	-	**0.37**	-	-	**35.75**	-	-	**57.0**	-	-
YVD-09	YVD-033020-05	3/30/2020	N	006241	**350**	-	-	**350**	-	-	0.070	U	-	-	-	-	**102**	-	-	**71.4**	-	-	**0.37**	-	-	**35.15**	-	-	**55.2**	-	-
YVD-09	YVD-060920-24	6/9/2020	N	009269	**350**	-	-	**350**	-	-	0.070	U	-	-	-	-	**102**	-	-	**68.8**	-	-	**0.31**	-	-	**35.35**	-	-	**55.2**	-	-
YVD-09	YVD-092120-16	9/21/2020	N	013896	**347**	-	-	**347**	-	-	0.070	U	-	-	-	-	**101**	-	-	**72.5**	-	-	0.10	U	-	**35.05**	-	-	**56.2**	-	-
YVD-09	YVD-120720-13	12/7/2020	N	017035	**345**	-	-	**345**	-	-	0.070	U	-	-	-	-	**101**	-	-	**69.4**	-	-	**0.26**	-	-	**35.65**	-	-	**54**	-	-
YVD-09	YVD-030121-05	3/1/2021	N	119931	**347**	-	-	**347**	-	-	0.070	U	-	-	-	-	**104**	-	-	**68.8**	-	-	**0.35**	-	-	**36.30**	-	-	**57.4**	-	-
YVD-09	YVD-060721-18	6/7/2021	N	124105	**352**	-	-	**352**	-	-	0.070	U	-	-	-	-	**102**	-	-	**75.9**	-	-	**0.32**	-	-	**35.50**	-	-	**54.4**	-	-
YVD-09	YVD-121421-09	12/14/2021	N	K2114499	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**55.3**	J	HTQ, MS
YVD-09	YVD-031522-14	3/15/2022	N	K2202727	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**60.8**	-	-
YVD-09	YVD-060622-12	6/6/2022	N	K2206160	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**60.7**	-	-
YVD-10	YVD-10-130917	09/17/2013	N	SWI0123	**464**	-	-	**465**	-	-	-	-	-	0.1	U	-	**216**	-	-	**95.4**	-	-	5	U	-	**51.8**	-	-	**95**		-
YVD-10	YVD-10-131212	12/12/2013	N	SWL0078	**459**	-	-	**460**	-	-	-	-	-	0.02	U	-	**202**	-	-	**91.4**	-	-	5	U	-	**55.6**	-	-	**86.9**	-	-
YVD-10	YVD-10-140319	03/19/2014	N	SXC0107	**489**	-	-	**490**	-	-	-	-	-	**0.109**	-	-	**218**	-	-	**86.8**	-	-	5	U	-	**54.0**	-	-	**77.6**	-	-
YVD-10	YVD-10-140603	06/03/2014	N	SXF0025	**487**	-	-	**488**	-	-	-	-	-	**0.105**	-	-	**232**	-	-	**94.3**	-	-	5	U	-	**58.6**	-	-	**86.1**	-	-
YVD-10	YVD-10-140924	09/24/2014	N	SXI0173	**523**	-	-	**525**	-	-	-	-	-	0.1	U	-	**276**	-	-	**115**	-	-	5	U	-	**65.8**	-	-	**97.2**	-	-
YVD-10	YVD-10-141217	12/17/2014	N	SXL0144	**503**	-	-	**505**	-	-	-	-	-	0.5	U	-	**248**	-	-	**97.9**	-	-	5	U	-	**60.4**	-	-	**78.7**	-	-
YVD-10	YVD-10-150318	03/18/2015	N	5904651	**590**	-	-	**590**	-	-	-	-	-	0.1	U	-	**400**	-	-	**180**	-	-	5	U	-	**92.0**	-	-	**120**	-	-

Table 8
Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3-G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-10	YVD-10-150617	06/17/2015	N	59010961	**600**	-	-	**600**	-	-	-	-	-	**0.12**	-	-	**390**	-	-	**39**	-	-	5	U	-	**95.0**	-	-	**20**	-	-
YVD-10	YVD-10-150923	09/23/2015	N	59020391	**620**	-	-	**620**	-	-	-	-	-	**0.72**	J	MSD	**330**	-	-	**160**	-	-	5	U	-	**89.0**	-	-	**120**	J+	MSD
YVD-10	YVD-10-151214	12/14/2015	N	59025351	**600**	-	-	**600**	-	-	-	-	-	-	R	MSD	**350**	-	-	**150**	-	-	5	U	-	**84.0**	-	-	**120**	-	-
YVD-10	YVD-10-160309	03/09/2016	N	59029711	**520**	-	-	**520**	-	-	-	-	-	0.1	UJ	FDP	**310**	-	-	**140**	-	-	5	U	-	**73.0**	-	-	**98**	-	-
YVD-10	YVD-10-160621	6/21/2016	N	59037271	**510**	-	-	**510**	-	-	-	-	-	**0.11**	J-	MSD	**270**	-	-	**120**	-	-	5	U	-	**73.0**	-	-	**96**	-	-
YVD-10	YVD-10-160929	9/29/2016	N	K1611698	**513**	-	-	**513**	-	-	-	-	-	0.050	U	MBK	**286**	-	-	**105**	-	-	0.2	U	MBK	**63.1**	-	-	**84**	-	-
YVD-10	YVD-10-161212	12/12/2016	N	K1615029	**524**	-	-	**524**	-	-	-	-	-	0.050	U	-	**303**	-	-	**141**	-	-	**0.10**	J	-	**66.9**	-	-	**109**	J	HTQ
YVD-10	YVD-030917-27	3/9/2017	N	K1702448	**637**	-	-	**637**	-	-	-	-	-	0.050	U	-	**569**	-	-	**173**	-	-	**0.09**	J	-	**128**	-	-	**123**	J	HTQ
YVD-10	YVD-060617-22	6/6/2017	N	K1705754	**525**	-	-	**525**	-	-	-	-	-	0.050	U	-	**349**	-	-	**125**	-	-	**0.14**	J	-	**76.7**	-	-	**99.4**	-	-
YVD-10	YVD-092617-31	9/26/2017	N	K1710381	**523**	-	-	**523**	-	-	-	-	-	0.050	U	-	**316**	-	-	**113**	-	-	**0.09**	J	-	**66.7**	-	-	**93.9**	J	HTQ
YVD-10	YVD-120517-30	12/5/2017	N	K1713091	**540**	-	-	**540**	-	-	-	-	-	0.050	U	-	**327**	-	-	**128**	-	-	**0.11**	J	-	**67.3**	-	-	**109**	J	HTQ
YVD-10	YVD-031818-06	3/18/2018	N	870610	**527**	-	-	**527**	-	-	0.070	U	-	-	-	-	**296**	-	-	**121**	-	-	0.10	U	-	**61.00**	-	-	**91.4**	-	-
YVD-10	YVD-060318-06	6/3/2018	N	874568	**543**	-	-	**543**	-	-	0.08	U	FBK	-	-	-	**298**	-	-	**122**	-	-	0.10	U	-	**65.00**	-	-	**92.0**	-	-
YVD-10	YVD-090918-13	9/9/2018	N	880601	**557**	-	-	**557**	-	-	0.070	U	-	-	-	-	**308**	-	-	**128**	-	-	**0.10**	-	-	**63.50**	-	-	**90.0**	-	-
YVD-10	YVD-121018-08	12/10/2018	N	884857	**544**	-	-	**544**	-	-	0.070	U	-	-	-	-	**274**	-	-	**124**	-	-	0.10	U	FBK	**58.00**	J	MSD	**87.0**	-	-
YVD-10	YVD-031819-16	3/18/2019	N	988273	**527**	-	-	**527**	-	-	0.070	U	-	-	-	-	**276**	-	-	**141**	-	-	**0.10**	-	-	**58.00**	-	-	**81.6**	-	-
YVD-10	YVD-060319-18	6/3/2019	N	992053	**568**	-	-	**568**	-	-	0.070	U	-	-	-	-	**297**	-	-	**135**	-	-	0.10	U	-	**63.00**	-	-	**74.4**	-	-
YVD-10	YVD-091019-20	9/10/2019	N	998438	**584**	-	-	**584**	-	-	0.070	U	-	-	-	-	**256**	-	-	**92.0**	-	-	0.10	U	-	**54.50**	-	-	**69.0**	-	-
YVD-10	YVD-121019-21	12/10/2019	N	902321	**576**	-	-	**576**	-	-	0.070	U	-	-	-	-	**286**	-	-	**114**	-	-	0.10	U	-	**59.50**	-	-	**84.4**	-	-
YVD-10	YVD-033020-08	3/30/2020	N	006241	**568**	-	-	**568**	-	-	0.070	U	-	-	-	-	**264**	-	-	**104**	-	-	0.10	U	-	**57.00**	-	-	**73.2**	-	-
YVD-10	YVD-060920-12	6/9/2020	N	009269	**586**	-	-	**586**	-	-	0.070	U	-	-	-	-	**293**	-	-	**128**	-	-	0.10	U	-	**62.00**	-	-	**82.6**	-	-
YVD-10	YVD-092020-08	9/20/2020	N	013864	**596**	-	-	**596**	-	-	0.070	U	-	-	-	-	**306**	-	-	**110**	-	-	0.10	U	-	**63.50**	-	-	**76**	-	-
YVD-10	YVD-120720-12	12/7/2020	N	017035	**612**	-	-	**612**	-	-	0.070	U	-	-	-	-	**331**	-	-	**161**	-	-	0.10	U	-	**71.00**	-	-	**76**	-	-
YVD-10	YVD-030121-12	3/1/2021	N	119931	**770**	-	-	**770**	-	-	0.070	U	-	-	-	-	**482**	-	-	**90.0**	-	-	0.10	U	-	**97.00**	-	-	**44.4**	-	-
YVD-10	YVD-060621-07	6/6/2021	N	124053	**710**	-	-	**710**	-	-	0.070	U	-	-	-	-	**320**	-	-	**85.3**	-	-	**0.49**	-	-	**68.00**	-	-	**53.1**	-	-
YVD-10	YVD-121421-06	12/14/2021	N	K2114499	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**75.8**	-	-
YVD-10	YVD-031422-06	3/14/2022	N	K2202633	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**17.7**	-	-
YVD-10	YVD-060522-06	6/5/2022	N	K2206116	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**55.3**	-	-
YVD-11	YVD-11-130923	09/23/2013	N	SWI0178	**254**	J	FDP	**255**	J	FDP	-	-	-	0.1	U	-	**183**	-	-	-	-	-	-	-	-	**51.9**	-	-	-	-	-
YVD-11	YVD-D2-130923	09/23/2013	FD	SWI0178	**199**	J	FDP	**200**	J	FDP	-	-	-	0.1	U	-	**175**	-	-	-	-	-	-	-	-	**46.0**	-	-	-	-	-
YVD-11	YVD-11-130926	09/26/2013	N	SWI0190	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**54.7**	-	-	5	U	-	-	-	-	**38.4**	-	-
YVD-11	YVD-D3-130926	09/26/2013	FD	SWI0190	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**61.4**	-	-	5	U	-	-	-	-	**46.2**	-	-
YVD-11	YVD-11-131212	12/12/2013	N	SWL0073	**294**	-	-	**295**	-	-	-	-	-	0.02	UJ	MSD	**171**	-	-	**58.7**	-	-	5	U	-	**43.4**	-	-	**49.9**	-	-
YVD-11	YVD-11-140318	03/18/2014	N	SXC0107	**324**	-	-	**325**	-	-	-	-	-	0.1	U	-	**183**	-	-	**61.6**	-	-	5	U	-	**44.4**	-	-	**43.7**	-	-
YVD-11	YVD-11-140603	06/03/2014	N	SXF0017	**312**	-	-	**313**	-	-	-	-	-	0.1	U	-	**176**	-	-	**67.2**	-	-	5	U	-	**50.3**	-	-	**49.1**	-	-
YVD-11	YVD-11-140924	09/24/2014	N	SXI0173	**294**	-	-	**295**	-	-	-	-	-	0.1	U	-	**193**	-	-	**67.2**	-	-	2.5	U	-	**47.9**	-	-	**46.6**	-	-
YVD-11	YVD-11-141217	12/17/2014	N	SXL0121	**289**	-	-	**290**	-	-	-	-	-	0.1	U	-	**198**	-	-	**72.1**	-	-	5	U	-	**53.6**	-	-	**49.1**	-	-
YVD-11	YVD-11-150317	03/17/2015	N	5904651	**290**	-	-	**290**	-	-	-	-	-	0.1	U	-	**190**	-	-	**76**	-	-	5	U	-	**51.0**	-	-	**52**	-	-
YVD-11	YVD-11-150616	06/16/2015	N	59010961	**290**	-	-	**290**	-	-	-	-	-	0.1	U	-	**200**	-	-	**86**	-	-	5	U	-	**50.0**	-	-	**56**	-	-
YVD-11	YVD-11-150923	09/23/2015	N	59020281	**310**	-	-	**310**	-	-	-	-	-	**0.12**	-	-	**200**	-	-	**90**	-	-	5	U	-	**55.0**	-	-	**66**	-	-
YVD-11	YVD-11-151215	12/15/2015	N	59025431	**110**	J	FDP	**110**	J	FDP	-	-	-	-	R	MSD	**210**	-	-	**100**	-	-	5	U	-	**60.0**	-	-	**74**	-	-
YVD-11	YVD-D2-151215	12/15/2015	FD	59025431	**360**	J	FDP	**360**	J	FDP	-	-	-	-	R	MSD	**210**	-	-	**98**	-	-	0.5	U	-	**58.0**	-	-	**70**	-	-
YVD-11	YVD-11-160309	03/09/2016	N	59029711	**340**	-	-	**340**	-	-	-	-	-	**0.14**	J	FDP	**200**	-	-	**99**	-	-	5	U	-	**53.0**	-	-	**65**	-	-
YVD-11	YVD-11-160621	6/21/2016	N	59037151	**340**	-	-	**340**	-	-	-	-	-	0.1	U	-	**200**	-	-	**120**	-	-	5	U	-	**56.0**	-	-	**71**	-	-
YVD-11	YVD-11-160927	9/27/2016	N	K1611629	**375**	-	-	**375**	-	-	-	-	-	0.050	U	MBK	**204**	-	-	**82.0**	-	-	**0.18**	J	-	**52.6**	-	-	**48.9**	J	HTQ
YVD-11	YVD-11-161214	12/14/2016	N	K1615126	**352**	-	-	**352**	-	-	-	-	-	0.050	U	-	**209**	-	-	**82.5**	-	-	**0.19**	J	-	**57.8**	-	-	**55.5**	-	-
YVD-11	YVD-031317-37	3/13/2017	N	K1702489	**353**	-	-	**353**	-	-	-	-	-	0.050	U	-	**235**	-	-	**102**	-	-	**0.21**	-	-	**62.1**	-	-	**77.3**	-	-
YVD-11	YVD-060517-10	6/5/2017	N	K1705702	**341**	-	-	**341**	-	-	-	-	-	0.050	U	-	**271**	-	-	**129**	-	-	**0.18**	J	-	**69.1**	-	-	**97.1**	-	-

Table 8
Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3-G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-11	YVD-092617-26	9/26/2017	N	K1710381	**347**	-	-	**347**	-	-	-	-	-	0.050	U	-	**276**	-	-	**135**	-	-	**0.17**	J	-	**68.6**	-	-	**103**	J	HTQ
YVD-11	YVD-120417-06	12/4/2017	N	K1713026	**361**	-	-	**361**	-	-	-	-	-	0.050	U	-	**248**	-	-	**110**	-	-	**0.16**	J	-	**58.6**	-	-	**84.8**	-	-
YVD-11	YVD-031918-12	3/19/2018	N	870634	**386**	-	-	**386**	-	-	0.07	U	-	-	-	-	**223**	-	-	**91.4**	-	-	**0.11**	-	-	**51.50**	-	-	**61.8**	-	-
YVD-11	YVD-031918-14	3/19/2018	FD	870634	**387**	-	-	**387**	-	-	0.07	U	-	-	-	-	**222**	-	-	**89.1**	-	-	**0.12**	-	-	**50.50**	-	-	**61.2**	-	-
YVD-11	YVD-060418-14	6/4/2018	N	874662	**377**	-	-	**377**	-	-	0.34	U	FBK	-	-	-	**224**	-	-	**114**	-	-	**0.12**	-	-	**57.00**	-	-	**68.6**	-	-
YVD-11	YVD-060418-16	6/4/2018	FD	874662	**380**	-	-	**380**	-	-	0.08	U	FBK	-	-	-	**231**	-	-	**114**	-	-	**0.12**	-	-	**57.50**	-	-	**68.2**	-	-
YVD-11	YVD-090918-05	9/9/2018	N	880601	**395**	-	-	**395**	-	-	0.070	U	-	-	-	-	**223**	-	-	**102**	-	-	**0.20**	-	-	**53.00**	-	-	**62.8**	-	-
YVD-11	YVD-121018-10	12/10/2018	N	884857	**410**	-	-	**410**	-	-	0.070	U	-	-	-	-	**182**	-	-	**75.6**	-	-	0.14	U	FBK	**44.90**	J	MSD	**41.1**	-	-
YVD-11	YVD-031819-18	3/18/2019	N	988273	**440**	-	-	**440**	-	-	0.070	U	-	-	-	-	**158**	-	-	**38.6**	-	-	**0.12**	-	-	**38.85**	-	-	**20.2**	-	-
YVD-11	YVD-060219-02	6/2/2019	N	991939	**424**	-	-	**424**	-	-	0.070	U	-	-	-	-	**156**	-	-	49.2	U	FBK	0.59	U	FBK	**38.30**	-	-	**26.4**	-	-
YVD-11	YVD-060219-04	6/2/2019	FD	991939	**423**	-	-	**423**	-	-	0.070	U	-	-	-	-	**156**	-	-	49.8	U	FBK	0.60	U	FBK	**38.70**	-	-	**26.7**	-	-
YVD-11	YVD-090919-05	9/9/2019	N	998357	**423**	-	-	**423**	-	-	0.070	U	-	-	-	-	**164**	-	-	**52.2**	-	-	**0.12**	-	-	**39.95**	-	-	**32.8**	-	-
YVD-11	YVD-120919-13	12/9/2019	N	902276	**429**	-	-	**429**	-	-	0.070	U	-	-	-	-	**162**	-	-	**46.1**	-	-	**0.11**	-	-	**39.70**	-	-	**27.8**	-	-
YVD-11	YVD-033020-10	3/30/2020	N	006241	**426**	-	-	**426**	-	-	0.070	U	-	-	-	-	**150**	-	-	**39.6**	-	-	**0.13**	-	-	**36.55**	-	-	**23.8**	-	-
YVD-11	YVD-061020-31	6/10/2020	N	009361	**420**	-	-	**420**	-	-	0.070	U	-	-	-	-	**151**	-	-	**47.0**	-	-	**0.13**	-	-	**36.55**	J	MS	**24.9**	-	-
YVD-11	YVD-092120-20	9/21/2020	N	013896	**413**	-	-	**413**	-	-	0.070	U	-	-	-	-	**162**	-	-	**69.2**	-	-	**0.12**	-	-	**40.85**	-	-	**37.5**	-	-
YVD-11	YVD-120720-10	12/7/2020	N	017035	**412**	-	-	**412**	-	-	0.070	U	-	-	-	-	**179**	-	-	**78.2**	-	-	**0.24**	-	-	**44.40**	-	-	**48**	-	-
YVD-11	YVD-030121-06	3/1/2021	N	119931	**422**	-	-	**422**	-	-	0.070	U	-	-	-	-	**178**	-	-	**85.9**	-	-	**0.17**	-	-	**45.60**	-	-	**44.1**	-	-
YVD-11	YVD-060821-23	6/8/2021	N	124212	**414**	-	-	**414**	-	-	0.070	U	-	-	-	-	**170**	-	-	**85.4**	-	-	**0.11**	-	-	**41.90**	-	-	**41.7**	-	-
YVD-11	YVD-121421-05	12/14/2021	N	K2114499	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**46.1**	-	-
YVD-11	YVD-031522-19	3/15/2022	N	K2202727	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**44.6**	-	-
YVD-11	YVD-060622-18	6/6/2022	N	K2206160	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**82.7**	-	-
YVD-12	YVD-12-130919	09/19/2013	N	SWI0142	**204**	-	-	**205**	-	-	-	-	-	0.1	U	-	**98.6**	-	-	**98.2**	-	-	5	U	-	**37.5**	-	-	-	-	-
YVD-12	YVD-12-130925	09/25/2013	N	SWI0175	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**15**	-	-
YVD-12	YVD-12-131211	12/11/2013	N	SWL0073	**194**	-	-	**195**	-	-	-	-	-	0.02	UJ	MSD	**93.5**	-	-	**97**	-	-	5	U	-	**36.2**	-	-	**20.1**	-	-
YVD-12	YVD-12-140318	03/18/2014	N	SXC0095	**204**	-	-	**205**	-	-	-	-	-	**0.248**	-	-	**92.9**	-	-	**95.2**	-	-	5	U	-	**35.9**	-	-	**17**	-	-
YVD-12	YVD-12-140603	06/03/2014	N	SXF0017	**199**	-	-	**200**	-	-	-	-	-	0.1	U	-	**92.6**	-	-	**8.33**	-	-	0.5	U	-	**34.9**	-	-	**1.44**	-	-
YVD-12	YVD-12-140922	09/22/2014	N	SXI0148	**189**	-	-	**190**	-	-	-	-	-	0.1	U	-	**98.4**	-	-	**78.5**	-	-	5	U	-	**39.1**	-	-	**13.3**	-	-
YVD-12	YVD-D2-140922	09/22/2014	FD	SXI0148	**194**	-	-	**195**	-	-	-	-	-	0.1	U	-	**99.3**	-	-	**82.4**	-	-	2	U	-	**39.0**	-	-	**15.5**	-	-
YVD-12	YVD-12-141216	12/16/2014	N	SXL0121	**194**	-	-	**195**	-	-	-	-	-	0.1	U	-	**99.3**	-	-	**84.1**	-	-	5	U	-	**39.6**	-	-	**15.1**	-	-
YVD-12	YVD-12-150317	03/17/2015	N	5904541	**190**	-	-	**190**	-	-	-	-	-	0.1	U	-	**93.0**	-	-	**75**	-	-	5	U	-	**37.0**	-	-	**14**	J-	MSD
YVD-12	YVD-12-150617	06/17/2015	N	59010961	**190**	-	-	**190**	-	-	-	-	-	0.1	U	-	**90.0**	-	-	**84**	-	-	5	U	-	**35.0**	-	-	**12**	-	-
YVD-12	YVD-12-150924	09/24/2015	N	59020391	**190**	-	-	**190**	-	-	-	-	-	0.1	UJ	MSD	**92.0**	-	-	**78**	-	-	5	U	-	**39.0**	-	-	**15**	J+	MSD
YVD-12	YVD-12-151216	12/16/2015	N	59025501	**210**	-	-	**210**	-	-	-	-	-	-	R	MSD	**95.0**	-	-	**76**	-	-	5	U	-	**37.0**	-	-	**14**	-	-
YVD-12	YVD-12-160309	03/09/2016	N	59029941	**210**	-	-	**210**	-	-	-	-	-	0.1	U	-	**95.0**	-	-	**73**	-	-	5	U	-	**35.0**	-	-	**13**	-	-
YVD-12	YVD-D3-160309	03/09/2016	FD	59029941	**200**	-	-	**200**	-	-	-	-	-	0.1	U	-	**95.0**	-	-	**79**	-	-	0.5	U	-	**36.0**	-	-	**15**	-	-
YVD-12	YVD-12-160622	6/22/2016	N	59037271	**190**	-	-	**190**	-	-	-	-	-	0.1	UJ	MSD	**89.0**	-	-	**90**	-	-	5	U	-	**36.0**	-	-	**14**	-	-
YVD-12	YVD-12-160929	9/29/2016	N	K1611704	**188**	-	-	**188**	-	-	-	-	-	0.050	U	MBK	**88.9**	-	-	**83.5**	-	-	**0.33**	-	-	**37.2**	-	-	**13.5**	-	-
YVD-12	YVD-12-161213	12/13/2016	N	K1615083	**183**	-	-	**183**	-	-	-	-	-	0.050	U	-	**93.4**	-	-	**81.7**	-	-	**0.33**	-	-	**33.6**	-	-	**12.2**	-	-
YVD-12	YVD-030917-20	3/9/2017	N	K1702404	**132**	-	-	**132**	-	-	-	-	-	0.050	U	-	**97.3**	-	-	**91.7**	-	-	**0.38**	-	-	**35.4**	-	-	**13.4**	-	-
YVD-12	YVD-060617-25	6/6/2017	N	K1705833	**183**	-	-	**183**	-	-	-	-	-	0.050	U	-	**98.4**	-	-	**94.1**	-	-	**0.32**	-	-	**35.8**	-	-	**13.6**	-	-
YVD-12	YVD-092517-15	9/25/2017	N	K1710333	**188**	-	-	**188**	-	-	-	-	-	0.050	U	-	**97.6**	-	-	**94.7**	-	-	**0.34**	-	-	**34.2**	-	-	**14.0**	-	-
YVD-12	YVD-120417-03	12/4/2017	N	K1713026	**186**	-	-	**186**	-	-	-	-	-	0.050	U	-	**89.7**	-	-	**85.4**	-	-	**0.41**	-	-	**32.9**	-	-	**13.4**	-	-
YVD-12	YVD-031918-13	3/19/2018	N	870610	**181**	-	-	**181**	-	-	0.070	U	-	-	-	-	**98.0**	-	-	**97.7**	-	-	**0.35**	-	-	**35.25**	-	-	**13.6**	-	-
YVD-12	YVD-060318-11	6/3/2018	N	874568	**178**	-	-	**178**	-	-	0.070	U	FBK	-	-	-	**103**	-	-	**100**	-	-	**0.34**	-	-	**38.35**	-	-	**15.1**	-	-
YVD-12	YVD-090918-16	9/9/2018	N	880601	**185**	-	-	**185**	-	-	0.070	U	-	-	-	-	**110**	-	-	**105**	-	-	**0.33**	-	-	**38.65**	-	-	**15.8**	-	-
YVD-12	YVD-121018-13	12/10/2018	N	884857	**184**	-	-	**184**	-	-	0.070	U	-	-	-	-	**106**	-	-	**98.9**	-	-	0.29	U	FBK	**37.65**	J	MSD	**15.5**	-	-

Table 8
Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3-G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-12	YVD-031719-07	3/17/2019	N	988239	**189**	-	-	**189**	-	-	0.070	U	-	-	-	-	**104**	-	-	**97.6**	-	-	0.31	U	FBK	**38.00**	-	-	**18.4**	-	-
YVD-12	YVD-060319-27	6/3/2019	N	992053	**185**	-	-	**185**	-	-	0.070	U	-	-	-	-	**104**	-	-	**96.7**	-	-	**0.24**	-	-	**38.05**	-	-	**18.9**	-	-
YVD-12	YVD-090919-16	9/9/2019	N	998357	**185**	-	-	**185**	-	-	0.070	U	-	-	-	-	**106**	-	-	**95.6**	-	-	**0.29**	-	-	**37.50**	-	-	**16.5**	-	-
YVD-12	YVD-120919-12	12/9/2019	N	902276	**190**	-	-	**190**	-	-	**0.30**	-	-	-	-	-	**104**	-	-	**97.8**	-	-	**0.32**	-	-	**38.80**	-	-	**19.6**	-	-
YVD-12	YVD-033020-11	3/30/2020	N	006241	**183**	-	-	**183**	-	-	0.070	U	-	-	-	-	**99.5**	-	-	**99.5**	-	-	**0.32**	-	-	**36.25**	-	-	**17.1**	-	-
YVD-12	YVD-060920-22	6/9/2020	N	009269	**186**	-	-	**186**	-	-	0.070	U	-	-	-	-	**110**	-	-	**101**	-	-	**0.29**	-	-	**38.70**	-	-	**19.5**	-	-
YVD-12	YVD-092120-18	9/21/2020	N	013896	**180**	-	-	**180**	-	-	0.070	U	-	-	-	-	**96.5**	-	-	**99.3**	-	-	**0.27**	-	-	**35.45**	-	-	**13.8**	-	-
YVD-12	YVD-120820-19	12/8/2020	N	017137	**184**	-	-	**184**	-	-	0.070	U	-	-	-	-	**101**	-	-	**114**	-	-	**0.28**	-	-	**36.85**	-	-	**15.2**	-	-
YVD-12	YVD-030221-19	3/2/2021	N	120034	**184**	-	-	**184**	-	-	0.070	U	-	-	-	-	**101**	-	-	**98.1**	-	-	**0.30**	-	-	**36.55**	-	-	**14.8**	-	-
YVD-12	YVD-060821-25	6/8/2021	N	124212	**180**	-	-	**180**	-	-	0.070	U	-	-	-	-	**102**	-	-	**100**	-	-	**0.25**	-	-	**36.95**	-	-	**14.4**	-	-
YVD-12	YVD-121521-18	12/15/2021	N	K2114550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**13.4**	J	HTQ, MS
YVD-12	YVD-031522-21	3/15/2022	N	K2202727	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**14.6**	-	-
YVD-12	YVD-060622-20	6/6/2022	N	K2206160	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**19.5**	-	-
YVD-13	YVD-13-130919	09/19/2013	N	SWI0138	**134**	-	-	**135**	-	-	-	-	-	0.1	U	-	**102**	-	-	**90.3**	-	-	5	U	-	**29.9**	-	-	**27.6**	-	-
YVD-13	YVD-13-131211	12/11/2013	N	SWL0073	**139**	-	-	**140**	-	-	-	-	-	0.02	UJ	MSD	**101**	-	-	**77.8**	-	-	5	U	-	**29.4**	-	-	**21.7**	-	-
YVD-13	YVD-13-140318	03/18/2014	N	SXC0095	**134**	-	-	**135**	-	-	-	-	-	**0.288**		-	**102**	-	-	**80.3**	-	-	5	U	-	**29.3**	-	-	**24.2**	-	-
YVD-13	YVD-13-140603	06/03/2014	N	SXF0017	**129**	-	-	**130**	-	-	-	-	-	**0.103**		-	**94.8**	-	-	**39.7**	-	-	2	U	-	**27.7**	-	-	**12.4**	-	-
YVD-13	YVD-13-140923	09/23/2014	N	SXI0173	**124**	-	-	**125**	-	-	-	-	-	0.1	U	-	**104**	-	-	**81.7**	-	-	5	U	-	**29.0**	-	-	**26.7**	-	-
YVD-13	YVD-13-141217	12/17/2014	N	SXL0121	**124**	-	-	**125**	-	-	-	-	-	0.1	U	-	**114**	-	-	**86.5**	-	-	5	U	-	**33.1**	-	-	**27.3**	-	-
YVD-13	YVD-13-150317	03/17/2015	N	5904541	**130**	-	-	**130**	-	-	-	-	-	0.1	U	-	**100**	-	-	**72**	-	-	5	U	-	**30.0**	-	-	**24**	J-	MSD
YVD-13	YVD-13-150617	06/17/2015	N	59010961	**140**	-	-	**140**	-	-	-	-	-	0.1	U	-	**110**	-	-	**81**	-	-	5	U	-	**30.0**	-	-	**27**	-	-
YVD-13	YVD-13-150924	09/24/2015	N	59020391	**150**	-	-	**150**	-	-	-	-	-	0.1	UJ	MSD	**98.0**	-	-	**70**	-	-	5	U	-	**31.0**	-	-	**26**	J+	MSD
YVD-13	YVD-13-151216	12/16/2015	N	59025501	**140**	-	-	**140**	-	-	-	-	-	-	R	MSD	**100**	-	-	**69**	-	-	5	U	-	**30.0**	-	-	**26**	-	-
YVD-13	YVD-13-160309	03/09/2016	N	59029941	**140**	-	-	**140**	-	-	-	-	-	0.1	U	-	**100**	-	-	**85**	-	-	5	U	-	**29.0**	-	-	**32**	-	-
YVD-13	YVD-13-160622	6/22/2016	N	59037271	**130**	-	-	**130**	-	-	-	-	-	0.1	UJ	MSD	**100**	-	-	**76**	-	-	5	U	-	**30.0**	-	-	**28**	-	-
YVD-13	YVD-13-160928	9/28/2016	N	K1611698	**133**	-	-	**133**	-	-	-	-	-	0.050	U	MBK	**101**	-	-	**60.0**	-	-	**0.30**	-	-	**28.1**	-	-	**23.5**	J	HTQ
YVD-13	YVD-13-161214	12/13/2016	N	K1615083	**132**	-	-	**132**	-	-	-	-	-	0.050	U	-	**100**	-	-	**57.3**	-	-	**0.33**	-	-	**27.5**	-	-	**23.1**	-	-
YVD-13	YVD-030717-08	3/7/2017	N	K1702324	**138**	-	-	**138**	-	-	-	-	-	1	U	-	**96.9**	-	-	**52.8**	-	-	**0.35**	-	-	**26.7**	-	-	**23.3**	J	HTQ
YVD-13	YVD-030717-10	3/7/2017	FD	K1702324	**139**	-	-	**139**	-	-	-	-	-	1	U	-	**97.3**	-	-	**53.6**	-	-	**0.37**	-	-	**27.1**	-	-	**23.7**	J	HTQ
YVD-13	YVD-060717-33	6/7/2017	N	K1705833	**134**	-	-	**134**	-	-	-	-	-	0.050	U	-	**99.0**	-	-	**54.6**	-	-	**0.30**	-	-	**27.9**	-	-	**22.7**	-	-
YVD-13	YVD-092617-25	9/26/2017	N	K1710333	**142**	-	-	**142**	-	-	-	-	-	0.050	U	-	**94.9**	-	-	**52.8**	-	-	**0.33**	-	-	**24.5**	-	-	**23.2**	-	-
YVD-13	YVD-120417-07	12/4/2017	N	K1713026	**141**	-	-	**141**	-	-	-	-	-	0.050	U	-	**93.4**	-	-	**53.9**	-	-	**0.36**	-	-	**24.5**	-	-	**24.3**	-	-
YVD-13	YVD-031918-19	3/19/2018	N	870634	**138**	-	-	**138**	-	-	0.070	U	-	-	-	-	**96.0**	-	-	**63.0**	-	-	**0.34**	-	-	**25.45**	-	-	**25.8**	-	-
YVD-13	YVD-060318-09	6/3/2018	N	874568	**137**	-	-	**137**	-	-	0.070	U	-	-	-	-	**91.0**	-	-	**63.3**	-	-	**0.35**	-	-	**25.90**	-	-	**25.2**	-	-
YVD-13	YVD-090918-14	9/9/2018	N	880601	**140**	-	-	**140**	-	-	0.070	U	-	-	-	-	**92.0**	-	-	**66.6**	-	-	**0.34**	-	-	**24.55**	-	-	**26.1**	-	-
YVD-13	YVD-121018-11	12/10/2018	N	884857	**142**	-	-	**142**	-	-	0.070	U	-	-	-	-	**87.5**	-	-	**70.8**	-	-	0.25	U	FBK	**24.20**	J	MSD	**28.6**	-	-
YVD-13	YVD-031819-15	3/18/2019	N	988273	**153**	-	-	**153**	-	-	0.070	U	-	-	-	-	**91.0**	-	-	**74.4**	-	-	**0.31**	-	-	**24.50**	-	-	**29.1**	-	-
YVD-13	YVD-060319-25	6/3/2019	N	992053	**142**	-	-	**142**	-	-	0.070	U	-	-	-	-	**90.0**	-	-	**40.9**	-	-	**0.23**	-	-	**24.35**	-	-	**28.0**	-	-
YVD-13	YVD-090919-10	9/9/2019	N	998357	**143**	-	-	**143**	-	-	0.070	U	-	-	-	-	**90.0**	-	-	**67.6**	-	-	**0.38**	-	-	**23.95**	-	-	**31.0**	-	-
YVD-13	YVD-120919-10	12/9/2019	N	902276	**138**	-	-	**138**	-	-	0.070	U	-	-	-	-	**88.0**	-	-	**73.4**	-	-	**0.37**	-	-	**24.10**	-	-	**30.9**	-	-
YVD-13	YVD-033020-09	3/30/2020	N	006241	**140**	-	-	**140**	-	-	0.070	U	-	-	-	-	**87.5**	-	-	**77.0**	-	-	**0.34**	-	-	**24.05**	-	-	**30.9**	-	-
YVD-13	YVD-060920-21	6/9/2020	N	009269	**139**	-	-	**139**	-	-	0.070	U	-	-	-	-	**89.5**	-	-	**71.1**	-	-	**0.29**	-	-	**24.55**	-	-	**28.5**	-	-
YVD-13	YVD-092120-13	9/21/2020	N	013896	**138**	-	-	**138**	-	-	0.070	U	-	-	-	-	**92.0**	-	-	**79.7**	-	-	**0.30**	-	-	**25.05**	-	-	**32.3**	-	-
YVD-13	YVD-120820-17	12/8/2020	N	017137	**137**	-	-	**137**	-	-	0.070	U	-	-	-	-	**90.5**	-	-	**64.8**	-	-	**0.33**	-	-	**25.05**	-	-	**27.1**	-	-
YVD-13	YVD-030221-15	3/2/2021	N	120034	**144**	-	-	**144**	-	-	0.070	U	-	-	-	-	**93.5**	-	-	**83.0**	-	-	**0.34**	-	-	**25.50**	-	-	**34.3**	-	-
YVD-13	YVD-060821-32	6/8/2021	N	124212	**142**	-	-	**142**	-	-	0.070	U	-	-	-	-	**92.5**	-	-	**82.8**	-	-	**0.31**	-	-	**25.45**	-	-	**34**	-	-
YVD-13	YVD-121521-16	12/15/2021	N	K2114550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**34**	J	HTQ, MS

Table 8
Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3-G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-13	YVD-031522-20	3/15/2022	N	K2202727	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**35.7**	-	-
YVD-13	YVD-060722-24	6/7/2022	N	K2206237	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**36.2**	J	HTQ
YVD-14	YVD-14-130918	09/18/2013	N	SWI0123	**605**	-	-	**605**	-	-	-	-	-	0.1	U	-	**260**	-	-	**118**	-	-	5	U	-	**65.4**	-	-	**112**	-	-
YVD-14	YVD-14-131212	12/12/2013	N	SWL0078	**544**	-	-	**545**	-	-	-	-	-	0.02	U	-	**249**	-	-	**104**	-	-	5	U	-	**65.6**	-	-	**105**	-	-
YVD-14	YVD-14-140319	03/19/2014	N	SXC0107	**634**	-	-	**635**	-	-	-	-	-	0.1	U	-	**248**	-	-	**108**	-	-	5	U	-	**64.5**	-	-	**101**	-	-
YVD-14	YVD-14-140604	06/04/2014	N	SXF0025	**569**	-	-	**570**	-	-	-	-	-	0.1	U	-	**240**	-	-	**109**	-	-	5	U	-	**63.2**	-	-	**102**	-	-
YVD-14	YVD-14-140924	09/24/2014	N	SXI0173	**554**	-	-	**555**	-	-	-	-	-	**0.107**	-	-	**268**	-	-	**110**	-	-	5	U	-	**72.0**	-	-	**96.7**	-	-
YVD-14	YVD-14-141217	12/17/2014	N	SXL0121	**539**	-	-	**540**	-	-	-	-	-	0.1	U	-	**252**	-	-	**110**	-	-	5	U	-	**70.9**	-	-	**96.1**	-	-
YVD-14	YVD-14-150318	03/18/2015	N	5904651	**530**	-	-	**530**	-	-	-	-	-	**0.11**	-	-	**260**	-	-	**110**	-	-	5	U	-	**70.0**	-	-	**91**	-	-
YVD-14R	YVD-14R-151216	12/16/2015	N	59025501	**550**	-	-	**550**	-	-	-	-	-	-	R	MSD	**250**	-	-	**110**	-	-	5	U	-	**69.0**	-	-	**98**	-	-
YVD-14R	YVD-14R-160309	03/09/2016	N	59029941	**600**	-	-	**600**	-	-	-	-	-	0.1	U	-	**250**	-	-	**110**	-	-	5	U	-	**67.0**	-	-	**100**	-	-
YVD-14R	YVD-14R-160622	6/22/2016	N	59037271	**490**	-	-	**490**	-	-	-	-	-	0.1	UJ	MSD	**230**	-	-	**110**	-	-	5	U	-	**67.0**	-	-	**110**	-	-
YVD-14R	YVD-14R-160928	9/28/2016	N	K1611698	**535**	-	-	**535**	-	-	-	-	-	0.050	U	MBK	**252**	-	-	**95.7**	-	-	**0.16**	J	-	**65.9**	-	-	**92.1**	J	HTQ
YVD-14R	YVD-14R-161212	12/12/2016	N	K1615029	**578**	-	-	**578**	-	-	-	-	-	0.050	U	-	**251**	-	-	**94.7**	-	-	**0.24**	-	-	**65.7**	-	-	**92.3**	J	HTQ
YVD-14R	YVD-D1-161212	12/12/2016	FD	K1615029	**571**	-	-	**571**	-	-	-	-	-	0.050	U	-	**255**	-	-	**93.3**	-	-	**0.19**	-	-	**66.5**	-	-	**92.3**	J	HTQ
YVD-14R	YVD-030917-19	3/9/2017	N	K1702404	**526**	-	-	**526**	-	-	-	-	-	0.050	U	-	**257**	-	-	**97.0**	-	-	**0.18**	J	-	**66.1**	-	-	**91.1**	-	-
YVD-14R	YVD-030917-21	3/9/2017	FD	K1702404	**514**	-	-	**514**	-	-	-	-	-	0.050	U	-	**251**	-	-	**95.0**	-	-	**0.19**	J	-	**65.2**	-	-	**92.2**	J	HTQ
YVD-14R	YVD-060517-06	6/5/2017	N	K1705702	**505**	-	-	**505**	-	-	-	-	-	0.050	U	-	**243**	-	-	**98.4**	-	-	**0.20**	-	-	**62.3**	-	-	**95.7**	-	-
YVD-14R	YVD-092517-14	9/25/2017	N	K1710333	**515**	-	-	**515**	-	-	-	-	-	0.050	U	-	**238**	-	-	**99.8**	-	-	**0.18**	J	-	**61.2**	-	-	**97.3**	-	-
YVD-14R	YVD-120417-12	12/4/2017	N	K1713026	**504**	-	-	**504**	-	-	-	-	-	0.050	U	-	**230**	-	-	**98.3**	-	-	**0.22**	-	-	**59.3**	-	-	**96.7**	-	-
YVD-14R	YVD-031818-11	3/18/2018	N	870610	**514**	-	-	**514**	-	-	**0.17**	-	-	-	-	-	**232**	-	-	**102**	-	-	**0.13**	-	-	**60.00**	-	-	**90.2**	-	-
YVD-14R	YVD-060318-04	6/3/2018	N	874568	**521**	-	-	**521**	-	-	0.19	U	FBK	-	-	-	**233**	-	-	**105**	-	-	**0.15**	-	-	**63.00**	-	-	**96.5**	-	-
YVD-14R	YVD-090918-09	9/9/2018	N	880601	**532**	-	-	**532**	-	-	0.070	U	-	-	-	-	**250**	-	-	**115**	-	-	**0.18**	-	-	**63.50**	-	-	**115**	-	-
YVD-14R	YVD-121018-02	12/10/2018	N	884857	**528**	-	-	**528**	-	-	0.070	U	-	-	-	-	**256**	-	-	**133**	-	-	0.15	U	FBK	**66.00**	J	MSD	**117**	-	-
YVD-14R	YVD-121018-04	12/10/2018	FD	884857	**528**	-	-	**528**	-	-	0.070	U	-	-	-	-	**254**	-	-	**132**	-	-	0.15	U	FBK	**66.00**	J	MSD	**115**	-	-
YVD-14R	YVD-031819-12	3/18/2019	N	988273	**531**	-	-	**531**	-	-	0.070	U	-	-	-	-	**277**	-	-	**151**	-	-	**0.44**	J	DUP	**71.50**	-	-	**138**	-	-
YVD-14R	YVD-031819-14	3/18/2019	FD	988273	**532**	-	-	**532**	-	-	0.070	U	-	-	-	-	**275**	-	-	**148**	-	-	**0.13**	J	DUP	**70.50**	-	-	**135**	-	-
YVD-14R	YVD-060319-22	6/3/2019	N	992053	**542**	-	-	**542**	-	-	**0.12**	U	-	-	-	-	**284**	-	-	**149**	-	-	**0.22**	-	-	**73.50**	-	-	**136**	-	-
YVD-14R	YVD-060319-24	6/3/2019	FD	992053	**538**	-	-	**538**	-	-	0.070	U	-	-	-	-	**270**	-	-	**130**	-	-	0.10	U	-	**71.50**	-	-	**138**	-	-
YVD-14R	YVD-090919-13	9/9/2019	N	998357	**560**	-	-	**560**	-	-	0.070	U	-	-	-	-	**280**	-	-	**130**	-	-	**0.13**	-	-	**73.00**	-	-	**140**	-	-
YVD-14R	YVD-121019-15	12/10/2019	N	902321	**533**	-	-	**533**	-	-	0.070	U	-	-	-	-	**255**	-	-	**128**	-	-	**0.13**	-	-	**66.50**	-	-	**126**	-	-
YVD-14R	YVD-121019-17	12/10/2019	FD	902321	**543**	-	-	**543**	-	-	0.070	U	-	-	-	-	**256**	-	-	**128**	-	-	**0.13**	-	-	**66.50**	-	-	**125**	-	-
YVD-14R	YVD-033020-02	3/30/2020	N	006241	**555**	-	-	**555**	-	-	0.070	U	-	-	-	-	**262**	-	-	**134**	-	-	**0.13**	-	-	**68.00**	-	-	**126**	-	-
YVD-14R	YVD-033020-04	3/30/2020	FD	006241	**556**	-	-	**556**	-	-	0.070	U	-	-	-	-	**262**	-	-	**132**	-	-	**0.13**	-	-	**68.00**	-	-	**127**	-	-
YVD-14R	YVD-060920-20	6/9/2020	N	009269	**569**	-	-	**569**	-	-	0.070	U	-	-	-	-	**269**	-	-	**149**	-	-	**0.11**	-	-	**70.50**	-	-	**130**	-	-
YVD-14R	YVD-092120-14	9/21/2020	N	013896	**560**	-	-	**560**	-	-	0.070	U	-	-	-	-	**260**	-	-	**141**	-	-	**0.21**	-	-	**68.50**	-	-	**122**	-	-
YVD-14R	YVD-120820-20	12/8/2020	N	017137	**556**	-	-	**556**	-	-	0.070	U	-	-	-	-	**263**	-	-	**148**	-	-	**0.12**	-	-	**68.00**	-	-	**119**	-	-
YVD-14R	YVD-030121-08	3/1/2021	N	119931	**564**	-	-	**564**	-	-	0.070	U	-	-	-	-	**266**	-	-	**139**	-	-	**0.14**	-	-	**70.50**	-	-	**129**	-	-
YVD-14R	YVD-060621-09	6/6/2021	N	124053	**558**	-	-	**558**	-	-	0.070	U	-	-	-	-	**262**	-	-	**131**	-	-	**0.14**	-	-	**68.00**	-	-	**121**	-	-
YVD-14R	YVD-121421-08	12/14/2021	N	K2114499	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**118**	J	HTQ, MS
YVD-14R	YVD-031422-07	3/14/2022	N	K2202633	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**134**	-	-
YVD-14R	YVD-060522-09	6/5/2022	N	K2206116	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**125**	-	-
YVD-15	YVD-15-130917	09/17/2013	N	SWI0123	**514**	-	-	**515**	-	-	-	-	-	0.1	U	-	**125**	-	-	**62.8**	-	-	5	U	-	**51.6**	-	-	**72.5**	-	-
YVD-15	YVD-15-131212	12/12/2013	N	SWL0078	**494**	-	-	**495**	-	-	-	-	-	0.02	U	-	**131**	-	-	**120**	-	-	5	U	-	**59.4**	-	-	**71.2**	-	-
YVD-15	YVD-15-140319	03/19/2014	N	SXC0107	**534**	-	-	**535**	-	-	-	-	-	**0.112**	-	-	**124**	-	-	**54.9**	-	-	5	U	-	**57.9**	-	-	**47.4**	-	-
YVD-15	YVD-15-140603	06/03/2014	N	SXF0025	**509**	-	-	**510**	-	-	-	-	-	0.1	U	-	**138**	-	-	**82.5**	-	-	5	U	-	**64.7**	-	-	**88.1**	-	-

Table 8
Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3-G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-15	YVD-15-140924	09/24/2014	N	SXI0173	**541**	-	-	**545**	-	-	-	-	-	**0.246**	-	-	**132**	-	-	**58.7**	-	-	5	U	-	**56.9**	-	-	**54.8**	-	-
YVD-15	YVD-15-141217	12/17/2014	N	SXL0121	**518**	-	-	**520**	-	-	-	-	-	0.1	U	-	**175**	-	-	**57.6**	-	-	5	U	-	**81.6**	-	-	**66.9**	-	-
YVD-15	YVD-15-150317	03/17/2015	N	5904651	**550**	-	-	**550**	-	-	-	-	-	0.1	U	-	**280**	-	-	**65**	-	-	5	U	-	**130.0**	-	-	**67**	-	-
YVD-15	YVD-15-150617	06/17/2015	N	59011021	**550**	-	-	**550**	-	-	-	-	-	0.1	U	-	**140**	-	-	**42**	-	-	0.5	U	-	**66.0**	J	RPD	**39**	J-	MSD, HTQ
YVD-15	YVD-15-150925	09/25/2015	N	59020431	**480**	-	-	**480**	-	-	-	-	-	0.1	U	-	**98.0**	-	-	**22**	-	-	5	U	-	**46.0**	-	-	**14**	-	-
YVD-15	YVD-15-151215	12/15/2015	N	59025431	**540**	J	FDP	**540**	J	FDP	-	-	-	-	R	MSD	**120**	-	-	**37**	-	-	5	U	-	**59.0**	-	-	**38**	-	-
YVD-15	YVD-15-160309	03/09/2016	N	59029711	**520**	-	-	**520**	-	-	-	-	-	0.1	UJ	FDP	**120**	-	-	**32**	-	-	5	U	-	**60.0**	-	-	**36**	-	-
YVD-15	YVD-15-160621	6/21/2016	N	59037271	**430**	-	-	**430**	-	-	-	-	-	**0.13**	J-	MSD	**110**	-	-	**26**	-	-	5	U	-	**56.0**	-	-	**31**	-	-
YVD-15	YVD-15-160928	9/28/2016	N	K1611629	**401**	-	-	**401**	-	-	-	-	-	0.050	U	MBK	**112**	-	-	**22.5**	-	-	**0.29**	-	-	**50.9**	-	-	**26.6**	-	-
YVD-15	YVD-15-161215	12/15/2016	N	K1615126	**395**	-	-	**395**	-	-	-	-	-	0.050	U	-	**113**	-	-	**22.1**	-	-	**0.32**	-	-	**50.4**	-	-	**25.5**	-	-
YVD-15	YVD-030917-23	3/9/2017	N	K1702404	**395**	-	-	**395**	-	-	-	-	-	0.050	U	-	**119**	-	-	**23.0**	-	-	**0.34**	-	-	**52.9**	-	-	**25.0**	J	HTQ
YVD-15	YVD-060617-20	6/6/2017	N	K1705754	**399**	-	-	**399**	-	-	-	-	-	0.050	U	-	**126**	-	-	**21.8**	-	-	**0.32**	-	-	**54.6**	-	-	**23.0**	-	-
YVD-15	YVD-092517-10	9/25/2017	N	K1710333	**412**	-	-	**412**	-	-	-	-	-	0.050	U	-	**112**	-	-	**22.1**	-	-	**0.35**	-	-	**50.2**	-	-	**21.8**	-	-
YVD-15	YVD-120517-28	12/5/2017	N	K1713091	**414**	-	-	**414**	-	-	-	-	-	0.050	U	-	**112**	-	-	**21.8**	-	-	**0.34**	-	-	**48.0**	-	-	**22.7**	J	HTQ
YVD-15	YVD-031818-09	3/18/2018	N	870610	**397**	-	-	**397**	-	-	0.070	U	-	-	-	-	**104**	-	-	**21.7**	-	-	**0.32**	-	-	**46.60**	-	-	**24.4**	-	-
YVD-15	YVD-060318-08	6/3/2018	N	874568	**401**	-	-	**401**	-	-	0.070	U	FBK	-	-	-	**100**	-	-	**22.0**	-	-	**0.34**	-	-	**45.50**	-	-	**27.0**	-	-
YVD-15	YVD-090918-11	9/9/2018	N	880601	**395**	-	-	**395**	-	-	0.070	U	-	-	-	-	**97.5**	-	-	**22.8**	-	-	**0.35**	-	-	**42.70**	-	-	**24.4**	-	-
YVD-15	YVD-121018-06	12/10/2018	N	884857	**400**	-	-	**400**	-	-	0.070	U	-	-	-	-	**92.5**	-	-	**24.3**	-	-	0.33	U	FBK	**41.00**	J	MSD	**26.3**	-	-
YVD-15	YVD-031719-10	3/17/2019	N	988239	**394**	-	-	**394**	-	-	0.070	U	-	-	-	-	**91.5**	-	-	**21.1**	-	-	0.31	U	FBK	**39.75**	-	-	**24.3**	-	-
YVD-15	YVD-060419-29	6/4/2019	N	992242	**390**	-	-	**390**	-	-	0.070	U	-	-	-	-	**92.0**	-	-	**19.5**	-	-	**0.30**	-	-	**40.80**	-	-	**23.6**	-	-
YVD-15	YVD-090919-11	9/9/2019	N	998357	**407**	-	-	**407**	-	-	0.070	U	-	-	-	-	**91.0**	-	-	**21.8**	-	-	**0.34**	-	-	**39.40**	-	-	**23.4**	-	-
YVD-15	YVD-121019-19	12/10/2019	N	902321	**400**	-	-	**400**	-	-	0.070	U	-	-	-	-	**88.0**	-	-	**20.5**	-	-	**0.37**	-	-	**38.65**	-	-	**23.5**	-	-
YVD-15	YVD-033020-06	3/30/2020	N	006241	**396**	-	-	**396**	-	-	0.070	U	-	-	-	-	**86.5**	-	-	**20.6**	-	-	**0.37**	-	-	**38.25**	-	-	**22.3**	-	-
YVD-15	YVD-060920-16	6/9/2020	N	009269	**397**	-	-	**397**	-	-	0.070	U	-	-	-	-	**86.5**	-	-	**20.8**	-	-	**0.31**	-	-	**38.10**	-	-	**21**	-	-
YVD-15	YVD-092020-09	9/20/2020	N	013864	**390**	-	-	**390**	-	-	0.070	U	-	-	-	-	**87.5**	-	-	**21.1**	-	-	**0.31**	-	-	**38.70**	-	-	**21.2**	-	-
YVD-15	YVD-120720-14	12/7/2020	N	017035	**390**	-	-	**390**	-	-	0.070	U	-	-	-	-	**87.0**	-	-	**20.7**	-	-	**0.42**	-	-	**39.00**	-	-	**19.7**	-	-
YVD-15	YVD-030121-14	3/1/2021	N	119931	**397**	-	-	**397**	-	-	0.070	U	-	-	-	-	**87.5**	-	-	**21.1**	-	-	**0.34**	-	-	**39.35**	-	-	**22**	-	-
YVD-15	YVD-060621-08	6/6/2021	N	124053	**428**	-	-	**428**	-	-	0.070	U	-	-	-	-	**94.5**	-	-	**21.8**	-	-	**0.29**	-	-	**41.65**	-	-	**21.6**	-	-
YVD-15	YVD-121421-07	12/14/2021	N	K2114499	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**15.1**	-	-
YVD-15	YVD-031422-05	3/14/2022	N	K2202633	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**34.5**	-	-
YVD-15	YVD-060522-07	6/5/2022	N	K2206116	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**16.3**	-	-
YVD-16	YVD-16-130923	09/23/2013	N	SWI0178	**391**	-	-	**391**	-	-	-	-	-	0.1	U	-	**85.0**	-	-	-	-	-	-	-	-	**32.9**	-	-	-	-	-
YVD-16	YVD-16-130926	09/26/2013	N	SWI0190	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**44.1**	-	-	5	U	-	-	-	-	**28.8**	-	-
YVD-16	YVD-16-131212	12/12/2013	N	SWL0073	**309**	-	-	**310**	-	-	-	-	-	0.02	UJ	MSD	**87.7**	-	-	**46.7**	-	-	5	U	-	**32.1**	-	-	**28.8**	-	-
YVD-16	YVD-16-140318	03/18/2014	N	SXC0107	**298**	-	-	**300**	-	-	-	-	-	0.1	U	-	**105.0**	-	-	**46.1**	-	-	5	U	-	**53.2**	-	-	**23.5**	-	-
YVD-16	YVD-16-140603	06/03/2014	N	SXF0017	**287**	-	-	**288**	-	-	-	-	-	0.1	U	-	**86.3**	-	-	**36.7**	-	-	2	U	-	**37.0**	-	-	**21.9**	-	-
YVD-16	YVD-16-140923	09/23/2014	N	SXI0173	**303**	-	-	**305**	-	-	-	-	-	0.1	U	-	**99.2**	-	-	**38**	-	-	2.5	U	-	**38.9**	-	-	**21.4**	-	-
YVD-16	YVD-16-141217	12/17/2014	N	SXL0121	**298**	-	-	**300**	-	-	-	-	-	0.1	U	-	**94.9**	-	-	**37.9**	-	-	2.5	U	-	**37.1**	-	-	**20.6**	-	-
YVD-16	YVD-D3-141217	12/17/2014	FD	SXL0121	**308**	-	-	**310**	-	-	-	-	-	0.1	U	-	**92.9**	-	-	**39.9**	-	-	0.5	U	-	**36.2**	-	-	**22.4**	-	-
YVD-16	YVD-16-150317	03/17/2015	N	5904651	**310**	-	-	**310**	-	-	-	-	-	**0.11**	-	-	**93.0**	-	-	**39**	-	-	2.5	U	-	**34.0**	-	-	**22**	-	-
YVD-16	YVD-16-150616	06/16/2015	N	59010961	**310**	-	-	**310**	-	-	-	-	-	**0.1**	-	-	**96.0**	-	-	**43**	-	-	2.5	U	-	**35.0**	-	-	**23**	-	-
YVD-16	YVD-16-150923	09/23/2015	N	59020281	**330**	-	-	**330**	-	-	-	-	-	0.1	U	-	**88.0**	-	-	**39**	-	-	2.5	U	-	**37.0**	-	-	**23**	-	-
YVD-16	YVD-16-151215	12/15/2015	N	59025431	**350**	J	FDP	**350**	J	FDP	-	-	-	-	R	MSD	**89.0**	-	-	**38**	-	-	2.5	U	-	**34.0**	-	-	**22**	-	-
YVD-16	YVD-16-160309	03/09/2016	N	59029711	**300**	-	-	**300**	-	-	-	-	-	**0.15**	J	FDP	**90.0**	-	-	**39**	-	-	2.5	U	-	**36.0**	-	-	**23**	-	-
YVD-16	YVD-16-160621	6/21/2016	N	59037151	**300**	-	-	**300**	-	-	-	-	-	0.1	U	-	**85.0**	-	-	**42**	-	-	2.5	U	-	**33.0**	-	-	**22**	-	-
YVD-16	YVD-D2-160621	6/21/2016	FD	59037151	**300**	-	-	**300**	-	-	-	-	-	0.1	U	-	**86.0**	-	-	**40**	-	-	0.5	U	-	**34.0**	-	-	**22**	-	-
YVD-16	YVD-16-160928	9/28/2016	N	K1611629	**301**	-	-	**301**	-	-	-	-	-	0.050	U	MBK	**92.4**	-	-	**33.3**	-	-	**0.22**	-	-	**33.2**	-	-	**19.7**	-	-

Table 8
Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3-G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-16	YVD-16-161215	12/15/2016	N	K1615126	**298**	-	-	**298**	-	-	-	-	-	0.050	U	-	**88.4**	-	-	**33.7**	-	-	**0.24**	-	-	**31.1**	-	-	**19.7**	-	-
YVD-16	YVD-030917-22	3/9/2017	N	K1702404	**295**	-	-	**295**	-	-	-	-	-	0.050	U	-	**87.1**	-	-	**33.9**	-	-	**0.25**	-	-	**31.2**	-	-	**20.1**	J	HTQ
YVD-16	YVD-060517-12	6/5/2017	N	K1705754	**298**	-	-	**298**	-	-	-	-	-	0.050	U	-	**86.8**	-	-	**33.6**	-	-	**0.25**	-	-	**31.6**	-	-	**19.7**	-	-
YVD-16	YVD-092617-28	9/26/2017	N	K1710381	**309**	-	-	**309**	-	-	-	-	-	0.050	U	-	**89.0**	-	-	**32.8**	-	-	**0.23**	-	-	**31.7**	-	-	**19.1**	J	HTQ
YVD-16	YVD-120517-22	12/5/2017	N	K1713091	**294**	-	-	**294**	-	-	-	-	-	0.050	U	-	**87.9**	-	-	**33.3**	-	-	**0.24**	-	-	**30.1**	-	-	**19.8**	J	HTQ
YVD-16	YVD-031918-16	3/19/2018	N	870634	**297**	-	-	**297**	-	-	0.070	U	-	-	-	-	**88.5**	-	-	**34.4**	-	-	**0.20**	-	-	**30.25**	-	-	**20.3**	-	-
YVD-16	YVD-060318-10	6/3/2018	N	874568	**314**	-	-	**314**	-	-	0.070	U	FBK	-	-	-	**90.0**	-	-	**34.9**	-	-	**0.22**	-	-	**32.80**	-	-	**20.7**	-	-
YVD-16	YVD-090918-07	9/9/2018	N	880601	**309**	-	-	**309**	-	-	0.070	U	-	-	-	-	**89.5**	-	-	**35.7**	-	-	**0.21**	-	-	**30.55**	-	-	**21.4**	-	-
YVD-16	YVD-121118-20	12/11/2018	N	884939	**306**	-	-	**306**	-	-	0.070	U	-	-	-	-	**89.5**	-	-	**32.6**	-	-	**0.19**	-	-	**31.05**	-	-	**21.8**	-	-
YVD-16	YVD-031719-08	3/17/2019	N	988239	**300**	-	-	**300**	-	-	0.070	U	-	-	-	-	**88.5**	-	-	**35.4**	-	-	0.18	U	FBK	**30.65**	-	-	**22.5**	-	-
YVD-16	YVD-060219-06	6/2/2019	N	991939	**301**	-	-	**301**	-	-	0.070	U	-	-	-	-	**88.5**	-	-	24.6	U	FBK	0.17	U	FBK	**30.90**	-	-	**23.3**	-	-
YVD-16	YVD-090919-07	9/9/2019	N	998357	**303**	-	-	**303**	-	-	0.070	U	-	-	-	-	**86.5**	-	-	**36.9**	-	-	**0.21**	-	-	**30.40**	-	-	**22.9**	-	-
YVD-16	YVD-120919-11	12/9/2019	N	902276	**296**	-	-	**296**	-	-	0.070	U	-	-	-	-	**86.0**	-	-	**36.7**	-	-	**0.24**	-	-	**30.35**	-	-	**23.5**	-	-
YVD-16	YVD-033120-16	3/31/2020	N	006260	**287**	-	-	**287**	-	-	0.070	U	-	-	-	-	**85.5**	-	-	**38.0**	-	-	**0.18**	-	-	**30.30**	-	-	**22.8**	-	-
YVD-16	YVD-061020-30	6/10/2020	N	009361	**289**	-	-	**289**	-	-	0.070	U	-	-	-	-	**81.5**	-	-	**37.8**	-	-	**0.17**	-	-	**28.80**	J	MS	**21.8**	-	-
YVD-16	YVD-092020-06	9/20/2020	N	013864	**292**	-	-	**292**	-	-	0.070	U	-	-	-	-	**88.0**	-	-	**39.0**	-	-	**0.17**	-	-	**31.40**	-	-	**22.4**	-	-
YVD-16	YVD-120720-08	12/7/2020	N	017035	**298**	-	-	**298**	-	-	0.070	U	-	-	-	-	**92.5**	-	-	**41.2**	-	-	**0.19**	-	-	**33.15**	-	-	**24.6**	-	-
YVD-16	YVD-030121-02	3/1/2021	N	119931	**290**	-	-	**290**	-	-	0.070	U	-	-	-	-	**90.0**	-	-	**42.9**	-	-	**0.20**	-	-	**32.10**	-	-	**24.3**	-	-
YVD-16	YVD-030121-04	3/1/2021	FD	119931	**288**	-	-	**288**	-	-	0.070	U	-	-	-	-	**91.5**	-	-	**42.9**	-	-	**0.20**	-	-	**32.65**	-	-	**24.7**	-	-
YVD-16	YVD-060621-03	6/6/2021	N	124053	**299**	-	-	**299**	-	-	0.070	U	-	-	-	-	**88.5**	-	-	**37.5**	-	-	**0.16**	-	-	**31.85**	-	-	**21.8**	-	-
YVD-16	YVD-121421-02	12/14/2021	N	K2114499	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**19.7**	J	HTQ, MS
YVD-16	YVD-121421-03	12/14/2021	FD	K2114499	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**20.1**	-	-
YVD-16	YVD-031522-17	3/15/2022	N	K2202727	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**21.4**	-	-
YVD-16	YVD-060622-16	6/6/2022	N	K2206160	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**21.0**	-	-
YVD-17	YVD-17-130919	09/19/2013	N	SWI0142	**213**	-	-	**215**	-	-	-	-	-	0.1	U	-	**72.7**	-	-	**3.1**	-	-	0.5	U	-	**35.8**	-	-	-	-	-
YVD-17	YVD-17-130924	09/24/2013	N	SWI0175	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.8**	-	-
YVD-17	YVD-17-131210	12/10/2013	N	SWL0055	**169**	-	-	**170**	-	-	-	-	-	0.02	UJ	MSD	**54.2**	-	-	**2.98**	-	-	0.5	U	-	**28.4**	-	-	**0.68**	-	-
YVD-17	YVD-17-140316	03/16/2014	N	SXC0081	**144**	-	-	**145**	-	-	-	-	-	**0.166**	-	-	**36.0**	-	-	**3.45**	-	-	**0.65**	-	-	**17.6**	-	-	**1.07**	-	-
YVD-17	YVD-17-140601	06/01/2014	N	SXF0008	**169**	-	-	**170**	-	-	-	-	-	0.1	U	-	**42.3**	-	-	**3.17**	-	-	0.5	U	-	**18.5**	-	-	**0.67**	-	-
YVD-17	YVD-17-140922	09/22/2014	N	SXI0148	**183**	-	-	**185**	-	-	-	-	-	0.1	U	-	**47.5**	-	-	**2.87**	-	-	0.5	U	-	**21.2**	-	-	**0.96**	-	-
YVD-17	YVD-17-141215	12/15/2014	N	SXL0103	**168**	-	-	**170**	-	-	-	-	-	0.1	U	-	**42.1**	-	-	**2.99**	J+	MSD	0.5	U	-	**17.8**	-	-	**0.66**	J	DUP
YVD-17	YVD-17-150316	03/16/2015	N	5904471	**130**	-	-	**130**	-	-	-	-	-	0.1	U	-	**33.0**	-	-	**3.5**	-	-	**0.5**	-	-	**17.0**	-	-	**1.1**	-	-
YVD-17	YVD-D1-150316	03/16/2015	FD	5904471	**130**	-	-	**130**	-	-	-	-	-	0.1	U	-	**33.0**	-	-	**3.5**	-	-	**0.51**	-	-	**17.0**	-	-	**1.2**	-	-
YVD-17	YVD-17-150617	06/17/2015	N	59010961	**160**	-	-	**160**	-	-	-	-	-	0.1	U	-	**41.0**	-	-	**3**	-	-	0.5	U	-	**18.0**	-	-	**0.59**	-	-
YVD-17	YVD-17-150924	09/24/2015	N	59020391	**170**	-	-	**170**	-	-	-	-	-	0.1	UJ	MSD	**40.0**	-	-	**3.1**	-	-	**0.6**	-	-	**18.0**	-	-	0.2	U	-
YVD-17	YVD-17-151216	12/16/2015	N	59025501	**180**	-	-	**180**	-	-	-	-	-	-	R	MSD	**38.0**	-	-	**2.6**	-	-	0.5	U	-	**17.0**	-	-	**0.55**	-	-
YVD-17	YVD-17-160310	03/10/2016	N	59029941	**150**	-	-	**150**	-	-	-	-	-	0.1	U	-	**35.0**	-	-	**2.8**	-	-	0.5	U	-	**16.0**	-	-	**0.32**	-	-
YVD-17	YVD-17-160623	6/23/2016	N	59037371	**170**	-	-	**170**	-	-	-	-	-	-	R	MSD	**39.0**	-	-	**3.4**	-	-	0.5	U	-	**18.0**	-	-	**0.55**	-	-
YVD-17	YVD-17-160926	9/26/2016	N	K1611565	**182**	-	-	**182**	-	-	-	-	-	0.050	U	MBK	**40.8**	-	-	**2.91**	-	-	**0.32**	-	-	**17.3**	-	-	**1.16**	-	-
YVD-17	YVD-17-161215	12/15/2016	N	K1615174	**154**	-	-	**157**	J	-	-	-	-	0.050	U	-	**39.6**	-	-	**2.42**	-	-	**0.34**	-	-	**15.8**	-	-	**0.59**	-	-
YVD-17	YVD-031017-29	3/10/2017	N	K1702448	**142**	-	-	**156**	J	-	-	-	-	0.050	U	-	**36.6**	-	-	**2.65**	-	-	**0.33**	-	-	**15.7**	-	-	**0.42**	-	-
YVD-17	YVD-060617-24	6/6/2017	N	K1705754	**167**	-	-	**167**	-	-	-	-	-	0.050	U	-	**40.2**	-	-	**2.40**	-	-	**0.35**	-	-	**15.8**	-	-	**0.50**	-	-
YVD-17	YVD-092517-08	9/25/2017	N	K1710274	**179**	-	-	**179**	-	-	-	-	-	0.050	U	-	**43.1**	-	-	**2.89**	-	-	**0.37**	-	-	**16.4**	-	-	**0.99**	-	-
YVD-17	YVD-120517-26	12/5/2017	N	K1713091	**187**	-	-	**187**	-	-	-	-	-	0.050	U	-	**43.6**	-	-	**2.71**	-	-	**0.39**	-	-	**15.4**	-	-	**0.71**	-	-
YVD-17	YVD-060418-20	6/4/2018	N	874662	**160**	-	-	**160**	-	-	0.09	U	FBK	-	-	-	**39.1**	-	-	**2.87**	-	-	**0.30**	-	-	**16.5**	-	-	**0.66**	-	-
YVD-17	YVD-060219-12	6/2/2019	N	991939	**149**	-	-	**149**	-	-	0.070	U	-	-	-	-	**35.0**	-	-	2.91	U	FBK	0.24	U	FBK	**15.15**	-	-	**0.49**	-	-

Table 8
Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3-G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-17	YVD-060820-10	6/8/2020	N	009144	**146**	-	-	**146**	-	-	0.070	U	-	-	-	-	**34.4**	-	-	**3.17**	-	-	**0.25**	-	-	**15.15**	-	-	0.7	-	-
YVD-17	YVD-060621-04	6/6/2021	N	124053	**144**	-	-	**144**	-	-	0.070	U	-	-	-	-	**33.3**	-	-	**2.36**	J	FDP	**0.19**	-	-	**14.55**	-	-	0.4	-	-
YVD-17	YVD-060621-05	6/6/2021	FD	124053	**144**	-	-	**144**	-	-	0.070	U	-	-	-	-	**33.5**	-	-	**2.99**	J	FDP	**0.24**	-	-	**14.70**	-	-	0.47	-	-
YVD-17	YVD-060622-14	6/6/2022	N	K2206160	**-**	-	-	**-**	-	-	-	-	-	-	-	-	**-**	-	-	**-**	-	-	**-**	-	-	**-**	-	-	0.61	-	-
YVD-18	YVD-18-130919	09/19/2013	N	SWI0142	**119**	-	-	**120**	-	-	-	-	-	0.1	U	-	**42.9**	-	-	**61.4**	-	-	5	U	-	**13.7**	-	-	-	-	-
YVD-18	YVD-18-130925	09/25/2013	N	SWI0175	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**13.6**	-	-
YVD-18	YVD-18-131211	12/11/2013	N	SWL0073	**109**	-	-	**110**	-	-	-	-	-	0.02	UJ	MSD	**50.4**	-	-	**62.9**	-	-	5	U	-	**17.1**	-	-	**14.2**	J	FDP
YVD-18	YVD-D2-131211	12/11/2013	FD	SWL0073	**114**	-	-	**115**	-	-	-	-	-	0.02	UJ	MSD	**50.2**	-	-	**66.5**	-	-	5	U	-	**16.7**	-	-	**23.5**	J	FDP
YVD-18	YVD-18-140318	03/18/2014	N	SXC0095	**119**	-	-	**120**	-	-	-	-	-	**0.134**	J	FDP	**51.7**	-	-	**66.7**	-	-	5	U	-	**16.5**	-	-	**18.8**	-	-
YVD-18	YVD-D2-140318	03/18/2014	FD	SXC0095	**124**	-	-	**125**	-	-	-	-	-	**0.28**	J	FDP	**52.0**	-	-	**62.1**	-	-	5	U	-	**16.6**	-	-	**17.1**	-	-
YVD-18	YVD-18-140603	06/03/2014	N	SXF0017	**117**	-	-	**118**	-	-	-	-	-	0.1	U	-	**46.8**	-	-	**64**	-	-	2	U	-	**15.4**	-	-	**16.9**	-	-
YVD-18	YVD-18-140923	09/23/2014	N	SXI0173	**114**	-	-	**115**	-	-	-	-	-	0.1	U	-	**48.5**	-	-	**54.7**	-	-	2.5	U	-	**15.6**	-	-	**13.8**	-	-
YVD-18	YVD-18-141216	12/16/2014	N	SXL0121	**114**	-	-	**115**	-	-	-	-	-	0.1	U	-	**52.7**	-	-	**59.6**	-	-	2.5	U	-	**17.7**	-	-	**16.5**	-	-
YVD-18	YVD-18-150317	03/17/2015	N	5904541	**110**	-	-	**110**	-	-	-	-	-	0.1	U	-	**56.0**	-	-	**64**	-	-	2.5	U	-	**19.0**	-	-	**20**	J-	MSD
YVD-18	YVD-18-150617	06/17/2015	N	59010961	**110**	-	-	**110**	-	-	-	-	-	0.1	U	-	**55.0**	-	-	**65**	-	-	2.5	U	-	**18.0**	-	-	**17**	-	-
YVD-18	YVD-18-150924	09/24/2015	N	59020391	**120**	-	-	**120**	-	-	-	-	-	0.1	UJ	MSD	**52.0**	-	-	**63**	-	-	2.5	U	-	**19.0**	-	-	**20**	J+	MSD
YVD-18	YVD-18-151216	12/16/2015	N	59025501	**120**	-	-	**120**	-	-	-	-	-	-	R	MSD	**60.0**	-	-	**66**	-	-	2.5	U	-	**20.0**	-	-	**23**	-	-
YVD-18	YVD-18-160309	03/09/2016	N	59029941	**120**	-	-	**120**	-	-	-	-	-	0.1	U	-	**62.0**	-	-	**63**	-	-	2.5	U	-	**21.0**	-	-	**22**	-	-
YVD-18	YVD-18-160622	6/22/2016	N	59037271	**130**	-	-	**130**	-	-	-	-	-	0.1	UJ	MSD	**55.0**	-	-	**61**	-	-	2.5	U	-	**19.0**	-	-	**21**	-	-
YVD-18	YVD-18-160928	9/28/2016	N	K1611629	**114**	-	-	**114**	-	-	-	-	-	0.050	U	MBK	**58.2**	-	-	**56.8**	-	-	**0.36**	-	-	**19.7**	-	-	**20.5**	-	-
YVD-18	YVD-18-161214	12/14/2016	N	K1615083	**111**	-	-	**111**	-	-	-	-	-	0.050	U	-	**62.5**	-	-	**56.3**	-	-	**0.38**	-	-	**19.6**	-	-	**21.5**	-	-
YVD-18	YVD-D3-161214	12/14/2016	FD	K1615083	**111**	-	-	**111**	-	-	-	-	-	**0.115**	-	-	**60.6**	-	-	**56.4**	-	-	**0.37**	-	-	**20.1**	-	-	**21.5**	-	-
YVD-18	YVD-030617-05	3/6/2017	N	K1702324	**110**	-	-	**110**	-	-	-	-	-	1	U	-	**65.4**	-	-	**55.9**	-	-	**0.40**	-	-	**20.5**	-	-	**23.7**	J	HTQ
YVD-18	YVD-060717-31	6/7/2017	N	K1705833	**114**	-	-	**114**	-	-	-	-	-	0.050	U	-	**65.2**	-	-	**57.0**	-	-	**0.34**	-	-	**21.4**	-	-	**22.9**	-	-
YVD-18	YVD-092617-27	9/26/2017	N	K1710333	**115**	-	-	**115**	-	-	-	-	-	0.050	U	-	**58.5**	-	-	**54.8**	-	-	**0.38**	-	-	**18.3**	-	-	**21.6**	-	-
YVD-18	YVD-120417-05	12/4/2017	N	K1713026	**114**	-	-	**114**	-	-	-	-	-	0.050	U	-	**62.6**	-	-	**58.9**	-	-	**0.40**	-	-	**20.0**	-	-	**24.4**	-	-
YVD-18	YVD-031918-17	3/19/2018	N	870634	**111**	-	-	**111**	-	-	0.070	U	-	-	-	-	**67.5**	-	-	**68.2**	-	-	**0.34**	-	-	**22.00**	-	-	**27.7**	-	-
YVD-18	YVD-060318-07	6/3/2018	N	874568	**110**	-	-	**110**	-	-	0.070	U	-	-	-	-	**70.0**	-	-	**65.9**	-	-	**0.33**	-	-	**23.30**	-	-	**26.3**	-	-
YVD-18	YVD-090918-12	9/9/2018	N	880601	**112**	-	-	**112**	-	-	0.070	U	-	-	-	-	**67.5**	-	-	**67.1**	-	-	**0.35**	-	-	**22.05**	-	-	**26.0**	-	-
YVD-18	YVD-121018-09	12/10/2018	N	884857	**115**	-	-	**115**	-	-	0.070	U	-	-	-	-	**68.0**	-	-	**66.8**	-	-	0.32	U	FBK	**22.00**	J	MSD	**27.0**	-	-
YVD-18	YVD-031819-13	3/18/2019	N	988273	**118**	-	-	**118**	-	-	0.070	U	-	-	-	-	**75.0**	-	-	**74.5**	-	-	**0.73**	-	-	**23.70**	-	-	**29.8**	-	-
YVD-18	YVD-060319-23	6/3/2019	N	992053	**118**	-	-	**118**	-	-	0.070	U	-	-	-	-	**75.0**	-	-	**71.0**	-	-	**0.25**	-	-	**23.35**	-	-	**28.4**	-	-
YVD-18	YVD-090919-06	9/9/2019	N	998357	**115**	-	-	**115**	-	-	0.070	U	-	-	-	-	**65.0**	-	-	**61.5**	-	-	**0.38**	-	-	**20.65**	-	-	**28.4**	-	-
YVD-18	YVD-090919-08	9/9/2019	FD	998357	**114**	-	-	**114**	-	-	0.070	U	-	-	-	-	**65.5**	-	-	**60.9**	-	-	**0.38**	-	-	**20.75**	-	-	**28.3**	-	-
YVD-18	YVD-120919-08	12/9/2019	N	902276	**113**			**113**			0.070	U		-	-	-	**70.0**			**68.1**			**0.34**			**22.95**			**28.8**		
YVD-18	YVD-033020-07	3/30/2020	N	006241	**117**	-	-	**117**	-	-	0.070	U	-	-	-	-	**73.5**	-	-	**71.6**	-	-	**0.30**	-	-	**23.30**	-	-	**28.5**	-	-
YVD-18	YVD-060920-19	6/9/2020	N	009269	**120**	-	-	**120**	-	-	0.070	U	-	-	-	-	**70.5**	-	-	**69.1**	-	-	**0.29**	-	-	**22.50**	-	-	**27.4**	-	-
YVD-18	YVD-092120-15	9/21/2020	N	013896	**115**	-	-	**115**	-	-	0.070	U	-	-	-	-	**67.0**	-	-	**70.9**	-	-	**0.31**	-	-	**21.55**	-	-	**27.4**	-	-
YVD-18	YVD-092120-17	9/21/2020	FD	013896	**113**	-	-	**113**	-	-	0.070	U	-	-	-	-	**65.5**	-	-	**70.4**	-	-	**0.31**	-	-	**21.15**	-	-	**27.2**	-	-
YVD-18	YVD-120820-15	12/8/2020	N	017137	**116**	-	-	**116**	-	-	0.070	U	-	-	-	-	**71.0**	-	-	**64.8**	-	-	**0.42**	-	-	**22.70**	-	-	**26.6**	-	-
YVD-18	YVD-030221-17	3/2/2021	N	120034	**122**	-	-	**122**	-	-	0.070	U	-	-	-	-	**76.0**	-	-	**72.2**	-	-	**0.31**	-	-	**23.70**	-	-	**28.2**	-	-
YVD-18	YVD-060821-30	6/8/2021	N	124212	**120**	-	-	**120**	-	-	0.070	U	-	-	-	-	**71.0**	-	-	**75.8**	-	-	**0.31**	-	-	**22.75**	-	-	**31.8**	-	-
YVD-18	YVD-121521-12	12/15/2021	N	K2114550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**26.6**	J	HTQ, MS
YVD-18	YVD-121521-14	12/15/2021	FD	K2114550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**26.7**	J	HTQ, MS
YVD-18	YVD-031522-18	3/15/2022	N	K2202727	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**30**	-	-
YVD-18	YVD-060722-25	6/7/2022	N	K2206237	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**30.9**	J	HTQ
YVD-18	YVD-060722-26	6/7/2022	FD	K2206237	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**30.5**	J	HTQ

Table 8
Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3-G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
Equipment Blank	YVD-EB-130918	09/18/2013	EB	SWI0123	4	U	-	4	U	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Equipment Blank	YVD-EB-130925	09/25/2013	EB	SWI0175	4	U	-	4	U	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Equipment Blank	YVD-EB-131212	12/12/2013	EB	SWL0078	4	U	-	4	U	-	0.02	U	-	0.02	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Equipment Blank	YVD-EB-140317	03/17/2014	EB	SXC0081	4	U	-	4	U	-	**0.124**	-	-	**0.124**	-	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Equipment Blank	YVD-EB-140318	03/18/2014	EB	SXC0095	4	U	-	4	U	-	**0.13**	-	-	**0.13**	-	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Equipment Blank	YVD-EB-140319	03/19/2014	EB	SXC0107	4	U	-	4	U	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Equipment Blank	YVD-EB-140604	06/04/2014	EB	SXF0025	4	U	-	4	U	-	0.1	U	-	0.1	U	-	1	U	-	**1.46**	-	-	0.5	U	-	0.5	U	-	0.2	U	-
Equipment Blank	YVD-EB-140924	09/24/2014	EB	SXI0173	4	U	-	4	U	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Equipment Blank	YVD-EB-141217	12/17/2014	EB	SXL0144	4	U	-	4	U	-	0.1	U	-	0.1	U	-	1	U	-	**0.9**	-	-	0.5	U	-	0.5	U	-	0.2	U	-
Equipment Blank	YVD-EB-150617	06/17/2015	EB	59011021	**5**	-	-	**5**	-	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Equipment Blank	YVD-EB-150925	09/25/2015	EB	59020431	4	U	-	4	U	-	**0.1**	-	-	**0.1**	-	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Equipment Blank	YVD-EB-151216	12/16/2015	EB	59025501	**5**	-	-	**5**	-	-	**0.12**	J-	MSD	**0.12**	J-	MSD	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Equipment Blank	YVD-EB-160310	03/10/2016	EB	59029941	**15**	-	-	**15**	-	-	0.1	U	-	0.1	U	-	1	U	-	**1.1**	-	-	**0.67**	-	-	0.5	U	-	0.2	U	-
Equipment Blank	YVD-EB-160623	6/23/2016	EB	59037371	**5**	-	-	**5**	-	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Equipment Blank	YVD-EB-160926	9/26/2016	EB	K1611506	2	U	-	2	U	-	0.050	U	MBK	0.050	U	MBK	**0.097**	-	-	0.2	U	-	0.2	U	-	**0.0346**	-	-	0.1	U	-
Equipment Blank	YVD-EB-160927	9/27/2016	EB	K1611629	2	U	-	2	U	-	0.050	U	MBK	0.050	U	MBK	**0.011**	J	-	0.1	U	-	0.1	U	-	**0.0004**	J	-	0.05	UJ	HTQ
Equipment Blank	YVD-EB-160928	9/28/2016	EB	K1611629	2	U	-	2	U	-	0.050	U	MBK	0.050	U	MBK	**0.05**	J	-	**0.03**	J	-	0.1	U	-	0.05	U	-	0.05	U	-
Equipment Blank	YVD-EB1-161214	12/14/2016	EB	K1615083	2	U	-	2	U	-	0.050	U	-	0.050	U	-	0.021	U	MBK	0.2	U	-	0.2	U	-	0.0053	U	MBK	0.1	U	-
Equipment Blank	YVD-EB2-161215	12/15/2016	EB	K1615126	2	U	-	2	U	-	0.050	U	-	0.050	U	-	0.021	U	MBK	0.2	U	-	0.2	U	-	0.0053	U	MBK	0.1	U	-
Equipment Blank	YVD-EB3-161216	12/16/2016	EB	K1615174	2	U	-	2	U	-	0.050	U	-	0.050	U	-	0.035	U	MBK	0.2	U	-	0.2	U	-	0.0053	U	MBK	0.1	U	-
Field Blank	YVD-F1-130916	09/16/2013	FB	SWI0113	4	U	-	4	U	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F2-130917	09/17/2013	FB	SWI0113	4	U	-	4	U	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F3-130918	09/18/2013	FB	SWI0123	4	U	-	4	U	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F4-130918	09/18/2013	FB	SWI0138	4	U	-	4	U	-	**0.12**	-	-	**0.12**	-	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F5-130919	09/19/2013	FB	SWI0142	4	U	-	4	U	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	-	-	-
Field Blank	YVD-F6-130923	09/23/2013	FB	SWI0178	4	U	-	4	U	-	0.1	U	-	0.1	U	-	1	U	-	-	-	-	-	-	-	0.5	U	-	-	-	-
Field Blank	YVD-F7-130924	09/24/2013	FB	SWI0175	4	U	-	4	U	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F7-130926	09/26/2013	FB	SWI0190	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8	U	-	0.5	U	-	-	-	-	0.2	U	-

Table 8
Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3-G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
Field Blank	YVD-F1-131209	12/09/2013	FB	SWL0055	4	U	-	4	U	-	0.02	U	-	0.02	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F2-131210	12/10/2013	FB	SWL0063	4	U	-	4	U	-	0.02	U	-	0.02	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F3-131211	12/11/2013	FB	SWL0073	4	U	-	4	U	-	0.02	U	-	0.02	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F4-131212	12/12/2013	FB	SWL0078	4	U	-	4	U	-	0.02	U	-	0.02	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F1-140316	03/16/2014	FB	SXC0081	4	U	-	4	U	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F2-140317	03/17/2014	FB	SXC0095	4	U	-	4	U	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F3-140318	03/18/2014	FB	SXC0107	4	U	-	4	U	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F4-140319	03/19/2014	FB	SXC0107	4	U	-	4	U	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F1-140601	06/01/2014	FB	SXF0008	**4.25**	-	-	**4.25**	-	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F2-140602	06/02/2014	FB	SXF0017	4	U	-	4	U	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F3-140603	06/03/2014	FB	SXF0025	4	U	-	4	U	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F1-140921	09/21/2014	FB	SXI0148	4	U	-	4	U	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F2-140922	09/22/2014	FB	SXI0148	4	U	-	4	U	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F3-140923	09/23/2014	FB	SXI0158	4	U	-	4	U	-	**0.128**	-	-	**0.128**	-	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F4-140924	09/24/2014	FB	SXI0173	4	U	-	4	U	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F1-141215	12/15/2014	FB	SXL0103	4	U	-	4	U	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	UJ	DUP
Field Blank	YVD-F2-141215	12/15/2014	FB	SXL0108	4	U	-	4	U	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F3-141216	12/16/2014	FB	SXL0121	4	U	-	4	U	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F4-141217	12/17/2014	FB	SXL0144	4	U	-	4	U	-	**0.101**	-	-	**0.101**	-	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	-	R	HTQ
Field Blank	YVD-F1-150315	03/15/2015	FB	5904471	**15**	-	-	**15**	-	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F2-150316	03/16/2015	FB	5904541	**7.5**	-	-	**7.5**	-	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F3-150317	03/17/2015	FB	5904651	**4.5**	-	-	**4.5**	-	-	0.1	U	-	0.1	U	-	**1.2**	-	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F1-150615	06/15/2015	FB	59010751	**10**	-	-	**10**	-	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F2-150616	06/16/2015	FB	59010961	**5**	-	-	**5**	-	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F3-150617	06/17/2015	FB	59011021	**5**	-	-	**5**	-	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F1-150922	09/22/2015	FB	59020141	4	U	-	4	U	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F2-150923	09/23/2015	FB	59020281	4	U	-	4	U	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F3-150923	09/23/2015	FB	59020391	4	U	-	4	U	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F4-150924	09/24/2015	FB	59020391	4	U	-	4	U	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F5-150925	09/25/2015	FB	59020431	4	U	-	4	U	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F1-151213	12/13/2015	FB	59025351	**5**	-	-	**5**	-	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F2-151214	12/14/2015	FB	59025431	**5**	-	-	**5**	-	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F3-151215	12/15/2015	FB	59025501	**5**	-	-	**5**	-	-	-	R	MSD	-	R	MSD	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F4-151216	12/16/2015	FB	59025501	**5**	-	-	**5**	-	-	-	R	MSD	-	R	MSD	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F1-160307	03/07/2016	FB	59029521	4	U	-	4	U	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F2-160308	03/08/2016	FB	59029711	4	U	-	4	U	-	**0.19**	-	-	**0.19**	-	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F3-160309	03/09/2016	FB	59029941	4	U	-	4	U	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F4-160310	03/10/2016	FB	59029941	**13**	-	-	**13**	-	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F1-160620	6/20/2016	FB	59037101	**5**	-	-	**5**	-	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F2-160621	6/21/2016	FB	59037151	4	U	-	4	U	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F3-160622	6/22/2016	FB	59037271	**5**	-	-	**5**	-	-	**0.22**	-	-	**0.22**	-	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-F4-160623	6/23/2016	FB	59037371	**10**	-	-	**10**	-	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Field Blank	YVD-FB-160926	9/26/2016	FB	K1611506	2	U	-	2	U	-	0.050	U	MBK	0.050	U	MBK	0.02	U	MBK	0.2	U	-	0.2	U	-	**0.0025**	J	-	0.1	U	-
Field Blank	YVD-FB-160927	9/27/2016	FB	K1611565	2	U	-	2	U	-	0.050	U	MBK	0.050	U	MBK	0.02	U	MBK	0.2	U	-	0.2	U	-	0.05	U	-	0.1	U	-
Field Blank	YVD-FB-160928	9/28/2016	FB	K1611629	15	U	-	15	U	-	0.050	U	MBK	0.050	U	MBK	**0.05**	J	-	0.1	U	-	0.1	U	-	0.05	U	-	0.05	U	-
Field Blank	YVD-FB-160929	9/29/2016	FB	K1611698	2	U	-	2	U	-	0.050	U	MBK	0.050	U	MBK	**0.07**	J	-	0.2	U	-	0.2	U	-	0.05	U	-	0.1	U	-
Field Blank	YVD-FB1-161212	12/12/2016	FB	K1615029	2	U	-	2	U	-	0.050	U	-	0.050	U	-	0.021	U	MBK	0.2	U	-	0.2	U	-	0.0053	U	MBK	0.1	U	HTQ
Field Blank	YVD-FB2-161213	12/13/2016	FB	K1615045	2	U	-	2	U	-	0.050	U	-	0.050	U	-	0.021	U	MBK	0.2	U	-	0.2	U	-	0.0053	U	MBK	0.1	U	-
Field Blank	YVD-FB3-161214	12/14/2016	FB	K1615083	2	U	-	2	U	-	0.050	U	-	0.050	U	-	0.021	U	MBK	0.2	U	-	0.2	U	-	0.0053	U	-	0.1	U	-

Table 8
Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3-G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
Field Blank	YVD-FB4-161215	12/15/2016	FB	K1615126	2	U	-	2	U	-	0.050	U	-	0.050	U	-	0.021	U	MBK	0.2	U	-	0.2	U	-	0.0053	U	MBK	0.1	U	-
Field Blank	YVD-FB5-161216	12/16/2016	FB	K1615174	2	U	-	2	U	-	0.050	U	-	0.050	U	-	0.021	U	MBK	0.2	U	-	0.2	U	-	0.0053	U	MBK	0.1	U	-
Field Blank	YVD-030617-01	3/6/2017	FB	K1702228	2	U	-	2	U	-	0.050	U	-	0.050	U	-	0.021	U	MBK	0.2	U	-	0.2	U	-	0.0053	U	MBK	0.1	U	-
Field Blank	YVD-030717-06	3/7/2017	FB	K1702324	2	U	-	2	U	-	1	U	-	1	U	-	0.021	U	MBK	0.2	U	-	0.2	U	-	0.0053	U	MBK	0.1	UJ	HTQ
Field Blank	YVD-030817-11	3/8/2017	FB	K1702324	2	U	-	2	U	-	1	U	-	1	U	-	0.021	U	MBK	0.2	U	-	0.2	U	-	0.0053	U	MBK	0.1	U	-
Field Blank	YVD-030917-17	3/9/2017	FB	K1702404	2	U	-	2	U	-	0.050	U	-	0.050	U	-	0.021	U	MBK	0.2	U	-	0.2	U	-	0.0053	U	MBK	0.1	U	-
Field Blank	YVD-031017-26	3/10/2017	FB	K1702448	2	U	-	2	U	-	0.050	U	-	0.050	U	-	0.021	U	MBK	0.2	U	-	0.2	U	-	0.0053	U	MBK	0.1	U	-
Field Blank	YVD-031317-30	3/13/2017	FB	K1702489	2	U	-	2	U	-	0.050	U	-	0.050	U	-	0.021	U	MBK	0.2	U	-	0.2	U	-	0.0053	U	MBK	0.1	U	-
Field Blank	YVD-060417-01	6/4/2017	FB	K1705702	2	U	-	2	U	-	0.050	U	-	0.050	U	-	0.025	U	MBK	21	U	-	0.2	U	-	0.0053	U	MBK	5.3	U	-
Field Blank	YVD-060517-07	6/5/2017	FB	K1705702	2	U	-	2	U	-	0.050	U	-	0.050	U	-	0.029	U	MBK	0.2	U	-	0.2	U	-	0.0053	U	MBK	0.1	U	-
Field Blank	YVD-060617-17	6/6/2017	FB	K1705754	2	U	-	2	U	-	0.050	U	-	0.050	U	-	0.021	U	MBK	0.2	U	-	0.2	U	-	0.0053	U	MBK	0.1	U	-
Field Blank	YVD-060717-28	6/7/2017	FB	K1705833	2	U	-	2	U	-	0.050	U	-	0.050	U	-	0.021	U	MBK	0.2	U	-	0.2	U	-	0.0053	U	MBK	0.1	U	-
Field Blank	YVD-092517-01	9/25/2017	FB	K1710274	2.0	U	-	2.0	U	-	0.050	U	-	0.050	U	-	0.021	U	MBK	0.20	U	-	0.20	U	-	**0.0018**	J	-	0.10	U	-
Field Blank	YVD-092617-16	9/26/2017	FB	K1710333	2.0	U	-	2.0	U	-	0.050	U	-	0.050	U	-	0.026	U	MBK	0.20	U	-	0.20	U	-	0.0076	U	MBK	0.10	U	-
Field Blank	YVD-120417-01	12/4/2017	FB	K1713026	15	U	MBK	15	U	-	0.050	U	-	0.050	U	-	0.021	U	MBK	0.20	U	-	0.20	U	-	0.0053	U	MBK	0.10	U	-
Field Blank	YVD-120517-32	12/5/2017	FB	K1713091	15	U	MBK	15	U	-	0.050	U	-	0.050	U	-	0.021	U	MBK	**0.42**	-	-	0.20	U	-	0.0053	U	MBK	0.10	U	HTQ
Field Blank	YVD-120617-25	12/6/2017	FB	K1713157	15	U	MBK	15	U	-	0.050	U	MBK	0.050	U	MBK	0.021	U	MBK	0.20	U	-	0.20	U	-	0.0053	U	MBK	0.10	U	-
Field Blank	YVD-031818-01	3/18/2018	FB	870610	5	U	-	5	U	-	0.07	U	-	-	-	-	0.4	U	-	0.1	U	-	0.1	U	-	0.06	U	-	0.05	U	-
Field Blank	YVD-031918-10	3/19/2018	FB	870634	5	U	-	5	U	-	0.07	U	-	-	-	-	0.4	U	-	0.1	U	-	0.1	U	-	0.06	U	-	0.05	U	-
Field Blank	YVD-060318-01	6/3/2018	FB	874568	5	U	-	5	U	-	**0.18**	-	-	-	-	-	0.4	U	-	0.1	U	-	0.1	U	-	0.06	U	-	0.05	U	-
Field Blank	YVD-060418-12	6/4/2018	FB	874568	5	U	-	5	U	-	**0.08**	-	-	-	-	-	0.4	U	-	0.1	U	-	0.1	U	-	0.06	U	-	0.05	U	-
Field Blank	YVD-060518-26	6/5/2018	FB	874860	5	U	-	5	U	-	0.07	U	-	-	-	-	0.4	U	-	0.1	U	-	0.1	U	-	0.06	U	-	0.05	U	-
Field Blank	YVD-061218-33	6/12/2018	FB	875438	5	U	-	5	U	-	0.07	U	-	-	-	-	0.4	U	-	0.1	U	-	0.1	U	-	0.06	U	-	0.05	U	-
Field Blank	YVD-090918-01	9/9/2018	FB	880601	5	U	-	5	U	-	0.07	U	-	-	-	-	0.4	U	-	0.1	U	-	0.1	U	-	0.06	U	-	0.05	U	-
Field Blank	YVD-121018-01	12/10/2018	FB	884857	5	U	-	5	U	-	0.07	U	-	-	-	-	0.4	U	-	**0.28**	-	-	**0.10**	-	-	0.06	UJ	MSD	0.05	U	-
Field Blank	YVD-121118-12	12/11/2018	FB	884939	5	U	-	5	U	-	0.07	U	-	-	-	-	0.4	U	-	**0.14**	-	-	0.1	U	-	0.06	U	-	0.05	U	-
Field Blank	YVD-031719-01	3/17/2019	FB	988239	5	U	-	5	U	-	0.07	U	-	-	-	-	0.4	U	-	**0.22**	-	-	0.12	U	-	0.06	U	-	0.05	U	-
Field Blank	YVD-031819-11	3/18/2019	FB	988273	5	U	-	5	U	-	0.07	U	-	-	-	-	0.4	U	-	0.1	U	-	0.1	U	-	0.06	U	-	0.05	U	-
Field Blank	YVD-032019-20	3/20/2019	FB	988477	5	U	-	5	U	-	0.07	U	-	-	-	-	0.4	U	-	0.1	U	-	0.1	U	-	0.06	U	-	0.05	U	-
Field Blank	YVD-060219-01	6/2/2019	FB	991939	5	U	-	5	U	-	0.07	U	-	-	-	-	0.4	U	-	**11.0**	-	-	**0.63**	-	-	0.06	U	-	0.05	U	-
Field Blank	YVD-060319-13	6/3/2019	FB	992053	5	U	-	5	U	-	0.07	U	-	-	-	-	0.4	U	-	**0.31**	-	-	0.1	U	-	0.06	U	-	**0.08**	-	-
Field Blank	YVD-060419-26	6/4/2019	FB	992242	5	U	-	5	U	-	0.07	U	-	-	-	-	0.4	U	-	0.1	U	-	0.1	U	-	0.06	U	-	0.05	U	-
Field Blank	YVD-090919-01	9/9/2019	FB	998357	5	U	-	5	U	-	0.07	U	-	-	-	-	0.4	U	-	0.1	U	-	0.1	U	-	0.06	U	-	0.05	U	-
Field Blank	YVD-090919-03	9/9/2019	FB	998357	NS	-	-	NS	-	-	0.07	U	-	-	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-
Field Blank	YVD-091019-15	9/10/2019	FB	998438	5	U	-	5	U	-	0.07	U	-	-	-	-	0.4	U	-	0.1	U	-	0.1	U	-	0.06	U	-	0.05	U	-
Field Blank	YVD-091019-17	9/10/2019	FB	998438	NS	-	-	NS	-	-	0.07	U	-	-	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-
Field Blank	YVD-120919-01	12/9/2019	FB	902276	5	U	-	5	U	-	0.07	U	-	-	-	-	0.4	U	-	0.1	U	-	0.1	U	-	0.06	U	-	0.05	U	-
Field Blank	YVD-120919-09	12/9/2019	FB	902276	NS	-	-	NS	-	-	0.07	U	-	-	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-
Field Blank	YVD-121019-16	12/10/2019	FB	902321	5	U	-	5	U	-	0.07	U	-	-	-	-	0.4	U	-	0.1	U	-	0.1	U	-	0.06	U	-	0.05	U	-
Field Blank	YVD-121019-18	12/10/2019	FB	902321	NS	-	-	NS	-	-	0.07	U	-	-	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-
Field Blank	YVD-033020-01	3/30/2020	FB	006241	5	U	-	5	U	-	0.07	U	-	-	-	-	0.4	U	-	0.1	U	-	0.1	U	-	0.06	U	-	0.05	U	-
Field Blank	YVD-033020-03	3/30/2020	FB	006241	NS	-	-	NS	-	-	0.07	U	-	-	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-
Field Blank	YVD-033120-13	3/31/2020	FB	006260	5	U	-	5	U	-	0.07	U	-	-	-	-	0.4	U	-	0.1	U	-	0.1	U	-	0.06	U	-	0.05	U	-
Field Blank	YVD-033120-15	3/31/2020	FB	006260	NS	-	-	NS	-	-	0.07	U	-	-	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-
Field Blank	YVD-060820-01	6/8/2020	FB	009144	5	U	-	5	U	-	0.07	U	-	-	-	-	0.4	U	-	0.1	U	-	0.1	U	-	0.06	U	-	0.05	U	-
Field Blank	YVD-060820-02	6/8/2020	FB	009144	NS	-	-	NS	-	-	0.07	U	-	-	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-
Field Blank	YVD-060920-11	6/9/2020	FB	009269	5	U	-	5	U	-	0.07	U	-	-	-	-	0.4	U	-	0.1	U	-	0.1	U	-	0.06	U	-	0.05	U	-
Field Blank	YVD-060920-13	6/9/2020	FB	009269	NS	-	-	NS	-	-	0.07	U	-	-	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-
Field Blank	YVD-061020-29	6/10/2020	FB	009361	5	U	-	5	U	-	0.07	U	-	-	-	-	0.4	U	-	0.1	U	-	0.1	U	-	0.06	U	-	0.05	U	-

Table 8
Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3-G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
Field Blank	YVD-061020-28	6/10/2020	FB	009361	NS	-	-	NS	-	-	0.07	U	-	-	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-
Field Blank	YVD-092020-01	9/20/2020	FB	013864	5	U	-	5	U	-	0.07	U	-	-	-	-	0.4	U	-	0.1	U	-	0.1	U	-	0.06	U	-	0.05	U	-
Field Blank	YVD-092020-02	9/20/2020	FB	013864	NS	-	-	NS	-	-	0.07	U	-	-	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-
Field Blank	YVD-092120-10	9/21/2020	FB	013896	5	U	-	5	U	-	0.07	U	-	-	-	-	0.4	U	-	0.1	U	-	0.1	U	-	0.06	U	-	0.05	U	-
Field Blank	YVD-092120-12	9/21/2020	FB	013896	NS	-	-	NS	-	-	0.07	U	-	-	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-
Field Blank	YVD-120720-01	12/7/2020	FB	017035	5	U	-	5	U	-	0.07	U	-	-	-	-	0.4	U	-	0.1	U	-	0.1	U	-	0.06	U	-	0.05	U	-
Field Blank	YVD-120720-03	12/7/2020	FB	017035	NS	-	-	NS	-	-	0.07	U	-	-	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-
Field Blank	YVD-120820-16	12/8/2020	FB	017137	5	U	-	5	U	-	0.07	U	-	-	-	-	0.4	U	-	0.1	U	-	0.1	U	-	0.06	U	-	0.05	U	-
Field Blank	YVD-120820-18	12/8/2020	FB	017137	NS	-	-	NS	-	-	0.07	U	-	-	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-
Field Blank	YVD-030121-01	3/1/2021	FB	119931	5	U	-	5	U	-	0.07	U	-	-	-	-	0.4	U	-	0.1	U	-	0.1	U	-	0.06	U	-	0.05	U	-
Field Blank	YVD-030121-03	3/1/2021	FB	119931	NS	-	-	NS	-	-	0.07	U	-	-	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-
Field Blank	YVD-030221-11	3/2/2021	FB	120034	5	U	-	5	U	-	0.07	U	-	-	-	-	0.4	U	-	0.1	U	-	0.1	U	-	0.06	U	-	0.05	U	-
Field Blank	YVD-030221-13	3/2/2021	FB	120034	NS	-	-	NS	-	-	0.07	U	-	-	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-
Field Blank	YVD-060621-01	6/6/2021	FB	124053	5.0	U	-	5.0	U	-	0.070	U	-	-	-	-	0.40	U	-	0.10	U	-	0.10	U	-	0.060	U	-	0.050	U	-
Field Blank	YVD-060621-02	6/6/2021	FB	124053	-	-	-	-	-	-	0.070	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Field Blank	YVD-060721-11	6/7/2021	FB	124105	5.0	U	-	5.0	U	-	0.070	U	-	-	-	-	0.40	U	-	0.10	U	-	0.10	U	-	0.060	U	-	0.050	U	-
Field Blank	YVD-060721-12	6/7/2021	FB	124105	-	-	-	-	-	-	0.070	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Field Blank	YVD-060821-20	6/8/2021	FB	124212	5.0	U	-	5.0	U	-	0.070	U	-	-	-	-	0.40	U	-	0.10	U	-	0.10	U	-	0.060	U	-	0.050	U	-
Field Blank	YVD-060821-21	6/8/2021	FB	124212	-	-	-	-	-	-	0.070	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Field Blank	YVD-121421-01	12/14/2021	FB	K2114499	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.10	U	-
Field Blank	YVD-121521-13	12/15/2021	FB	K2114550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.10	UJ	ERL
Field Blank	YVD-031422-01	3/14/2022	FB	K2202633	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.050	UJ	ERL
Field Blank	YVD-031522-09	3/15/2022	FB	K2202727	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.050	U	-
Field Blank	YVD-060522-01	6/5/2022	FB	K2206116	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.10	U	-
Field Blank	YVD-060622-13	6/6/2022	FB	K2206160	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.10	U	-
Field Blank	YVD-060722-23	6/7/2022	FB	K2206237	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.10	UJ	HTQ
Field Blank	YVD-060822-33	6/8/2022	FB	K2206299	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.25	U	-
Blank Check	WW-1	4/25/2016	BC	59032861	**110**	-	-	**110**	-	-	**0.33**	-	-	**0.33**	-	-	1.7	U	-	160	U	-	100	U	-	0.83	U	-	40	U	-
Blank Check	DW-1	4/25/2016	BC	59032861	4	U	-	4	U	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-
Blank Check	DI-1	4/25/2016	BC	59032861	4	U	-	4	U	-	0.1	U	-	0.1	U	-	1	U	-	0.8	U	-	0.5	U	-	0.5	U	-	0.2	U	-

Table 8
Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P-E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-01	DC-01-130104	01/04/2013	N	EPA01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DC-01	DC-01-130924	09/24/2013	N	SWI0178	0.2	U	-	0.25	U	-	-	-	-	-	-	-	**0.123**	-	-	-	-	-	**6.10**	-	-	**43.0**	-	-	**223**	-	-
DC-01	DC-01-131211	12/11/2013	N	SWL0063	2	U	-	0.2	U	-	-	-	-	-	-	-	-	-	-	**0.186**	-	-	**5.94**	-	-	**41.9**	-	-	**280**	J-	MSD
DC-01	DC-01-140318	03/18/2014	N	SXC0095	2	U	-	**0.304**	-	-	**0.079**	-	-	-	-	-	-	-	-	-	-	-	**5.93**	-	-	**40.2**	-	-	**250**	J-	MSD
DC-01	DC-01-140602	06/02/2014	N	SXF0017	0.8	U	-	**0.45**	-	-	**0.81**	-	-	-	-	-	-	-	-	-	-	-	**6.74**	-	-	**41.8**	-	-	**224**	J-	MSD
DC-01	DC-01-140923	09/23/2014	N	SXI0158	2	U	-	0.25	U	-	**0.12**	-	-	-	-	-	-	-	-	-	-	-	**6.02**	-	-	**44.3**	J+	MSD	**216**	-	-
DC-01	DC-01-141216	12/16/2014	N	SXL0121	2	U	-	0.25	UJ	MSD	0.1	U	-	-	-	-	-	-	-	-	-	-	**6.18**	-	-	**43.1**	-	-	**463**	-	-
DC-01	DC-01-150316	03/16/2015	N	5904471	2	U	-	0.25	UJ	MSD	0.25	UJ	MSD	-	-	-	-	-	-	-	-	-	**6.50**	-	-	**44.0**	-	-	**220**	-	-
DC-01	DC-01-150616	06/16/2015	N	59010751	2	U	-	0.25	UJ	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**6.20**	J+	MSD	**42.0**	J+	MSD	**200**	J-	MSD
DC-01	DC-01-150923	09/23/2015	N	59020281	2	U	-	-	R	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**6.00**	-	-	**43.0**	-	-	**200**	-	-
DC-01	YVD-D1-150923	09/23/2015	FD	59020281	0.2	U	-	-	R	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**6.10**	-	-	**43.0**	-	-	**210**	-	-
DC-01	DC-01-151214	12/14/2015	N	59025431	2	U	-	-	R	MSD	**0.3**	J	FDP	-	-	-	-	-	-	-	-	-	**6.80**	-	-	**48.0**	-	-	**220**	-	-
DC-01	DC-01-160308	03/08/2016	N	59029711	2	U	-	-	R	MSD	**0.26**	-	-	-	-	-	-	-	-	-	-	-	**6.20**	-	-	**42.0**	-	-	**210**	J+	MSD
DC-01	DC-01-160620	6/20/2016	N	59037101	2	U	-	0.25	UJ	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**6.50**	-	-	**46.0**	-	-	**220**	J-	MSD
DC-01	DC-01-160928	9/28/2016	N	K1611629	0.10	U	-	0.5	U	-	-	-	-	**0.009**	J	-	-	-	-	-	-	-	**5.76**	-	-	**41.6**	-	-	**193**	-	-
DC-01	DC-01-161212	12/12/2016	N	K1615045	0.10	UJ	HTQ	0.5	U	-	-	-	-	**0.040**	-	-	-	-	-	-	-	-	**5.52**	-	-	**40.4**	-	-	**191**	-	-
DC-01	YVD-030817-18	3/8/2017	N	K1702324	0.10	U	-	0.5	U	-	-	-	-	**0.008**	J	-	-	-	-	-	-	-	**5.13**	-	-	**37.4**	-	-	**175**	-	-
DC-01	YVD-060417-03	6/4/2017	N	K1705702	0.10	U	-	0.5	U	-	-	-	-	**0.010**	J	-	-	-	-	-	-	-	**5.22**	-	-	**37.4**	-	-	**203**	-	-
DC-01	YVD-060417-05	6/4/2017	FD	K1705702	0.10	U	-	0.5	U	-	-	-	-	**0.010**	J	-	-	-	-	-	-	-	**5.08**	-	-	**36.9**	-	-	**203**	-	-
DC-01	YVD-092517-13	9/25/2017	N	K1710333	0.10	U	-	0.5	U	-	-	-	-	0.010	U	-	-	-	-	-	-	-	**5.31**	-	-	**39.1**	-	-	**194**	-	-
DC-01	YVD-120617-31	12/6/2017	N	K1713157	0.10	U	-	0.5	U	-	-	-	-	**0.010**	-	-	-	-	-	-	-	-	**5.56**	-	-	**40.6**	-	-	**182**	-	-
DC-01	YVD-060418-19	6/4/2018	N	874662	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**5.80**	-	-	**42.4**	-	-	**171**	-	-
DC-01	YVD-060219-03	6/2/2019	N	991939	0.050	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**5.50**	-	-	**39.0**	-	-	**168**	-	-
DC-01	YVD-060820-07	6/8/2020	N	009144	0.050	U	-	0.5	UJ	MS	-	-	-	-	-	-	-	-	-	**0.16**	-	-	**5.80**	-	-	**40.7**	-	-	**164**	-	-
DC-01	YVD-060721-10	6/7/2021	N	124105	0.050	U	-	5.0	UJ	MS, RPD	-	-	-	-	-	-	-	-	-	0.070	U	-	**5.30**	-	-	**36.4**	-	-	**136**	-	-
DC-01	YVD-060622-15	6/6/2022	N	K2206160	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	-	-	**-**	-	-	**-**	-	-
DC-03	DC-03-130102	01/02/2013	N	EPA01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DC-03	DC-03-130918	09/18/2013	N	SWI0138	2	U	-	0.25	U	-	-	-	-	-	-	-	0.1	U	-	-	-	-	**2.73**	-	-	**173**	-	-	**176**	-	-
DC-03	DC-03-131212	12/12/2013	N	SWL0078	2	U	-	0.2	U	-	-	-	-	-	-	-	-	-	-	**0.221**	-	-	**3.29**	-	-	**172**	-	-	**176**	-	-
DC-03	YVD-D3-131212	12/12/2013	FD	SWL0078	2	U	-	0.8311	U	ERL	-	-	-	-	-	-	-	-	-	**0.244**	-	-	**3.53**	-	-	**181**	-	-	**160**	-	-
DC-03	DC-03-140319	03/19/2014	N	SXC0107	2	U	-	**0.938**	J-	MSD	**0.057**	-	-	-	-	-	-	-	-	-	-	-	**2.91**	-	-	**165**	-	-	**189**	J	FDP
DC-03	YVD-D3-140319	03/19/2014	FD	SXC0107	2	U	-	**0.718**	J-	MSD	**0.062**	-	-	-	-	-	-	-	-	-	-	-	**2.81**	-	-	**166**	-	-	**150**	J	FDP
DC-03	DC-03-140604	06/04/2014	N	SXF0025	4	U	-	0.25	UJ	MSD	**0.12**	-	-	-	-	-	-	-	-	-	-	-	**3.11**	-	-	**177**	-	-	**214**	-	-
DC-03	DC-03-140924	09/24/2014	N	SXI0173	2	U	-	**2.27**	J+	MSD	**0.073**	J+	FBK	-	-	-	-	-	-	-	-	-	**3.28**	-	-	**178**	-	-	**166**	-	-
DC-03	DC-03-141217	12/17/2014	N	SXL0144	4	U	-	-	R	MSD	0.1	UJ	MSD	-	-	-	-	-	-	-	-	-	**3.76**	-	-	**185**	-	-	**182**	-	-
DC-03	YVD-D4-141217	12/17/2014	FD	SXL0144	10	U	-	-	R	MSD	**0.13**	J-	MSD	-	-	-	-	-	-	-	-	-	**3.19**	-	-	**180**	-	-	**211**	-	-
DC-03	DC-03-150318	03/18/2015	N	5904651	2	U	-	**0.45**	J-	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**3.30**	J-	MSD	**180**	-	-	**160**	-	-
DC-03	YVD-D4-150318	03/18/2015	FD	5904651	1	U	-	**0.53**	J-	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**3.60**	J-	MSD	**180**	-	-	**160**	-	-
DC-03	DC-03-150617	06/17/2015	N	59011021	2	U	-	-	R	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**3.60**	J	RPD	**190**	J	RPD	**170**	-	-
DC-03	YVD-D4-150617	06/17/2015	FD	59011021	2	U	-	-	R	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**3.60**	J	RPD	**190**	J	RPD	**180**	-	-
DC-03	DC-03-150925	09/25/2015	N	59020431	4	U	-	0.25	U	-	0.25	U	-	-	-	-	-	-	-	-	-	-	**3.30**	-	-	**180**	-	-	**150**	-	-
DC-03	YVD-D4-150925	09/25/2015	FD	59020431	4	U	-	0.25	U	-	0.25	U	-	-	-	-	-	-	-	-	-	-	**3.20**	-	-	**180**	-	-	**160**	-	-
DC-03	DC-03-151216	12/16/2015	N	59025501	2	U	-	-	R	MSD	0.25	UJ	MSD	-	-	-	-	-	-	-	-	-	**3.50**	-	-	**160**	-	-	**130**	-	-
DC-03	YVD-D4-151216	12/16/2015	FD	59025501	1	U	-	-	R	MSD	0.25	UJ	MSD	-	-	-	-	-	-	-	-	-	**3.50**	-	-	**160**	-	-	**130**	-	-

Table 8
Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P-E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-03	DC-03-160310	03/10/2016	N	59029941	2	U	-	**0.94**	J-	FDP, MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**3.10**	-	-	**180**	-	-	**170**	J	DUP
DC-03	YVD-D4-160310	03/10/2016	FD	59029941	2	U	-	0.25	UJ	FDP, MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**3.00**	-	-	**180**	-	-	**180**	J	DUP
DC-03	DC-03-160623	6/23/2016	N	59037371	2	U	-	0.25	U	-	0.25	U	-	-	-	-	-	-	-	-	-	-	**3.50**	-	-	**190**	-	-	**160**	-	-
DC-03	YVD-D4-160623	6/23/2016	FD	59037371	1	U	-	0.25	U	-	0.25	U	-	-	-	-	-	-	-	-	-	-	**3.30**	-	-	**180**	-	-	**160**	-	-
DC-03	DC-03-160927	9/27/2016	N	K1611565	0.10	U	-	-	R	MSD	-	-	-	**0.006**	J	-	-	-	-	-	-	-	**2.85**	-	-	**182**	-	-	**139**	-	-
DC-03	DC-03-D2-160927	9/27/2016	FD	K1611565	0.10	U	-	-	R	MSD	-	-	-	0.010	U	-	-	-	-	-	-	-	**2.87**	-	-	**183**	-	-	**138**	-	-
DC-03	DC-03-161212	12/12/2016	N	K1615029	0.10	U	-	0.5	U	-	-	-	-	**0.199**	-	-	-	-	-	-	-	-	**3.05**	-	-	**167**	-	-	**112**	-	-
DC-03	YVD-030817-13	3/8/2017	N	K1702324	**0.12**	-	-	0.5	U	-	-	-	-	**0.006**	J	-	-	-	-	-	-	-	**2.58**	-	-	**159**	-	-	**104**	-	-
DC-03	YVD-060517-02	6/5/2017	N	K1705702	0.10	U	-	0.5	U	-	-	-	-	**0.022**	-	-	-	-	-	-	-	-	**2.49**	-	-	**157**	-	-	**147**	-	-
DC-03	YVD-060517-04	6/5/2017	FD	K1705702	0.10	U	-	0.5	U	-	-	-	-	**0.019**	-	-	-	-	-	-	-	-	**2.49**	-	-	**158**	-	-	**122**	-	-
DC-03	YVD-092617-22	9/26/2017	N	K1710333	0.10	U	-	0.5	U	-	-	-	-	**0.010**	J	-	-	-	-	-	-	-	**2.92**	-	-	**159**	-	-	**115**	-	-
DC-03	YVD-120417-10	12/4/2017	N	K1713026	0.10	U	-	0.5	U	-	-	-	-	0.017	U	MBK	-	-	-	-	-	-	**2.76**	-	-	**161**	-	-	**108**	-	-
DC-03	YVD-031818-04	3/18/2018	N	870610	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.01**	-	-	**180**	-	-	**111**	-	-
DC-03	YVD-060418-22	6/4/2018	N	874860	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.34**	-	-	**174**	-	-	**108**	-	-
DC-03	YVD-090918-17	9/9/2018	N	880601	0.050	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.82**	-	-	**160**	-	-	**136**	-	-
DC-03	YVD-121018-03	12/10/2018	N	884857	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.24**	-	-	**170**	-	-	**134**	-	-
DC-03	YVD-031819-19	3/18/2019	N	988273	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.19**	-	-	**178**	-	-	**148**	-	-
DC-03	YVD-060419-32	6/4/2019	N	992242	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.02**	-	-	**172**	-	-	**152**	-	-
DC-03	YVD-091019-23	9/10/2019	N	998438	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.06**	-	-	**159**	-	-	**154**	-	-
DC-03	YVD-121019-22	12/10/2019	N	902321	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.60**	-	-	**164**	-	-	**156**	-	-
DC-03	YVD-033120-22	3/31/2020	N	006260	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.14**	-	-	**168**	-	-	**146**	-	-
DC-03	YVD-060920-26	6/9/2020	N	009269	0.050	U	-	5.0	UJ	MS										0.070	U	-	**3.30**	-	-	**174**	-	-	**161**	-	-
DC-03	YVD-092120-21	9/21/2020	N	013896	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.06**	-	-	**160**	-	-	**166**	-	-
DC-03	YVD-120720-05	12/7/2020	N	017035	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.58**	-	-	**170**	-	-	**160**	-	-
DC-03	YVD-120720-07	12/7/2020	FD	017035	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.66**	-	-	**166**	-	-	**161**	-	-
DC-03	YVD-030221-23	3/2/2021	N	120034	0.050	U	-	5.0	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.22**	-	-	**166**	-	-	**154**	-	-
DC-03	YVD-060821-27	6/8/2021	N	124212	0.050	U	-	0.50	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.07**	-	-	**160**	-	-	**162**	-	-
DC-03	YVD-031522-10	3/15/2022	N	K2202727	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DC-03	YVD-031522-11	3/15/2022	FD	K2202727	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DC-03	YVD-060522-10	6/5/2022	N	K2206116	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DC-03D	DC-03D-130918	09/18/2013	N	SWI0138	2	U	-	**0.255**	-	-	-	-	-	-	-	-	0.1	U	-	-	-	-	**2.71**	-	-	**62.1**	-	-	**101**	-	-
DC-03D	DC-03D-131212	12/12/2013	N	SWL0073	2	U	-	0.2	UJ	MSD	-	-	-	-	-	-	-	-	-	0.06	U	-	**2.67**	-	-	**59.7**	-	-	**99.1**	-	-
DC-03D	DC-03D-140319	03/19/2014	N	SXC0107	2	U	-	**0.427**	J-	MSD	0.05	U	-	-	-	-	-	-	-	-	-	-	**2.67**	-	-	**57.5**	-	-	**106**	-	-
DC-03D	DC-03D-140603	06/03/2014	N	SXF0017	0.8	U	-	**0.468**	-	-	**0.074**	J+	FBK	-	-	-	-	-	-	-	-	-	**2.66**	-	-	**59.0**	-	-	**103**	J-	MSD
DC-03D	DC-03D-140923	09/23/2014	N	SXI0173	1	U	-	0.25	U	-	**0.098**	-	-	-	-	-	-	-	-	-	-	-	**3.40**	-	-	**67.8**	-	-	**89.4**	-	-
DC-03D	DC-03D-141217	12/17/2014	N	SXL0121	1	U	-	**0.282**	J-	MSD	0.1	U	-	-	-	-	-	-	-	-	-	-	**2.92**	-	-	**60.7**	-	-	**92.2**	-	-
DC-03D	DC-03D-150317	03/17/2015	N	5904651	1	U	-	0.25	UJ	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**3.00**	J-	MSD	**68.0**	-	-	**87**	-	-
DC-03D	DC-03D-150617	06/17/2015	N	59011021	1	U	-	-	R	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**3.20**	J	RPD	**68.0**	J	RPD	**93**	-	-
DC-03D	DC-03D-150925	09/25/2015	N	59020431	4	U	-	0.25	U	-	0.25	U	-	-	-	-	-	-	-	-	-	-	**3.00**	-	-	**65.0**	-	-	**86**	-	-
DC-03D	DC-03D-151216	12/16/2015	N	59025501	1	U	-	-	R	MSD	0.25	UJ	MSD	-	-	-	-	-	-	-	-	-	**3.20**	-	-	**69.0**	-	-	**94**	-	-
DC-03D	DC-03D-160310	03/10/2016	N	59029941	1	U	-	0.25	UJ	FDP, MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**3.00**	-	-	**68.0**	-	-	**90**	J	DUP
DC-03D	DC-03D-160623	6/23/2016	N	59037371	2	U	-	0.25	U	-	0.25	U	-	-	-	-	-	-	-	-	-	-	**3.00**	-	-	**70.0**	-	-	**89**	-	-
DC-03D	DC-03D-160927	9/27/2016	N	K1611565	0.10	U	-	-	R	MSD	-	-	-	**0.006**	J	-	-	-	-	-	-	-	**2.73**	-	-	**63.0**	-	-	**90.9**	-	-
DC-03D	DC-03D-161212	12/12/2016	N	K1615029	0.10	U	-	0.5	U	-	-	-	-	**0.085**	-	-	-	-	-	-	-	-	**2.98**	-	-	**65.0**	-	-	**90.7**	-	-
DC-03D	YVD-030817-14	3/8/2017	N	K1702324	**0.05**	J	-	0.5	U	-	-	-	-	**0.008**	J	-	-	-	-	-	-	-	**2.75**	-	-	**61.3**	-	-	**80.8**	-	-

Table 8
Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P-E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-03D	YVD-030817-16	3/8/2017	FD	K1702324	**0.04**	J	-	0.5	U	-	-	-	-	**0.008**	J	-	-	-	-	-	-	-	**2.69**	-	-	**60.2**	-	-	**79.6**	-	-
DC-03D	YVD-060517-09	6/5/2017	N	K1705702	0.10	U	-	0.5	U	-	-	-	-	**0.006**	J	-	-	-	-	-	-	-	**2.66**	-	-	**59.7**	-	-	**91.6**	-	-
DC-03D	YVD-092617-24	9/26/2017	N	K1710333	0.10	U	-	-	R	MSD	-	-	-	**0.011**	-	-	-	-	-	-	-	-	**3.16**	-	-	**67.1**	-	-	**101**	-	-
DC-03D	YVD-120417-08	12/4/2017	N	K1713026	0.10	U	-	0.5	U	-	-	-	-	0.011	U	MBK	-	-	-	-	-	-	**2.64**	-	-	**60.9**	-	-	**86.7**	-	-
DC-03D	YVD-031818-02	3/18/2018	N	870610	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.02**	-	-	**70.0**	-	-	**86.1**	-	-
DC-03D	YVD-060418-24	6/4/2018	N	874860	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.24**	-	-	**67.0**	-	-	**82.1**	-	-
DC-03D	YVD-090918-15	9/9/2018	N	880601	0.050	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.01**	-	-	**68.0**	-	-	**88.6**	-	-
DC-03D	YVD-121018-05	12/10/2018	N	884857	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.18**	-	-	**67.0**	-	-	**83.0**	-	-
DC-03D	YVD-031819-17	3/18/2019	N	988273	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.16**	-	-	**66.5**	-	-	**82.0**	-	-
DC-03D	YVD-060419-30	6/4/2019	N	992242	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.94**	-	-	**65.5**	-	-	**81.8**	-	-
DC-03D	YVD-060419-31	6/4/2019	FD	992242	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.96**	-	-	**66.0**	-	-	**82.6**	-	-
DC-03D	YVD-091019-21	9/10/2019	N	998438	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.99**	-	-	**65.0**	-	-	**81.7**	-	-
DC-03D	YVD-091019-22	9/10/2019	FD	998438	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.98**	-	-	**65.0**	-	-	**81.7**	-	-
DC-03D	YVD-121019-20	12/10/2019	N	902321	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.18**	-	-	**61.5**	-	-	**80.9**	-	-
DC-03D	YVD-033120-20	3/31/2020	N	006260	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.92**	-	-	**64.0**	-	-	**74.5**	-	-
DC-03D	YVD-061020-34	6/10/2020	N	009361	0.050	U	-	0.5	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.85**	-	-	**62.5**	-	-	**75.0**	-	-
DC-03D	YVD-092120-19	9/21/2020	N	013896	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.96**	-	-	**65.0**	-	-	**82.4**	-	-
DC-03D	YVD-120720-09	12/7/2020	N	017035	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.31**	-	-	**63.5**	-	-	**77.0**	-	-
DC-03D	YVD-030221-21	3/2/2021	N	120034	0.050	U	-	5.0	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.96**	-	-	**63.5**	-	-	**80.6**	-	-
DC-03D	YVD-030221-21	3/2/2021	N	120034	0.050	U	-	5.0	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.96**	-	-	**63.5**	-	-	**80.6**	-	-
DC-03D	YVD-060821-29	6/8/2021	N	124212	0.050	U	-	0.50	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.04**	-	-	**63.5**	-	-	**83.7**	-	-
DC-03D	YVD-060821-31	6/8/2021	FD	124212	0.050	U	-	0.50	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.98**	-	-	**62.5**	-	-	**81.0**	-	-
DC-03D	YVD-121421-10	12/14/2021	N	K2114499	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DC-03D	YVD-031422-08	3/14/2022	N	K2202633	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DC-03D	YVD-060522-11	6/5/2022	N	K2206116	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DC-04	DC-04-130103	01/03/2013	N	EPA01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DC-04	DC-04-130920	09/20/2013	N	SWI0142	-	-	-	**3.03**	-	-	-	-	-	-	-	-	0.1	U	-	-	-	-	**3.45**	-	-	**32.1**	-	-	**93.6**	-	-
DC-04	DC-04-130924	09/24/2013	N	SWI0175	2	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DC-04	DC-04-131212	12/12/2013	N	SWL0073	2	U	-	0.2	UJ	MSD	-	-	-	-	-	-	-	-	-	**0.104**	-	-	**3.51**	-	-	**31.7**	-	-	**110**	-	-
DC-04	DC-04-140318	03/18/2014	N	SXC0107	2	U	-	**0.707**	J-	MSD	**0.13**	-	-	-	-	-	-	-	-	-	-	-	**3.58**	-	-	**30.4**	-	-	**107**	-	-
DC-04	DC-04-140603	06/03/2014	N	SXF0017	0.8	U	-	**0.645**	-	-	**0.24**	J+	FBK	-	-	-	-	-	-	-	-	-	**3.65**	-	-	**32.3**	-	-	**104**	J-	MSD
DC-04	DC-04-140923	09/23/2014	N	SXI0173	1	U	-	**0.524**	J+	MSD	**0.29**	-	-	-	-	-	-	-	-	-	-	-	**4.51**	-	-	**35.5**	-	-	**108**	-	-
DC-04	DC-04-141217	12/17/2014	N	SXL0121	1	U	-	0.25	UJ	MSD	**0.17**	-	-	-	-	-	-	-	-	-	-	-	**4.34**	-	-	**34.9**	-	-	**120**	-	-
DC-04	DC-04-150317	03/17/2015	N	5904651	1	U	-	**0.33**	J-	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**3.90**	J-	MSD	**36.0**	-	-	**110**	-	-
DC-04	DC-04-150617	06/17/2015	N	59010961	2	U	-	0.25	UJ	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**4.10**	J+	MSD	**36.0**	J+	MSD	**110**	-	-
DC-04	DC-04-150924	09/24/2015	N	59020391	1	U	-	**0.25**	J-	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**3.90**	-	-	**33.0**	-	-	**140**	J-	MSD
DC-04	YVD-D3-150924	09/24/2015	FD	59020391	1	U	-	0.25	UJ	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**4.10**	-	-	**35.0**	-	-	**150**	J-	MSD
DC-04	DC-04-151215	12/15/2015	N	59025431	1	U	-	-	R	MSD	0.25	UJ	FDP	-	-	-	-	-	-	-	-	-	**4.20**	-	-	**36.0**	-	-	**130**	-	-
DC-04	DC-04-160309	03/09/2016	N	59029711	1	U	-	-	R	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**4.00**	-	-	**36.0**	-	-	**150**	J+	MSD
DC-04	DC-04-160621	6/21/2016	N	59037271	1	U	-	-	R	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**4.40**	-	-	**39.0**	-	-	**150**	-	-
DC-04	DC-04-160926	9/26/2016	N	K1611506	0.10	U	-	-	R	MSD	-	-	-	**0.137**	-	-	-	-	-	-	-	-	**4.50**	-	-	**38.2**	-	-	**142**	-	-
DC-04	DC-04-161216	12/12/2016	N	K1615174	0.10	U	-	0.5	U	-	-	-	-	**0.052**	-	-	-	-	-	-	-	-	**4.11**	-	-	**36.9**	-	-	**155**	-	-
DC-04	YVD-031017-31	3/10/2017	N	K1702448	0.10	U	-	0.5	U	-	-	-	-	**0.035**	J	FDP	-	-	-	-	-	-	**3.75**	-	-	**32.4**	-	-	**153**	-	-
DC-04	YVD-031017-33	3/10/2017	FD	K1702448	0.10	U	-	0.5	U	-	-	-	-	**0.053**	J	FDP	-	-	-	-	-	-	**3.74**	-	-	**32.3**	-	-	**152**	-	-
DC-04	YVD-060617-26	6/6/2017	N	K1705833	0.10	U	-	0.5	U	-	-	-	-	**0.085**	-	-	-	-	-	-	-	-	**3.96**	-	-	**34.7**	-	-	**129**	-	-
DC-04	YVD-092517-06	9/25/2017	N	K1710274	0.10	U	-	0.5	U	-	-	-	-	**0.044**	-	-	-	-	-	-	-	-	**4.06**	-	-	**35.9**	-	-	**140**	-	-
DC-04	YVD-120517-24	12/5/2017	N	K1713091	0.10	U	-	0.5	UJ	MSD	-	-	-	**0.037**	-	-	-	-	-	-	-	-	**3.62**	-	-	**32.7**	-	-	**121**	-	-
DC-04	YVD-031818-07	3/18/2018	N	870610	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.02**	-	-	**35.6**	-	-	**115**	-	-

Table 8
Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P-E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-04	YVD-060418-18	6/4/2018	N	874662	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.18**	-	-	**34.4**	-	-	**119**	-	-
DC-04	YVD-090918-18	9/9/2018	N	880601	0.050	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.98**	-	-	**32.8**	-	-	**109**	-	-
DC-04	YVD-121118-18	12/11/2018	N	884939	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.08**	-	-	**32.0**	-	-	**102**	-	-
DC-04	YVD-032019-21	3/20/2019	N	988477	0.050	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.93**	-	-	**32.2**	-	-	**100**	-	-
DC-04	YVD-060219-14	6/2/2019	N	991939	0.050	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.00**	-	-	**32.2**	-	-	**103**	-	-
DC-04	YVD-090919-09	9/9/2019	N	998357	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.98**	-	-	**31.6**	-	-	**102**	-	-
DC-04	YVD-120919-07	12/9/2019	N	902276	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.20**	-	-	**32.2**	J	MSD	**101**	-	-
DC-04	YVD-033120-18	3/31/2020	N	006260	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.04**	-	-	**32.8**	-	-	**101**	-	-
DC-04	YVD-060820-08	6/8/2020	N	009144	0.050	U	-	0.5	UJ	MS	-	-	-	-	-	-	-	-	-	**0.07**	-	-	**4.14**	-	-	**33.8**	-	-	**102**	-	-
DC-04	YVD-092020-07	9/20/2020	N	013864	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.22**	-	-	**34.6**	-	-	**108**	-	-
DC-04	YVD-120820-23	12/8/2020	N	017137	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.32**	-	-	**35.2**	-	-	**121**	-	-
DC-04	YVD-030221-20	3/2/2021	N	120034	0.050	U	-	5.0	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.40**	-	-	**34.7**	-	-	**112**	-	-
DC-04	YVD-030221-22	3/2/2021	FD	120034	0.050	U	-	5.0	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.22**	-	-	**34.3**	-	-	**111**	-	-
DC-04	YVD-030221-20	3/2/2021	N	120034	0.050	U	-	5.0	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.40**	-	-	**34.7**	-	-	**112**	-	-
DC-04	YVD-030221-22	3/2/2021	FD	120034	0.050	U	-	5.0	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.22**	-	-	**34.3**	-	-	**111**	-	-
DC-04	YVD-060621-06	6/6/2021	N	124053	0.050	U	-	5.0	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.22**	-	-	**33.2**	-	-	**109**	-	-
DC-04	YVD-121521-21	12/15/2021	N	K2114550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DC-04	YVD-031522-15	3/15/2022	N	K2202727	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DC-04	YVD-060522-05	6/5/2022	N	K2206116	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DC-05	DC-05-130104	01/04/2013	N	EPA01	-		-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-
DC-05	DC-05-130920	09/20/2013	N	SWI0142	-		-	0.25	U	-	-	-	-	-	-	-	0.1	U	-	-	-	-	**2.88**		-	**64.2**		-	**154**		-
DC-05	DC-05-130924	09/24/2013	N	SWI0175	2	U	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-		-
DC-05	DC-05-131212	12/12/2013	N	SWL0073	2	U	-	0.2	UJ	MSD	-	-	-	-	-	-	-	-	-	**0.723**	-	-	**3.92**	-	-	**64.2**	-	-	**178**	-	-
DC-05	DC-05-140318	03/18/2014	N	SXC0107	2	U	-	**0.558**	J-	MSD	**0.06**	-	-	-	-	-	-	-	-	-	-	-	**2.90**	-	-	**59.4**	-	-	**150**	-	-
DC-05	DC-05-140603	06/03/2014	N	SXF0017	0.8	U	-	**0.581**	-	-	**0.28**	J+	FBK	-	-	-	-	-	-	-	-	-	**3.25**	-	-	**61.3**	-	-	**128**	J-	MSD
DC-05	DC-05-140923	09/23/2014	N	SXI0173	1	U	-	**0.998**	J+	MSD	**0.16**	-	-	-	-	-	-	-	-	-	-	-	**3.86**	-	-	**71.0**	-	-	**122**	-	-
DC-05	DC-05-141217	12/17/2014	N	SXL0121	1	U	-	0.25	UJ	MSD	**0.13**	-	-	-	-	-	-	-	-	-	-	-	**3.41**	-	-	**59.0**	-	-	**141**	-	-
DC-05	DC-05-150317	03/17/2015	N	5904541	0.8	U	-	**0.27**	J-	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**3.00**	-	-	**61.0**	-	-	**140**	J-	MSD
DC-05	DC-05-150616	06/16/2015	N	59010961	0.8	U	-	0.25	UJ	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**3.00**	J+	MSD	**64.0**	J+	MSD	**120**	-	-
DC-05	YVD-D2-150616	06/16/2015	FD	59010961	2	U	-	0.25	UJ	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**3.30**	J+	MSD	**64.0**	J+	MSD	**110**	-	-
DC-05	DC-05-150923	09/23/2015	N	59020391	0.8	U	-	0.25	UJ	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**3.10**	-	-	**56.0**	-	-	**110**	J-	MSD
DC-05	DC-05-151215	12/15/2015	N	59025431	0.8	U	-	-	R	MSD	0.25	UJ	FDP	-	-	-	-	-	-	-	-	-	**2.90**	-	-	**51.0**	-	-	**120**	-	-
DC-05	DC-05-160309	03/09/2016	N	59029711	0.8	U	-	-	R	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**2.90**	-	-	**53.0**	-	-	**140**	J+	MSD
DC-05	DC-05-160621	6/21/2016	N	59037151	0.8	U	-	0.25	U	-	0.25	U	-	-	-	-	-	-	-	-	-	-	**2.80**	-	-	**53.0**	-	-	**130**	-	-
DC-05	DC-05-160926	9/26/2016	N	K1611506	0.10	U	-	-	R	MSD	-	-	-	**0.031**	-	-	-	-	-	-	-	-	**2.89**	-	-	**54.9**	-	-	**114**	-	-
DC-05	DC-05-D1-160926	9/26/2016	FD	K1611506	0.10	U	-	-	R	MSD	-	-	-	**0.028**	-	-	-	-	-	-	-	-	**3.06**	-	-	**58.1**	-	-	**114**	-	-
DC-05	DC-05-161216	12/16/2016	N	K1615174	0.10	U	-	0.5	U	-	-	-	-	**0.048**	-	-	-	-	-	-	-	-	**2.60**	-	-	**47.9**	-	-	**108**	-	-
DC-05	YVD-D5-161216	12/16/2016	FD	K1615174	0.10	U	-	0.5	U	-	-	-	-	**0.04**	-	-	-	-	-	-	-	-	**2.65**	-	-	**49.6**	-	-	**107**	-	-
DC-05	YVD-030717-09	3/7/2017	N	K1702324	0.10	U	-	0.5	U	-	-	-	-	**0.026**	-	-	-	-	-	-	-	-	**2.61**	-	-	**58.3**	-	-	**97.6**	-	-
DC-05	YVD-060717-30	6/7/2017	N	K1705833	0.10	U	-	0.5	U	-	-	-	-	**0.059**	J	FDP	-	-	-	-	-	-	**2.82**	-	-	**63.9**	-	-	**102**	-	-
DC-05	YVD-060717-32	6/7/2017	FD	K1705833	0.10	U	-	0.5	U	-	-	-	-	**0.031**	J	FDP	-	-	-	-	-	-	**2.77**	-	-	**62.6**	-	-	**102**	-	-
DC-05	YVD-092517-04	9/25/2017	N	K1710274	0.10	U	-	0.5	U	-	-	-	-	**0.039**	-	-	-	-	-	-	-	-	**2.99**	-	-	**62.0**	-	-	**107**	-	-
DC-05	YVD-120517-16	12/5/2017	N	K1713091	0.10	U	-	0.5	UJ	MSD	-	-	-	**0.014**	-	-	-	-	-	-	-	-	**2.52**	-	-	**59.1**	-	-	**88.8**	-	-
DC-05	YVD-120517-18	12/5/2017	FD	K1713091	0.10	U	-	0.5	UJ	MSD	-	-	-	**0.014**	-	-	-	-	-	-	-	-	**2.53**	-	-	**60.0**	-	-	**89.3**	-	-
DC-05	YVD-031818-03	3/18/2018	N	870610	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.94**	-	-	**75.0**	-	-	**97.4**	-	-
DC-05	YVD-031818-05	3/18/2018	FD	870610	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.94**	-	-	**75.0**	-	-	**96.7**	-	-
DC-05	YVD-060318-02	6/3/2018	FD	874568	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.02**	-	-	**72.0**	-	-	**88.3**	-	-
DC-05	YVD-090918-03	9/9/2018	N	880601	0.050	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.91**	-	-	**65.5**	-	-	**95.4**	-	-

Table 8
Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P-E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-05	YVD-121118-16	12/11/2018	N	884939	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.05**	-	-	**68.1**	-	-	**92.2**	-	-
DC-05	YVD-031719-02	3/17/2019	N	988239	0.050	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.10**	-	-	**68.5**	-	-	**117**	-	-
DC-05	YVD-060219-08	6/2/2019	N	991939	0.050	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.14**	-	-	**71.0**	-	-	**122**	-	-
DC-05	YVD-090919-14	9/9/2019	N	998357	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.02**	-	-	**65.5**	-	-	**129**	-	-
DC-05	YVD-120919-03	12/9/2019	N	902276	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.12**	-	-	**72.5**	J	MSD	**110**	-	-
DC-05	YVD-033020-12	3/30/2020	N	006241	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.20**	-	-	**76.0**	-	-	**142**	-	-
DC-05	YVD-060820-06	6/8/2020	N	009144	0.050	U	-	0.5	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.26**	-	-	**76.0**	-	-	**114**	-	-
DC-05	YVD-092020-03	9/20/2020	N	013864	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.18**	-	-	**72.0**	-	-	**149**	-	-
DC-05	YVD-120720-06	12/7/2020	N	017035	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.42**	-	-	**65.0**	-	-	**166**	-	-
DC-05	YVD-030221-16	3/2/2021	N	120034	0.050	U	-	5.0	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.24**	-	-	**60.0**	-	-	**143**	-	-
DC-05	YVD-060721-14	6/7/2021	N	124105	0.050	U	-	5.0	UJ	MS, RPD	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.26**	-	-	**52.0**	-	-	**102**	-	-
DC-05	YVD-121521-15	12/15/2021	N	K2114550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DC-05	YVD-031422-04	3/14/2022	N	K2202633	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DC-05	YVD-060522-02	6/5/2022	N	K2206116	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DC-05	YVD-060522-03	6/5/2022	FD	K2206116	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DC-05D	DC-05D-130920	09/20/2013	N	SWI0142	-	-	-	**0.361**	-	-	-	-	-	-	-	-	**0.163**	-	-	-	-	-	**3.67**	-	-	**40.5**	-	-	**167**	-	-
DC-05D	DC-05D-130924	09/24/2013	N	SWI0178	0.2	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DC-05D	DC-05D-131211	12/11/2013	N	SWL0073	2	U	-	0.2	UJ	MSD	-	-	-	-	-	-	-	-	-	0.06	U	-	**3.52**	-	-	**37.5**	-	-	**145**	-	-
DC-05D	DC-05D-140318	03/18/2014	N	SXC0095	2	U	-	0.25	U	-	**0.072**	-	-	-	-	-	-	-	-	-	-	-	**3.73**	-	-	**36.7**	-	-	**137**	J-	MSD
DC-05D	DC-05D-140602	06/02/2014	N	SXF0017	0.8	U	-	**0.591**	-	-	**0.56**	J+	FBK	-	-	-	-	-	-	-	-	-	**4.99**	-	-	**34.3**	-	-	**122**	J-	MSD
DC-05D	DC-05D-140922	09/22/2014	N	SXI0148	0.8	U	-	**0.424**	-	-	**0.057**	-	-	-	-	-	-	-	-	-	-	-	**3.56**	-	-	**37.8**	-	-	**127**	-	-
DC-05D	DC-05D-141216	12/16/2014	N	SXL0121	0.2	U	-	0.25	UJ	MSD	**0.39**	-	-	-	-	-	-	-	-	-	-	-	**5.18**	-	-	**36.8**	-	-	**140**	-	-
DC-05D	DC-05D-150317	03/17/2015	N	5904541	0.8	U	-	0.25	UJ	MSD	**0.3**	-	-	-	-	-	-	-	-	-	-	-	**4.60**	-	-	**39.0**	-	-	**120**	J-	MSD
DC-05D	DC-05D-150616	06/16/2015	N	59010961	0.8	U	-	0.25	UJ	MSD	**0.27**	-	-	-	-	-	-	-	-	-	-	-	**4.70**	J+	MSD	**41.0**	J+	MSD	**120**	-	-
DC-05D	DC-05D-150923	09/23/2015	N	59020391	0.8	U	-	0.25	UJ	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**4.40**	-	-	**38.0**	-	-	**120**	J-	MSD
DC-05D	YVD-D2-150923	09/23/2015	FD	59020391	0.2	U	-	0.25	UJ	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**4.40**	-	-	**38.0**	-	-	**120**	J-	MSD
DC-05D	DC-05D-151215	12/15/2015	N	59025431	0.8	U	-	-	R	MSD	0.25	UJ	FDP	-	-	-	-	-	-	-	-	-	**4.40**	-	-	**39.0**	-	-	**120**	-	-
DC-05D	DC-05D-160309	03/09/2016	N	59029711	0.8	U	-	-	R	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**4.30**	-	-	**41.0**	-	-	**140**	J+	MSD
DC-05D	DC-05D-160621	6/21/2016	N	59037271	0.8	U	-	-	R	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**4.10**	-	-	**41.0**	-	-	**130**	-	-
DC-05D	DC-05D-160926	9/26/2016	N	K1611506	0.10	U	-	-	R	MSD	-	-	-	**0.014**	-	-	-	-	-	-	-	-	**3.93**	-	-	**39.4**	J	MSD	**113**	-	-
DC-05D	DC-05D-161214	12/14/2016	N	K1615126	0.10	U	-	0.5	U	-	-	-	-	**0.015**	-	-	-	-	-	-	-	-	**3.90**	-	-	**38.2**	-	-	**114**	-	-
DC-05D	YVD-030717-12	3/7/2017	N	K1702324	0.10	U	-	0.5	U	-	-	-	-	**0.041**	-	-	-	-	-	-	-	-	**3.64**	-	-	**35.6**	-	-	**105**	-	-
DC-05D	YVD-060717-34	6/7/2017	N	K1705833	0.10	U	-	0.5	U	-	-	-	-	**0.012**	-	-	-	-	-	-	-	-	**3.78**	-	-	**37.4**	-	-	**101**	-	-
DC-05D	YVD-092517-02	9/25/2017	N	K1710274	0.10	U	-	0.5	U	-	-	-	-	**0.024**	J	FDP	-	-	-	-	-	-	**3.91**	-	-	**38.7**	-	-	**118**	-	-
DC-05D	YVD-092517-03	9/25/2017	FD	K1710274	0.10	U	-	0.5	U	-	-	-	-	**0.008**	J	FDP	-	-	-	-	-	-	**4.02**	-	-	**38.9**	-	-	**115**	-	-
DC-05D	YVD-120517-20	12/5/2017	N	K1713091	0.10	U	-	0.5	UJ	MSD	-	-	-	**0.013**	-	-	-	-	-	-	-	-	**3.69**	-	-	**37.6**	-	-	**112**	-	-
DC-05D	YVD-031818-08	3/18/2018	N	870610	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.97**	-	-	**41.2**	-	-	**108**	-	-
DC-05D	YVD-060318-03	6/3/2018	N	874568	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.12**	-	-	**39.6**	-	-	**105**	-	-
DC-05D	YVD-060318-05	6/3/2018	FD	874568	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.14**	-	-	**39.6**	-	-	**105**	-	-
DC-05D	YVD-090918-02	9/9/2018	N	880601	0.050	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.00**	-	-	**38.0**	-	-	**107**	-	-
DC-05D	YVD-121118-14	12/11/2018	N	884939	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.15**	-	-	**38.0**	-	-	**102**	-	-
DC-05D	YVD-031719-04	3/17/2019	N	988239	0.050	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.06**	-	-	**38.2**	-	-	**110**	-	-
DC-05D	YVD-031719-06	3/17/2019	FD	988239	0.050	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.11**	-	-	**38.6**	-	-	**109**	-	-
DC-05D	YVD-060219-10	6/2/2019	N	991939	0.050	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.00**	-	-	**37.8**	-	-	**109**	-	-
DC-05D	YVD-090919-12	9/9/2019	N	998357	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.96**	-	-	**35.4**	-	-	**105**	-	-
DC-05D	YVD-120919-05	12/9/2019	N	902276	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.97**	-	-	**36.6**	J	MSD	**105**	-	-
DC-05D	YVD-033020-14	3/30/2020	N	006241	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.01**	-	-	**37.6**	-	-	**107**	-	-
DC-05D	YVD-060820-02	6/8/2020	N	009144	0.050	U	-	0.5	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.03**	-	-	**38.6**	-	-	**118**	-	-

Table 8
Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P-E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-05D	YVD-060820-04	6/8/2020	FD	009144	0.050	U	-	0.5	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.06**	-	-	**38.7**	-	-	**102**	-	-
DC-05D	YVD-092020-04	9/20/2020	N	013864/20I0421	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.02**	-	-	**38.0**	-	-	**107**	-	-
DC-05D	YVD-092020-05	9/20/2020	FD	013864/20I0421	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.03**	-	-	**37.8**	-	-	**106**	-	-
DC-05D	YVD-120720-02	12/7/2020	N	017035	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.30**	-	-	**38.4**	-	-	**108**	-	-
DC-05D	YVD-120720-04	12/7/2020	FD	017035	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.26**	-	-	**38.2**	-	-	**108**	-	-
DC-05D	YVD-030221-18	3/2/2021	N	120034	0.050	U	-	5.0	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.07**	-	-	**37.8**	-	-	**107**	-	-
DC-05D	YVD-060721-13	6/7/2021	N	124105	0.050	U	-	5.0	UJ	MS, RPD	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.11**	-	-	**36.9**	-	-	**106**	-	-
DC-05D	YVD-121421-04	12/14/2021	N	K2114499	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DC-05D	YVD-031422-02	3/14/2022	N	K2202633	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DC-05D	YVD-031422-03	3/14/2022	FD	K2202633	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DC-05D	YVD-060522-04	6/5/2022	N	K2206116	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DC-07	DC-07-130103	01/03/2013	N	EPA01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DC-07	DC-07-130918	09/18/2013	N	SWI0123	2	U	-	0.25	U	-	-	-	-	-	-	-	0.1	U	-	-	-	-	1.00	U	-	**45.7**	-	-	**168**	-	-
DC-07	YVD-D1-130918	09/18/2013	FD	SWI0123	2	U	-	0.25	U	-	-	-	-	-	-	-	0.1	U	-	-	-	-	1.00	U	-	**46.1**	-	-	**179**	-	-
DC-07	DC-07-131210	12/10/2013	N	SWL0055	2	U	-	0.4366	UJ	ERL, MSD	-	-	-	-	-	-	-	-	-	**0.0648**	-	-	**3.82**	-	-	**38.4**	-	-	**117**	-	-
DC-07	DC-07-140316	03/16/2014	N	SXC0081	0.8	U	-	0.25	U	-	**0.11**	-	-	-	-	-	-	-	-	-	-	-	**1.04**	-	-	**33.5**	-	-	**78.9**	-	-
DC-07	DC-07-140602	06/02/2014	N	SXF0008	0.8	U	-	**0.34**	-	-	**0.12**	-	-	-	-	-	-	-	-	-	-	-	1.00	U	-	**36.3**	-	-	**105**	-	-
DC-07	DC-07-140922	09/22/2014	N	SXI0148	0.8	U	-	**0.487**	-	-	**0.19**	-	-	-	-	-	-	-	-	-	-	-	1.00	U	-	**33.7**	-	-	**98.2**	-	-
DC-07	DC-07-141216	12/16/2014	N	SXL0108	0.8	U	-	**0.261**	-	-	0.1	U	-	-	-	-	-	-	-	-	-	-	1.00	U	-	**30.6**	-	-	**80.4**	-	-
DC-07	YVD-D2-141216	12/16/2014	FD	SXL0108	0.2	U	-	**0.305**	-	-	0.1	U	-	-	-	-	-	-	-	-	-	-	1.00	U	-	**30.8**	-	-	**82.1**	-	-
DC-07	DC-07-150317	03/17/2015	N	5904541	0.8	U	-	0.25	UJ	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**1.00**	-	-	**35.0**	-	-	**83**	J-	MSD
DC-07	DC-07-150617	06/17/2015	N	59011021	0.8	U	-	**0.28**	J-	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	1.00	U	-	**37.0**	J	RPD	**93**	-	-
DC-07	DC-07-150924	09/24/2015	N	59020391	0.8	U	-	0.25	UJ	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	1.00	U	-	**33.0**	-	-	**95**	J-	MSD
DC-07	DC-07-151215	12/15/2015	N	59025501	0.8	U	-	-	R	MSD	**0.41**	J-	MSD	-	-	-	-	-	-	-	-	-	1.00	U	-	**34.0**	-	-	**70**	-	-
DC-07	DC-07-160309	03/09/2016	N	59029941	0.8	U	-	-	R	FBK, FDP, MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**1.10**	-	-	**36.0**	-	-	**78**	J	DUP
DC-07	DC-07-160621	6/21/2016	N	59037271	0.8	U	-	-	R	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**1.20**	-	-	**38.0**	-	-	**96**	-	-
DC-07	DC-07-160926	9/26/2016	N	K1611565	0.10	U	-	-	R	MSD	-	-	-	**0.057**	-	-	-	-	-	-	-	-	**1.06**	-	-	**36.6**	-	-	**92.3**	-	-
DC-07	DC-07-161214	12/14/2016	N	K1615083	0.10	U	-	0.5	U	-	-	-	-	**0.078**	-	-	-	-	-	-	-	-	**1.05**	-	-	**32.0**	-	-	**72.4**	-	-
DC-07	YVD-030917-25	3/9/2017	N	K1702448	0.10	U	-	0.5	U	-	-	-	-	**0.093**	-	-	-	-	-	-	-	-	**1.03**	-	-	**32.1**	-	-	**59.8**	-	-
DC-07	YVD-060617-18	6/6/2017	N	K1705754	0.10	U	-	0.5	U	-	-	-	-	**0.061**	-	-	-	-	-	-	-	-	**1.10**	-	-	**34.6**	-	-	**70.4**	-	-
DC-07	YVD-092517-12	9/25/2017	N	K1710333	0.10	U	-	0.5	U	-	-	-	-	**0.058**	-	-	-	-	-	-	-	-	**1.14**	-	-	**34.5**	-	-	**94.2**	-	-
DC-07	YVD-120417-14	12/4/2017	N	K1713026	0.10	U	-	0.5	U	-	-	-	-	**0.064**	-	-	-	-	-	-	-	-	**1.17**	-	-	**33.0**	-	-	**81.9**	-	-
DC-07	YVD-060318-17	6/3/2018	N	874568	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**1.52**	-	-	**37.8**	-	-	**93.4**	-	-
DC-07	YVD-060319-20	6/3/2019	N	992053	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**0.82**	-	-	**44.0**	-	-	**49.5**	-	-
DC-07	YVD-060920-18	6/9/2020	N	009269	0.050	U	-	5.0	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**0.98**	-	-	**59.5**	-	-	**110**	-	-
DC-07	YVD-092120-22	9/21/2020	N	013896	0.050	U	-	2.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**1.02**	-	-	**62.0**	-	-	**77.1**	-	-
DC-07	YVD-120820-22	12/8/2020	N	017137	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**1.06**	-	-	**54.5**	-	-	**59.8**	-	-
DC-07	YVD-030121-10	3/1/2021	N	119931	0.050	U	-	0.5	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**1.02**	-	-	**50.5**	-	-	**73.2**	-	-
DC-07	YVD-060721-16	6/7/2021	N	124105	0.050	U	-	5.0	UJ	MS, RPD	-	-	-	-	-	-	-	-	-	0.070	U	-	**0.96**	-	-	**48.4**	-	-	**23.1**	J	FDP
DC-07	YVD-060721-17	6/7/2021	FD	124105	0.050	U	-	5.0	UJ	MS, RPD	-	-	-	-	-	-	-	-	-	0.070	U	-	**0.97**	-	-	**48.1**	-	-	**37.8**	J	FDP
DC-07	YVD-121521-17	12/15/2021	N	K2114550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DC-07	YVD-031522-13	3/15/2022	N	K2202727	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DC-07	YVD-060522-08	6/5/2022	N	K2206116	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DC-09	DC-09-130103	01/03/2013	N	EPA01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 8
Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P-E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-09	DC-09-130923	09/23/2013	N	SWI0178	-	-	-	**0.447**	-	-	-	-	-	-	-	-	0.1	U	-	-	-	-	**2.75**	-	-	**39.7**	-	-	-	-	-
DC-09	DC-09-130926	09/26/2013	N	SWI0190	0.2	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**30.7**	-	-
DC-09	DC-09-131211	12/11/2013	N	SWL0063	0.2	U	-	0.2	U	-	-	-	-	-	-	-	-	-	-	**0.125**	-	-	**2.48**	-	-	**39.1**	-	-	**34.4**	J-	MSD
DC-09	DC-09-140317	03/17/2014	N	SXC0095	0.2	U	-	**0.251**	-	-	**0.18**	-	-	-	-	-	-	-	-	-	-	-	**2.88**	-	-	**36.5**	-	-	**28.8**	J-	MSD
DC-09	DC-09-140602	06/02/2014	N	SXF0008	0.2	U	-	**0.279**	-	-	**0.22**	J	FDP	-	-	-	-	-	-	-	-	-	**2.92**	-	-	**38.1**	-	-	**29.4**	-	-
DC-09	YVD-D3-140602	06/02/2014	FD	SXF0008	0.2	U	-	**0.359**	-	-	**0.16**	J	FDP	-	-	-	-	-	-	-	-	-	**3.08**	-	-	**37.9**	-	-	**29.1**	-	-
DC-09	DC-09-140923	09/23/2014	N	SXI0158	0.2	U	-	0.25	U	-	0.05	U	-	-	-	-	-	-	-	-	-	-	**1.94**	-	-	**38.9**	J+	MSD	**29.6**	-	-
DC-09	DC-09-141216	12/16/2014	N	SXL0108	0.2	U	-	0.25	U	-	**0.13**	-	-	-	-	-	-	-	-	-	-	-	**2.48**	-	-	**39.1**	-	-	**30.2**	-	-
DC-09	DC-09-150316	03/16/2015	N	5904541	0.2	U	-	0.25	UJ	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**2.60**	-	-	**43.0**	-	-	**29**	J-	MSD
DC-09	DC-09-150616	06/16/2015	N	59010751	0.2	U	-	0.25	UJ	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**2.30**	J+	MSD	**38.0**	J+	MSD	**28**	J-	MSD
DC-09	DC-09-150923	09/23/2015	N	59020281	0.2	U	-	-	R	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**2.50**	-	-	**40.0**	-	-	**30**	-	-
DC-09	DC-09-151214	12/14/2015	N	59025431	0.2	U	-	-	R	MSD	**0.3**	J	FDP	-	-	-	-	-	-	-	-	-	**2.70**	-	-	**40.0**	-	-	**31**	-	-
DC-09	DC-09-160308	03/08/2016	N	59029711	0.2	U	-	-	R	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**3.30**	-	-	**39.0**	-	-	**31**	J+	MSD
DC-09	YVD-D2-160308	03/08/2016	FD	59029711	0.2	U	-	-	R	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**3.10**	-	-	**39.0**	-	-	**31**	J+	MSD
DC-09	DC-09-160621	6/21/2016	N	59037151	0.2	U	-	0.25	U	-	0.25	U	-	-	-	-	-	-	-	-	-	-	**2.20**	-	-	**41.0**	-	-	**32**	-	-
DC-09	DC-09-160929	9/29/2016	N	K1611704	0.10	U	-	0.5	U	-	-	-	-	**0.016**	-	-	-	-	-	-	-	-	**2.00**	-	-	**39.3**	-	-	**29.8**	-	-
DC-09	DC-09-D4-160929	9/29/2016	FD	K1611704	0.10	U	-	0.5	U	-	-	-	-	**0.013**	-	-	-	-	-	-	-	-	**1.98**	-	-	**38.8**	-	-	**29.6**	-	-
DC-09	DC-09-161215	12/15/2016	N	K1615126	0.10	U	-	0.5	U	-	-	-	-	**0.009**	J	-	-	-	-	-	-	-	**1.99**	-	-	**38.9**	-	-	**30.6**	-	-
DC-09	YVD-D4-161215	12/15/2016	FD	K1615126	0.10	U	-	0.5	U	-	-	-	-	**0.007**	J	-	-	-	-	-	-	-	**1.98**	-	-	**37.8**	-	-	**30.6**	-	-
DC-09	YVD-031317-36	3/13/2017	N	K1702489	0.10	U	-	0.5	U	-	-	-	-	**0.024**	-	-	-	-	-	-	-	-	**2.00**	-	-	**38.8**	-	-	**28.2**	-	-
DC-09	YVD-060717-27	6/7/2017	N	K1705833	0.10	U	-	0.5	U	-	-	-	-	**0.029**	-	-	-	-	-	-	-	-	**1.97**	-	-	**39.3**	-	-	**30.3**	-	-
DC-09	YVD-092617-23	9/26/2017	N	K1710333	0.10	U	-	0.5	U	-	-	-	-	0.010	U	-	-	-	-	-	-	-	**1.98**	-	-	**38.5**	-	-	**32.5**	-	-
DC-09	YVD-120417-09	12/4/2017	N	K1713026	0.10	U	-	0.5	U	-	-	-	-	0.014	U	MBK	-	-	-	-	-	-	**1.86**	-	-	**37.3**	-	-	**30.6**	-	-
DC-09	YVD-060418-25	6/4/2018	N	874860	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.08**	-	-	**40.2**	-	-	**29.2**	-	-
DC-09	YVD-060319-19	6/3/2019	N	992053	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.06**	-	-	**39.2**	-	-	**27.6**	-	-
DC-09	YVD-060920-25	6/9/2020	N	009269	0.050	U	-	5.0	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.04**	-	-	**40.8**	-	-	**30.8**	-	-
DC-09	YVD-060721-15	6/7/2021	N	124105	0.050	U	-	5.0	UJ	MS, RPD	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.13**	-	-	**37.4**	-	-	**14.8**	-	-
DC-09	YVD-060722-29	6/7/2022	N	K2206237	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	-	-	**-**	-	-	**-**	-	-
DC-14	DC-14-130103	01/03/2013	N	EPA01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DC-14	DC-14-130917	09/17/2013	N	SWI0113	0.2	U	-	**0.31**	-	-	-	-	-	-	-	-	**0.199**	-	-	-	-	-	**5.85**	-	-	**94.9**	-	-	**34.2**	-	-
DC-14	DC-14-131211	12/11/2013	N	SWL0063	2	U	-	0.2	U	-	-	-	-	-	-	-	-	-	-	**0.167**	-	-	**4.71**	-	-	**94.0**	-	-	**33.9**	J-	MSD
DC-14	DC-14-140318	03/18/2014	N	SXC0095	2	U	-	0.25	U	-	**0.26**	-	-	-	-	-	-	-	-	-	-	-	**5.25**	-	-	**87.0**	-	-	**35.7**	J-	MSD
DC-14	DC-14-140602	06/02/2014	N	SXF0017	0.4	U	-	**0.367**	-	-	**0.42**	J+	FBK	-	-	-	-	-	-	-	-	-	**5.37**	-	-	**83.2**	-	-	**24.2**	J-	MSD
DC-14	DC-14-140923	09/23/2014	N	SXI0158	0.4	U	-	**0.315**	-	-	**0.3**	-	-	-	-	-	-	-	-	-	-	-	**4.95**	-	-	**88.6**	J+	MSD	**25.9**	-	-
DC-14	DC-14-141216	12/16/2014	N	SXL0108	0.4	U	-	0.25	U	-	**0.14**	-	-	-	-	-	-	-	-	-	-	-	**5.57**	-	-	**84.5**	-	-	**29.8**	-	-
DC-14	DC-14-150316	03/16/2015	N	5904541	0.4	U	-	0.25	UJ	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**6.10**	-	-	**100**	-	-	**38**	J-	MSD
DC-14	DC-14-150616	06/16/2015	N	59010961	0.4	U	-	0.25	UJ	MSD	**0.3**	-	-	-	-	-	-	-	-	-	-	-	**6.50**	J+	MSD	**85.0**	J+	MSD	**29**	-	-
DC-14	DC-14-150924	09/24/2015	N	59020391	0.4	U	-	0.25	UJ	MSD	**0.31**	-	-	-	-	-	-	-	-	-	-	-	**6.30**	-	-	**92.0**	-	-	**42**	J-	MSD
DC-14	DC-14-151214	12/14/2015	N	59025351	0.4	U	-	0.25	UJ	MSD	**0.35**	-	-	-	-	-	-	-	-	-	-	-	**6.60**	-	-	**100**	-	-	**39**	-	-
DC-14	YVD-D1-151214	12/14/2015	FD	59025351	0.2	U	-	0.25	UJ	MSD	**0.38**	-	-	-	-	-	-	-	-	-	-	-	**6.60**	-	-	**100**	-	-	**41**	-	-
DC-14	DC-14-160309	03/09/2016	N	59029711	0.4	U	-	-	R	MSD	**0.33**	-	-	-	-	-	-	-	-	-	-	-	**6.60**	-	-	**95.0**	-	-	**39**	J+	MSD
DC-14	DC-14-160620	6/20/2016	N	59037151	0.4	U	-	0.25	U	-	0.25	U	-	-	-	-	-	-	-	-	-	-	**6.00**	-	-	**92.0**	-	-	**38**	-	-
DC-14	DC-14-160929	9/29/2016	N	K1611704	0.10	U	-	0.5	U	-	-	-	-	**0.009**	J	-	-	-	-	-	-	-	**4.75**	-	-	**74.9**	-	-	**23.1**	-	-
DC-14	DC-14-161216	12/16/2016	N	K1615174	0.10	U	-	0.5	U	-	-	-	-	**0.014**	-	-	-	-	-	-	-	-	**4.37**	-	-	**68.8**	-	-	**21.9**	-	-
DC-14	YVD-031317-38	3/14/2017	N	K1702542	0.10	U	-	0.5	U	-	-	-	-	**0.074**	-	-	-	-	-	-	-	-	**4.57**	-	-	**68.4**	-	-	**20.8**	-	-
DC-14	YVD-060617-19	6/6/2017	N	K1705754	0.10	U	-	0.5	U	-	-	-	-	**0.010**	J	-	-	-	-	-	-	-	**4.40**	-	-	**65.2**	-	-	**26.9**	-	-
DC-14	YVD-092517-11	9/25/2017	N	K1710274	0.10	U	-	0.5	U	-	-	-	-	**0.005**	J	-	-	-	-	-	-	-	**4.63**	-	-	**64.3**	-	-	**23.9**	-	-

Table 8
Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P-E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-14	YVD-120617-27	12/6/2017	N	K1713157	0.10	U	-	0.5	U	-	-	-	-	**0.020**	-	-	-	-	-	-	-	-	**4.49**	-	-	**60.5**	-	-	**20.3**	-	-
DC-14	YVD-120617-29	12/6/2017	FD	K1713157	0.10	U	-	0.5	U	-	-	-	-	**0.021**	-	-	-	-	-	-	-	-	**4.44**	-	-	**60.6**	-	-	**20.0**	-	-
DC-14	YVD-031918-20	3/19/2018	N	870634	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.56**	-	-	**58.0**	-	-	**17.8**	-	-
DC-14	YVD-060518-28	6/5/2018	N	874860	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.62**	-	-	**56.0**	-	-	**16.1**	-	-
DC-14	YVD-060518-30	6/5/2018	FD	874860	-	R	PRS	0.5	UJ	MBK	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.78**	-	-	**57.5**	-	-	-	R	PRS
DC-14	YVD-090918-08	9/9/2018	N	880601	0.050	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.80**	-	-	**54.0**	-	-	**16.0**	-	-
DC-14	YVD-090918-10	9/9/2018	FD	880601	0.050	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.78**	-	-	**53.5**	-	-	**15.3**	-	-
DC-14	YVD-121018-07	12/10/2018	N	884857	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.92**	-	-	**55.5**	-	-	**14.9**	-	-
DC-14	YVD-031719-09	3/17/2019	N	988239	0.050	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**5.05**	-	-	**53.5**	-	-	**15.1**	-	-
DC-14	YVD-060319-17	6/3/2019	N	992053	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**5.15**	-	-	**53.5**	-	-	**13.6**	-	-
DC-14	YVD-091019-18	9/10/2019	N	998438	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**5.20**	-	-	**53.5**	-	-	**17.1**	-	-
DC-14	YVD-120919-14	12/9/2019	N	902276	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**5.40**			**54.5**	J	MSD	**20.3**	-	-
DC-14	YVD-033120-19	3/31/2020	N	006260	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**5.25**	-	-	**53.5**	-	-	**21.1**	-	-
DC-14	YVD-033120-21	3/31/2020	FD	006260	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**5.35**	-	-	**54.5**	-	-	**21.3**	-	-
DC-14	YVD-061020-32	6/10/2020	N	009361	0.050	U	-	0.5	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**5.45**	-	-	**53.0**	-	-	**22.5**	-	-
DC-14	YVD-061020-33	6/10/2020	FD	009361	0.050	U	-	0.5	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**5.35**	-	-	**52.0**	-	-	**22.4**	-	-
DC-14	YVD-092120-23	9/21/2020	N	013896	0.050	U	-	1.0	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**5.60**	-	-	**56.5**	-	-	**24.4**	-	-
DC-14	YVD-120820-21	12/8/2020	N	017137	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**6.10**	-	-	**57.5**	-	-	**26.6**	-	-
DC-14	YVD-030121-09	3/1/2021	N	119931	0.050	U	-	5.0	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**6.15**	-	-	**58.0**	-	-	**32.1**	-	-
DC-14	YVD-060821-33	6/8/2021	N	124212	0.050	U	-	0.50	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**6.35**	-	-	**57.0**	-	-	**27.9**	-	-
DC-14	YVD-121521-19	12/15/2021	N	K2114550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DC-14	YVD-031522-16	3/15/2022	N	K2202727	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DC-14	YVD-060722-28	6/7/2022	N	K2206237	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-02	YVD-02-130924	09/24/2013	N	SWI0178	0.2	U	-	0.25	U	-	-	-	-	-	-	-	**0.124**	-	-	-	-	-	**3.50**	-	-	**8.6**	-	-	**5.77**	-	-
YVD-02	YVD-02-140316	03/16/2014	N	SXC0081	0.2	U	-	0.25	U	-	**0.54**	-	-	-	-	-	-	-	-	-	-	-	**12.60**	-	-	**88.6**	-	-	**66.9**	-	-
YVD-02	YVD-02-140602	06/02/2014	N	SXF0008	0.2	U	-	**0.49**	-	-	**3.8**	-	-	-	-	-	-	-	-	-	-	-	**8.53**	-	-	**23.0**	-	-	**3.12**	-	-
YVD-02	YVD-02-140921	09/21/2014	N	SXI0148	0.2	U	-	**0.274**	-	-	**1.2**	J	FDP	-	-	-	-	-	-	-	-	-	**4.53**	-	-	**11.6**	J	FDP	**13.8**	-	-
YVD-02	YVD-D1-140921	09/21/2014	FD	SXI0148	0.2	U	-	0.25	U	-	**0.86**	J	FDP	-	-	-	-	-	-	-	-	-	**5.05**	-	-	**15.7**	J	FDP	**15.6**	-	-
YVD-02	YVD-02-141215	12/15/2014	N	SXL0103	0.2	U	-	**0.358**	-	-	**0.61**	-	-	-	-	-	-	-	-	-	-	-	**5.35**	-	-	**16.1**	-	-	**33.6**	J+	MSD, DUP
YVD-02	YVD-02-150615	06/15/2015	N	59010751	0.2	U	-	0.25	UJ	MSD	**1.1**	-	-	-	-	-	-	-	-	-	-	-	**4.10**	J+	MSD	**12.0**	J+	MSD	**3.2**	J-	MSD
YVD-02	YVD-02-150923	09/23/2015	N	59020281	0.2	U	-	**0.25**	J-	MSD	**1**	J+	FBK		-	-	-	-	-	-	-	-	**4.80**	-	-	**14.0**	-	-	**9.5**	-	-
YVD-02	YVD-02-151214	12/14/2015	N	59025351	0.2	U	-	**0.76**	J-	MSD	**0.68**	-	-	-	-	-	-	-	-	-	-	-	**6.30**	-	-	**25.0**	-	-	**24**	-	-
YVD-02	YVD-02-160308	03/08/2016	N	59029521	0.2	U	-	**0.25**	J-	MSD	**0.59**	-	-	-	-	-	-	-	-	-	-	-	**5.80**	-	-	**22.0**	-	-	**54**	-	-
YVD-02	YVD-02-160620	6/20/2016	N	59037101	0.2	U	-	**0.35**	J-	MSD	**0.52**	-	-	-	-	-	-	-	-	-	-	-	**4.20**	-	-	**9.7**	-	-	**8**	J-	MSD
YVD-02	YVD-02-160928	9/28/2016	N	K1611629	0.10	U	-	0.5	U	-	-	-	-	**0.092**	-	-	-	-	-	-	-	-	**3.41**	-	-	**5.07**	-	-	**3.13**	-	-
YVD-02	YVD-030817-15	3/8/2017	N	K1702324	0.10	U	-	0.5	U	-	-	-	-	**0.099**	-	-	-	-	-	-	-	-	**3.51**	-	-	**7.06**	-	-	**11.7**	-	-
YVD-02	YVD-060617-14	6/6/2017	N	K1705754	0.10	U	-	0.5	U	-	-	-	-	**0.093**	-	-	-	-	-	-	-	-	**3.00**	-	-	**5.95**	-	-	**3.43**	J	FDP
YVD-02	YVD-060617-16	6/6/2017	FD	K1705754	0.10	U	-	0.5	U	-	-	-	-	**0.081**	-	-	-	-	-	-	-	-	**3.00**	-	-	**5.91**	-	-	**12.2**	J	FDP
YVD-02	YVD-092617-20	9/26/2017	N	K1710333	0.10	U	-	0.5	U	-	-	-	-	**0.09**	-	-	-	-	-	-	-	-	**3.06**	-	-	**5.20**	-	-	**4.79**	-	-
YVD-02	YVD-120417-02	12/4/2017	N	K1713026	0.10	U	-	0.5	U	-	-	-	-	**0.080**	-	-	-	-	-	-	-	-	**3.18**	-	-	**9.59**	-	-	**16.1**	-	-
YVD-02	YVD-120417-04	12/4/2017	FD	K1713026	0.10	U	-	0.5	U	-	-	-	-	**0.074**	-	-	-	-	-	-	-	-	**3.08**	-	-	**9.58**	-	-	**15.8**	-	-
YVD-02	YVD-061218-32	6/12/2018	N	875438	-	R	NR	-	R	NR	-	-	-	-	-	-	-	-	-	-	R	NR	-	R	NR	-	R	NR	-	R	NR
YVD-02	YVD-060419-28	6/4/2019	N	992242	**0.24**	-	-	0.5	U	-	-	-	-	-	-	-	-	-	-	**0.10**	-	-	**5.15**	-	-	**14.8**	-	-	**39.9**	-	-
YVD-02	YVD-070219-33	7/2/2019	N	994356	**0.90**	-	-	NS	-	-	-	-	-	-	-	-	-	-	-	0.07	U	-	**6.50**	-	-	**26.8**	-	-	**47.5**	-	-
YVD-02	YVD-091019-19	9/10/2019	N	998438	0.05	U	-	UJ	MSD	-	-	-	-	-	-	-	-	-	-	**0.07**	-	-	**6.60**	-	-	**21.6**	-	-	**40.4**	-	-
YVD-02	YVD-121019-23	12/10/2019	N	902321	0.05	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.07	U	-	**7.10**	-	-	**38.3**	-	-	**62.2**	-	-
YVD-02	YVD-040120-23	4/1/2020	N	006311	**4.38**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**6.25**	-	-	**75.0**	-	-	**96.6**	-	-

Table 8
Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P-E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-02	YVD-061120-35	6/11/2020	N	009430	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-02	NS[1]	9/21/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-02	NS[1]	12/8/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-02	NS[1]	3/1/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-02	NS[1]	6/8/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-02	NS[1]	12/15/2021	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-02	NS[1]	3/15/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-02	NS[1]	6/7/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-03	YVD-03-130916	09/16/2013	N	SWI0113	**0.49**	-	-	**0.488**	-	-	-	-	-	-	-	-	**0.89**	-	-	-	-	-	**9.00**	-	-	**43.0**	-	-	**70.7**	-	-
YVD-03	YVD-03-131210	12/10/2013	N	SWL0063	0.4	U	-	0.2	U	-	-	-	-	-	-	-	-	-	-	**1.02**	-	-	**6.67**	-	-	**40.2**	-	-	**54.8**	J-	MSD
YVD-03	YVD-03-140317	03/17/2014	N	SXC0081	0.2	U	-	0.25	U	-	**0.23**	-	-	-	-	-	-	-	-	-	-	-	**4.10**	-	-	**37.6**	-	-	**38**	-	-
YVD-03	YVD-03-140602	06/02/2014	N	SXF0008	0.2	U	-	**0.261**	-	-	**0.3**	-	-	-	-	-	-	-	-	-	-	-	**3.93**	-	-	**36.8**	-	-	**36**	-	-
YVD-03	YVD-03-140923	09/23/2014	N	SXI0158	0.2	U	-	0.25	U	-	**0.33**	J	FDP	-	-	-	-	-	-	-	-	-	**4.66**	J	FDP	**40.7**	J+	MSD	**34.7**	-	-
YVD-03	YVD-D3-140923	09/23/2014	FD	SXI0158	0.2	U	-	0.25	U	-	**0.24**	J	FDP	-	-	-	-	-	-	-	-	-	**3.62**	J	FDP	**38.0**	J+	MSD	**34.4**	-	-
YVD-03	YVD-03-141215	12/15/2014	N	SXL0108	0.2	U	-	**0.4**	-	-	**0.76**	-	-	-	-	-	-	-	-	-	-	-	**4.47**	-	-	**39.1**	-	-	**37**	-	-
YVD-03	YVD-03-150316	03/16/2015	N	5904541	0.2	U	-	0.25	UJ	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**3.90**	-	-	**39.0**	-	-	**33**	J-	MSD
YVD-03	YVD-03-150616	06/16/2015	N	59010751	0.2	U	-	0.25	UJ	MSD	**0.59**	-	-	-	-	-	-	-	-	-	-	-	**6.10**	J+	MSD	**37.0**	J+	MSD	**41**	J-	MSD
YVD-03	YVD-03-150922	09/22/2015	N	59020141	0.2	U	-	0.25	UJ	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**6.50**	-	-	**40.0**	-	-	**51**	-	-
YVD-03	YVD-03-151214	12/14/2015	N	59025351	0.2	U	-	0.25	UJ	MSD	**0.78**	-	-	-	-	-	-	-	-	-	-	-	**7.80**	-	-	**43.0**	-	-	**51**	-	-
YVD-03	YVD-03-160307	03/07/2016	N	59029521	0.2	U	-	0.25	UJ	MSD	**0.34**	-	-	-	-	-	-	-	-	-	-	-	**7.10**	-	-	**40.0**	-	-	**47**	-	-
YVD-03	YVD-03-160620	6/20/2016	N	59037151	0.2	U	-	0.25	U	-	**0.47**	-	-	-	-	-	-	-	-	-	-	-	**7.70**	-	-	**40.0**	-	-	**61**	-	-
YVD-03	YVD-03-160929	9/29/2016	N	K1611758	0.10	U	-	0.5	U	-	-	-	-	**0.047**	-	-	-	-	-	-	-	-	**6.89**	-	-	**41.4**	-	-	**44.4**	-	-
YVD-03	YVD-03-161213	12/13/2016	N	K1615045	0.10	U	-	0.5	U	-	-	-	-	**0.11**	-	-	-	-	-	-	-	-	**6.57**	-	-	**38.9**	-	-	**43.3**	-	-
YVD-03	YVD-030617-02	3/6/2017	N	K1702228	0.10	U	-	0.5	U	-	-	-	-	**0.083**	J	FDP	-	-	-	-	-	-	**6.53**	-	-	**38.5**	-	-	**40.7**	-	-
YVD-03	YVD-030617-03	3/6/2017	FD	K1702228	0.10	U	-	0.5	U	-	-	-	-	**0.061**	J	FDP	-	-	-	-	-	-	**6.48**	-	-	**38.4**	-	-	**40.7**	-	-
YVD-03	YVD-060517-13	6/5/2017	N	K1705702	0.10	U	-	0.5	U	-	-	-	-	**0.045**	-	-	-	-	-	-	-	-	**6.27**	-	-	**36.4**	-	-	**46.4**	-	-
YVD-03	YVD-092517-05	9/25/2017	N	K1710274	0.10	U	-	0.5	U	-	-	-	-	**0.038**	-	-	-	-	-	-	-	-	**6.85**	-	-	**40.9**	-	-	**46.3**	-	-
YVD-03	YVD-120517-19	12/5/2017	N	K1713091	0.10	U	-	0.5	UJ	MSD	-	-	-	**0.047**	-	-	-	-	-	-	-	-	**6.39**	-	-	**38.0**	-	-	**50.8**	-	-
YVD-03	YVD-060518-27	6/5/2018	N	874860	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**6.70**	-	-	**39.3**	-	-	**41.7**	-	-
YVD-03	YVD-060219-07	6/2/2019	N	991939	0.050	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**6.65**	-	-	**38.5**	-	-	**26.1**	-	-
YVD-03	YVD-060820-09	6/8/2020	N	009144	0.050	U	-	0.5	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**6.65**	-	-	**39.6**	-	-	**48.6**	-	-
YVD-03	YVD-060821-24	6/8/2021	N	124212	0.050	U	-	0.50	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**6.85**	-	-	**37.6**	-	-	**33.0**	-	-
YVD-03	YVD-060822-31	6/8/2022	N	K2206299	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	-	-	**-**	-	-	**-**	-	-
YVD-03	YVD-060822-32	6/8/2022	FD	K2206299	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	-	-	**-**	-	-	**-**	-	-
YVD-04	YVD-04-130916	09/16/2013	N	SWI0113	0.2	U	-	0.25	U	-	-	-	-	-	-	-	0.1	U	-	-	-	-	**4.23**	-	-	**49.2**	-	-	**39.1**	-	-
YVD-04	YVD-04-131210	12/10/2013	N	SWL0063	0.4	U	-	0.2	U	-	-	-	-	-	-	-	-	-	-	**0.112**	-	-	**4.44**	-	-	**49.9**	-	-	**42.2**	J-	MSD
YVD-04	YVD-04-140317	03/17/2014	N	SXC0081	0.2	U	-	0.25	U	-	**0.078**	-	-	-	-	-	-	-	-	-	-	-	**4.46**	-	-	**47.8**	-	-	**35.2**	-	-
YVD-04	YVD-04-140602	06/02/2014	N	SXF0008	0.4	U	-	0.25	U	-	**0.053**	-	-	-	-	-	-	-	-	-	-	-	**4.41**	-	-	**50.5**	-	-	**36.2**	-	-
YVD-04	YVD-04-140923	09/23/2014	N	SXI0158	0.2	U	-	0.25	U	-	**0.061**	-	-	-	-	-	-	-	-	-	-	-	**4.49**	-	-	**52.2**	J+	MSD	**35.8**	-	-
YVD-04	YVD-04-141215	12/15/2014	N	SXL0108	0.2	U	-	0.25	U	-	0.1	U	-	-	-	-	-	-	-	-	-	-	**4.62**	-	-	**50.0**	-	-	**35.8**	-	-
YVD-04	YVD-04-150315	03/15/2015	N	5904471	0.2	U	-	0.25	UJ	MSD	0.25	UJ	MSD	-	-	-	-	-	-	-	-	-	**4.70**	-	-	**52.0**	-	-	**34**	-	-
YVD-04	YVD-04-150615	06/15/2015	N	59010751	0.2	U	-	0.25	UJ	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**4.70**	J+	MSD	**49.0**	J+	MSD	**34**	J-	MSD
YVD-04	YVD-04-150922	09/22/2015	N	59020141	0.2	U	-	0.25	UJ	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**4.60**	-	-	**51.0**	-	-	**35**	-	-
YVD-04	YVD-04-151213	12/13/2015	N	59025351	0.2	U	-	0.25	UJ	MSD	**0.39**	-	-	-	-	-	-	-	-	-	-	-	**4.90**	-	-	**53.0**	-	-	**36**	-	-
YVD-04	YVD-04-160307	03/07/2016	N	59029521	0.2	U	-	0.25	UJ	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**4.60**	-	-	**51.0**	-	-	**34**	-	-
YVD-04	YVD-04-160620	6/20/2016	N	59037101	0.2	U	-	0.25	UJ	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**4.80**	-	-	**53.0**	-	-	**35**	J-	MSD
YVD-04	YVD-D1-160620	6/20/2016	FD	59037101	0.2	U	-	0.25	UJ	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**4.50**	-	-	**51.0**	-	-	**36**	J-	MSD

Table 8
Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P-E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-04	YVD-04-160928	9/28/2016	N	K1611629	0.10	U	-	0.5	U	-	-	-	-	**0.014**	-	-	-	-	-	-	-	-	**4.42**	-	-	**48.5**	-	-	**31.4**	-	-
YVD-04	YVD-04-D3-160928	9/28/2016	FD	K1611629	0.10	U	-	0.5	U	-	-	-	-	**0.008**	J	-	-	-	-	-	-	-	**4.49**	-	-	**49.9**	-	-	**32.2**	-	-
YVD-04	YVD-04-161213	12/13/2016	N	K1615045	0.10	U	-	0.5	U	-	-	-	-	**0.026**	-	-	-	-	-	-	-	-	**4.43**	-	-	**47.5**	-	-	**31.7**	-	-
YVD-04	YVD-031017-28	3/10/2017	N	K1702448	0.10	U	-	0.5	U	-	-	-	-	**0.018**	-	-	-	-	-	-	-	-	**4.25**	-	-	**46.7**	-	-	**32.9**	-	-
YVD-04	YVD-060517-11	6/5/2017	N	K1705702	0.10	U	-	0.5	U	-	-	-	-	**0.006**	J	-	-	-	-	-	-	-	**4.05**	-	-	**44.4**	-	-	**33.4**	-	-
YVD-04	YVD-092517-07	9/25/2017	N	K1710274	0.10	U	-	0.5	U	-	-	-	-	**0.026**	-	-	-	-	-	-	-	-	**4.62**	-	-	**51.1**	-	-	**32.7**	-	-
YVD-04	YVD-120417-13	12/4/2017	N	K1713091	0.10	U	-	0.5	UJ	MSD	-	-	-	**0.013**	-	-	-	-	-	-	-	-	**4.29**	-	-	**49.9**	-	-	**32.5**	-	-
YVD-04	YVD-060418-21	6/4/2018	N	874662	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.46**	-	-	**51.0**	-	-	**30.4**	-	-
YVD-04	YVD-060219-05	6/2/2019	N	991939	0.050	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.52**	-	-	**49.0**	-	-	**30.6**	-	-
YVD-04	YVD-060820-05	6/8/2020	N	009144	0.050	U	-	0.5	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.32**	-	-	**49.8**	-	-	**30.5**	-	-
YVD-04	YVD-060821-22	6/8/2021	N	124212	0.050	U	-	1.0	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.32**	-	-	**47.4**	-	-	**29.5**	-	-
YVD-04	YVD-060622-17	6/6/2022	N	K2206160	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	-	-	**-**	-	-	**-**	-	-
YVD-05	YVD-05-130917	09/17/2013	N	SWI0113	0.2	U	-	**0.435**	-	-	-	-	-	-	-	-	**1.62**	-	-	-	-	-	**6.95**	-	-	**46.2**	-	-	**76.8**	-	-
YVD-05	YVD-05-131211	12/11/2013	N	SWL0063	0.4	U	-	0.2	U	-	-	-	-	-	-	-	-	-	-	**0.462**	-	-	**3.33**	-	-	**45.5**	-	-	**68.4**	J-	MSD
YVD-05	YVD-05-140317	03/17/2014	N	SXC0081	0.4	U	-	0.25	U	-	**0.14**	-	-	-	-	-	-	-	-	-	-	-	**2.75**	-	-	**43.1**	-	-	**52.7**	-	-
YVD-05	YVD-05-140601	06/01/2014	N	SXF0008	0.4	U	-	0.25	U	-	**0.15**	-	-	-	-	-	-	-	-	-	-	-	**2.84**	-	-	**43.9**	-	-	**50.5**	-	-
YVD-05	YVD-05-140922	09/22/2014	N	SXI0148	0.4	U	-	**0.259**	-	-	**0.2**	-	-	-	-	-	-	-	-	-	-	-	**2.75**	-	-	**45.1**	-	-	**48.1**	-	-
YVD-05	YVD-05-141215	12/15/2014	N	SXL0103	0.4	U	-	**0.272**	-	-	**0.29**	J	FDP	-	-	-	-	-	-	-	-	-	**4.21**	-	-	**45.5**	-	-	**27.7**	J+	MSD, FDP, DUP
YVD-05	YVD-D1-141215	12/15/2014	FD	SXL0103	0.2	U	-	**0.264**	-	-	**0.44**	J	FDP	-	-	-	-	-	-	-	-	-	**3.54**	-	-	**44.9**	-	-	**46**	J+	MSD, FDP, DUP
YVD-05	YVD-05-150316	03/16/2015	N	5904471	0.4	U	-	0.25	UJ	-	0.25	UJ	MSD	-	-	-	-	-	-	-	-	-	**3.60**	-	-	**47.0**	-	-	**47**	-	-
YVD-05	YVD-05-150616	06/16/2015	N	59010751	0.4	U	-	0.25	UJ	-	**0.51**	-	-	-	-	-	-	-	-	-	-	-	**4.00**	J+	MSD	**47.0**	J+	MSD	**49**	J-	MSD
YVD-05	YVD-05-150922	09/22/2015	N	59020281	0.4	U	-	-	R	MSD	**0.8**	-	-	-	-	-	-	-	-	-	-	-	**4.90**	-	-	**51.0**	-	-	**51**	-	-
YVD-05	YVD-05-151214	12/14/2015	N	59025351	0.4	U	-	**0.6**	J-	MSD	**0.65**	-	-	-	-	-	-	-	-	-	-	-	**4.30**	-	-	**52.0**	-	-	**48**	-	-
YVD-05	YVD-05-160307	03/07/2016	N	59029521	0.4	U	-	0.25	UJ	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**3.60**	-	-	**48.0**	-	-	**47**	-	-
YVD-05	YVD-D1-160307	03/07/2016	FD	59029521	0.2	U	-	0.25	UJ	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**3.60**	-	-	**48.0**	-	-	**48**	-	-
YVD-05	YVD-05-160620	6/20/2016	N	59037151	0.4	U	-	0.25	U	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**3.40**	-	-	**48.0**	-	-	**49**	-	-
YVD-05	YVD-05-160928	9/28/2016	N	K1611698	0.10	U	-	-	R	MSD	-	-	-	**0.01**	-	-	-	-	-	-	-	-	**3.54**	-	-	**48.5**	-	-	**46.7**	-	-
YVD-05	YVD-05-161215	12/15/2016	N	K1615174	0.10	U	-	0.5	U	-	-	-	-	**0.04**	-	-	-	-	-	-	-	-	**3.37**	-	-	**46.5**	-	-	**49.0**	-	-
YVD-05	YVD-031317-32	3/13/2017	N	K1702489	0.10	U	-	0.5	U	-	-	-	-	**0.03**	-	-	-	-	-	-	-	-	**3.44**	-	-	**46.0**	-	-	**41.5**	-	-
YVD-05	YVD-031317-34	3/13/2017	FD	K1702489	0.10	U	-	0.5	U	-	-	-	-	**0.02**	-	-	-	-	-	-	-	-	**3.38**	-	-	**45.6**	-	-	**41.4**	-	-
YVD-05	YVD-060617-23	6/6/2017	N	K1705754	0.10	U	-	0.5	U	-	-	-	-	**0.016**	-	-	-	-	-	-	-	-	**3.51**	-	-	**48.1**	-	-	**48.0**	-	-
YVD-05	YVD-092517-09	9/25/2017	N	K1710274	0.10	U	-	0.5	U	-	-	-	-	**0.012**	-	-	-	-	-	-	-	-	**3.61**	-	-	**48.4**	-	-	**46.6**	-	-
YVD-05	YVD-120517-15	12/5/2017	N	K1713091	0.10	U	-	0.5	UJ	MSD	-	-	-	**0.015**	-	-	-	-	-	-	-	-	**3.36**	-	-	**46.5**	-	-	**41.8**	-	-
YVD-05	YVD-060518-29	6/5/2018	N	874860	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.58**	-	-	**46.4**	-	-	**43.6**	-	-
YVD-05	YVD-060219-09	6/2/2019	N	991939	0.050	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.62**	-	-	**44.2**	-	-	**43.6**	-	-
YVD-05	YVD-060920-15	6/9/2020	N	009269	0.050	U	-	5.0	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.66**	-	-	**46.2**	-	-	**50.0**	-	-
YVD-05	YVD-060821-26	6/8/2021	N	124212	0.050	U	-	0.50	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.94**	-	-	**47.7**	-	-	**61.1**	-	-
YVD-05	YVD-060622-19	6/6/2022	N	K2206160	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	-	-	**-**	-	-	**-**	-	-
YVD-06	YVD-06-130917	09/17/2013	N	SWI0113	0.2	U	-	**0.4**	-	-	-	-	-	-	-	-	**0.41**	-	-	-	-	-	**4.07**	-	-	**17.6**	-	-	**8.14**	-	-
YVD-06	YVD-06-131209	12/09/2013	N	SWL0055	0.2	U	-	**0.62**	J	FBK, MSD, FDP	-	-	-	-	-	-	-	-	-	0.06	U	-	**1.76**	-	-	**13.0**	J	FDP	**8.53**	-	-
YVD-06	YVD-D1-131209	12/09/2013	FD	SWL0055	2	U	-	**0.4**	J	FBK, MSD, FDP	-	-	-	-	-	-	-	-	-	0.06	U	-	**2.24**	-	-	**16.5**	J	FDP	**9.1**	-	-

Table 8
Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P-E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-06	YVD-06-140316	03/16/2014	N	SXC0081	0.2	U	-	**0.297**	-	-	**0.14**	-	-	-	-	-	-	-	-	-	-	-	**2.68**	-	-	**16.2**	-	-	**8.33**	-	-
YVD-06	YVD-D1-140316	03/16/2014	FD	SXC0081	0.2	U	-	0.25	U	-	**0.13**	-	-	-	-	-	-	-	-	-	-	-	**2.74**	-	-	**16.6**	-	-	**8.18**	-	-
YVD-06	YVD-06-140601	06/01/2014	N	SXF0008	0.2	U	-	0.25	U	-	**0.064**	-	-	-	-	-	-	-	-	-	-	-	**2.28**	-	-	**16.7**	-	-	**7.59**	-	-
YVD-06	YVD-D1-140601	06/01/2014	FD	SXF0008	0.2	U	-	0.25	U	-	**0.057**	-	-	-	-	-	-	-	-	-	-	-	**2.30**	-	-	**16.9**	-	-	**7.63**	-	-
YVD-06	YVD-06-140921	09/21/2014	N	SXI0148	0.2	U	-	**0.359**	-	-	**0.18**	-	-	-	-	-	-	-	-	-	-	-	**2.69**	-	-	**17.4**	-	-	**7.98**	-	-
YVD-06	YVD-06-141215	12/15/2014	N	SXL0103	0.2	U	-	0.25	U	-	0.1	U	-	-	-	-	-	-	-	-	-	-	**2.58**	-	-	**16.9**	-	-	**7.47**	J+	MSD, DUP
YVD-06	YVD-06-150316	03/16/2015	N	5904471	0.2	U	-	0.25	UJ	MSD	0.25	UJ	MSD	-	-	-	-	-	-	-	-	-	**2.20**	-	-	**17.0**	-	-	**10**	-	-
YVD-06	YVD-06-150616	06/16/2015	N	59010751	0.2	U	-	0.25	UJ	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**2.20**	J+	MSD	**17.0**	J+	MSD	**7.9**	J-	MSD
YVD-06	YVD-06-150922	09/22/2015	N	59020141	0.2	U	-	0.25	UJ	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**3.10**	-	-	**17.0**	-	-	**7.9**	-	-
YVD-06	YVD-06-151214	12/14/2015	N	59025351	0.2	U	-	**0.57**	J-	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**2.40**	-	-	**18.0**	-	-	**8**	-	-
YVD-06	YVD-06-160307	03/07/2016	N	59029521	0.2	U	-	0.25	UJ	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**2.50**	-	-	**17.0**	-	-	**7.8**	-	-
YVD-06	YVD-06-160620	6/20/2016	N	59037151	0.2	U	-	**0.42**	-	-	0.25	U	-	-	-	-	-	-	-	-	-	-	**2.30**	-	-	**17.0**	-	-	**8.1**	-	-
YVD-06	YVD-06-160929	9/29/2016	N	K1611704	0.10	U	-	0.5	U	-	-	-	-	**0.022**	-	-	-	-	-	-	-	-	**2.26**	-	-	**17.1**	-	-	**8.55**	-	-
YVD-06	YVD-06-161215	12/15/2016	N	K1615126	0.10	U	-	0.5	U	-	-	-	-	**0.010**	-	-	-	-	-	-	-	-	**2.12**	-	-	**17.1**	-	-	**10.2**	-	-
YVD-06	YVD-030617-04	3/6/2017	N	K1702228	0.10	U	-	0.5	U	FBK	-	-	-	**0.014**	-	-	-	-	-	-	-	-	**2.20**	-	-	**17.0**	-	-	**8.38**	-	-
YVD-06	YVD-060617-21	6/6/2017	N	K1705754	0.10	U	-	0.5	U	-	-	-	-	**0.010**	J	-	-	-	-	-	-	-	**2.17**	-	-	**16.3**	-	-	**8.44**	-	-
YVD-06	YVD-092617-17	9/26/2017	N	K1710333	0.10	U	-	0.5	U	-	-	-	-	**0.009**	J	-	-	-	-	-	-	-	**1.97**	-	-	**15.6**	-	-	**9.61**	-	-
YVD-06	YVD-092617-18	9/26/2017	FD	K1710333	0.10	U	-	0.5	U	-	-	-	-	**0.010**	J	-	-	-	-	-	-	-	**2.03**	-	-	**16.1**	-	-	**9.58**	-	-
YVD-06	YVD-120517-17	12/5/2017	N	K1713091	0.10	U	-	0.5	UJ	MSD	-	-	-	**0.021**	-	-	-	-	-	-	-	-	**2.11**	-	-	**17.3**	-	-	**9.87**	-	-
YVD-06	YVD-060318-15	6/3/2018	N	874568	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.36**	-	-	**17.3**	-	-	**7.86**	-	-
YVD-06	YVD-060219-11	6/2/2019	N	991939	0.050	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.20**	-	-	**16.6**	-	-	**6.42**	-	-
YVD-06	YVD-060920-17	6/9/2020	N	009269	0.050	U	-	5.0	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.16**	-	-	**17.6**	-	-	**8.86**	-	-
YVD-06	YVD-060721-19	6/7/2021	N	124105	0.050	U	-	0.50	UJ	MS, RPD	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.28**	-	-	**16.2**	-	-	**6.80**	-	-
YVD-06	YVD-060722-30	6/7/2022	N	K2206237	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	-	-	**-**	-	-	**-**	-	-
YVD-07	YVD-07-130923	09/23/2013	N	SWI0178	-	-	-	**0.395**	-	-	-	-	-	-	-	-	**0.516**	-	-	-	-	-	**5.03**	-	-	**37.7**	-	-	-	-	-
YVD-07	YVD-07-130926	09/26/2013	N	SWI0190	0.2	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**37.4**	-	-
YVD-07	YVD-07-131210	12/10/2013	N	SWL0055	0.2	U	-	0.2	UJ	MSD	-	-	-	-	-	-	-	-	-	0.06	U	-	1.00	U	-	**40.4**	-	-	**50**	-	-
YVD-07	YVD-07-140316	03/16/2014	N	SXC0081	0.2	U	-	0.25	U	-	**0.22**	-	-	-	-	-	-	-	-	-	-	-	**4.45**	-	-	**42.5**	-	-	**69.2**	-	-
YVD-07	YVD-07-140604	06/04/2014	N	SXF0025	0.4	U	-	**0.348**	J-	MSD	**0.69**	-	-	-	-	-	-	-	-	-	-	-	**5.57**	-	-	**44.5**	-	-	**57**	-	-
YVD-07	YVD-07-140922	09/22/2014	N	SXI0158	0.4	U	-	0.25	U	-	**0.2**	-	-	-	-	-	-	-	-	-	-	-	**4.05**	-	-	**42.7**	J+	MSD	**51.8**	-	-
YVD-07	YVD-07-141216	12/16/2014	N	SXL0108	0.4	U	-	0.25	U	-	0.1	U	-	-	-	-	-	-	-	-	-	-	**3.83**	-	-	**40.6**	-	-	**51.2**	-	-
YVD-07	YVD-07-150316	03/16/2015	N	5904541	0.4	U	-	0.25	UJ	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**4.30**	-	-	**50.0**	-	-	**73**	J-	MSD
YVD-07	YVD-D2-150316	03/16/2015	FD	5904541	0.2	U	-	0.25	UJ	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**4.30**	-	-	**48.0**	-	-	**70**	J-	MSD
YVD-07	YVD-07-150616	06/16/2015	N	59010751	0.4	U	-	0.25	UJ	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**4.20**	J+	MSD	**43.0**	J+	MSD	**74**	J-	MSD
YVD-07	YVD-D1-150616	06/16/2015	FD	59010751	0.2	U	-	0.25	UJ	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**4.20**	J+	MSD	**44.0**	J+	MSD	**74**	J-	MSD
YVD-07	YVD-07-150923	09/23/2015	N	59020281	0.4	U	-	-	R	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**4.20**	-	-	**48.0**	-	-	**68**	-	-
YVD-07	YVD-07-151214	12/14/2015	N	59025431	0.4	U	-	-	R	MSD	**0.97**	J	FDP	-	-	-	-	-	-	-	-	-	**4.50**	-	-	**48.0**	-	-	**59**	-	-
YVD-07	YVD-07-160308	03/08/2016	N	59029711	0.4	U	-	0.25	U	-	0.25	U	-	-	-	-	-	-	-	-	-	-	**4.00**	-	-	**42.0**	-	-	**49**	J+	MSD
YVD-07	YVD-07-160621	6/21/2016	N	59037151	0.4	U	-	0.25	U	-	0.25	U	-	-	-	-	-	-	-	-	-	-	**3.50**	-	-	**37.0**	-	-	**31**	-	-
YVD-07	YVD-07-160929	9/29/2016	N	K1611704	0.10	U	-	0.5	U	-	-	-	-	**0.020**	-	-	-	-	-	-	-	-	**3.31**	-	-	**34.0**	-	-	**37.1**	-	-
YVD-07	YVD-07-161213	12/13/2016	N	K1615083	0.10	U	-	0.5	U	-	-	-	-	**0.010**	J	-	-	-	-	-	-	-	**3.59**	-	-	**36.6**	-	-	**64.0**	-	-
YVD-07	YVD-030717-07	3/7/2017	N	K1702324	0.10	UJ	HTQ	0.5	U	-	-	-	-	**0.019**	-	-	-	-	-	-	-	-	**2.83**	-	-	**31.4**	-	-	**25.4**	-	-
YVD-07	YVD-060517-15	6/5/2017	N	K1705754	0.10	U	-	0.5	U	-	-	-	-	**0.004**	J	-	-	-	-	-	-	-	**2.98**	-	-	**32.9**	-	-	**33.5**	-	-
YVD-07	YVD-092617-21	9/26/2017	N	K1710333	0.10	U	-	0.5	U	-	-	-	-	**0.022**	-	-	-	-	-	-	-	-	**3.26**	-	-	**34.0**	-	-	**51.0**	-	-
YVD-07	YVD-120417-11	12/4/2017	N	K1713026	0.10	U	-	0.5	U	-	-	-	-	**0.022**	-	-	-	-	-	-	-	-	**3.56**	-	-	**36.1**	-	-	**56.5**	-	-
YVD-07	YVD-060418-23	6/4/2018	N	874662	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.76**	-	-	**39.4**	-	-	**63.5**	-	-

Table 8
Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P-E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-07	YVD-060319-16	6/3/2019	N	992053	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.76**	-	-	**35.8**	-	-	**27.6**	-	-
YVD-07	YVD-060920-27	6/9/2020	N	009269	0.050	U	-	5.0	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.27**	-	-	**41.8**	-	-	**62.9**	-	-
YVD-07	YVD-060821-34	6/8/2021	N	124212	0.050	U	-	0.50	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.28**	-	-	**37.6**	-	-	**40.8**	-	-
YVD-07	YVD-060622-21	6/6/2022	N	K2206160	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	-	-	**-**	-	-	**-**	-	-
YVD-07	YVD-060622-22	6/6/2022	FD	K2206160	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	-	-	**-**	-	-	**-**	-	-
YVD-08	YVD-08-130919	09/19/2013	N	SWI0138	2	U	-	**0.935**	J+	FBK	-	-	-	-	-	-	0.1	U	-	-	-	-	**6.03**	-	-	**88.3**	-	-	**105**	-	-
YVD-08	YVD-08-131211	12/11/2013	N	SWL0063	2	U	-	0.75	U	ERL	-	-	-	-	-	-	-	-	-	**1.46**	-	-	**7.55**	-	-	**82.2**	-	-	**273**	J-	MSD
YVD-08	YVD-08-140317	03/17/2014	N	SXC0095	2	U	-	**0.702**	-	-	**0.13**	-	-	-	-	-	-	-	-	-	-	-	**5.30**	-	-	**75.1**	-	-	**173**	J-	MSD
YVD-08	YVD-08-140602	06/02/2014	N	SXF0017	0.8	U	-	**1.12**	-	-	**2.7**	-	-	-	-	-	-	-	-	-	-	-	**11.20**	-	-	**78.3**	-	-	**175**	J-	MSD
YVD-08	YVD-08-140923	09/23/2014	N	SXI0173	1	U	-	**0.867**	J+	MSD	**0.35**	-	-	-	-	-	-	-	-	-	-	-	**5.87**	-	-	**76.9**	-	-	**107**	-	-
YVD-08	YVD-08-141216	12/16/2014	N	SXL0108	1	U	-	**0.369**	-	-	**0.34**	-	-	-	-	-	-	-	-	-	-	-	**5.92**	-	-	**77.2**	-	-	**140**	-	-
YVD-08	YVD-08-150317	03/17/2015	N	5904541	1	U	-	**0.39**	J-	MSD	**0.67**	-	-	-	-	-	-	-	-	-	-	-	**5.90**	-	-	**77.0**	-	-	**130**	J-	MSD
YVD-08	YVD-D3-150317	03/17/2015	FD	5904541	0.2	U	-	0.25	UJ	MSD	**0.49**	-	-	-	-	-	-	-	-	-	-	-	**5.70**	-	-	**76.0**	-	-	**150**	J-	MSD
YVD-08	YVD-08-150617	06/17/2015	N	59010961	1	U	-	**0.26**	J-	MSD, FDP	**0.53**	-	-	-	-	-	-	-	-	-	-	-	**6.00**	J+	MSD	**82.0**	J+	MSD	**140**	-	-
YVD-08	YVD-D3-150617	06/17/2015	FD	59010961	0.2	U	-	**0.86**	J-	MSD, FDP	**0.39**	-	-	-	-	-	-	-	-	-	-	-	**5.70**	J+	MSD	**77.0**	J+	MSD	**170**	-	-
YVD-08	YVD-08-150924	09/24/2015	N	59020391	1	U	-	0.25	UJ	MSD	**0.31**	-	-	-	-	-	-	-	-	-	-	-	**5.60**	-	-	**82.0**	-	-	**170**	J-	MSD
YVD-08	YVD-08-151215	12/15/2015	N	59025501	1	U	-	-	R	MSD	**0.33**	J-	MSD	-	-	-	-	-	-	-	-	-	**6.20**	-	-	**85.0**	-	-	**190**	-	-
YVD-08	YVD-D3-151215	12/15/2015	FD	59025501	0.2	U	-	-	R	MSD	**0.27**	J-	MSD	-	-	-	-	-	-	-	-	-	**6.20**	-	-	**85.0**	-	-	**180**	-	-
YVD-08	YVD-08-160310	03/10/2016	N	59029941	1	U	-	0.25	UJ	FDP, MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**5.60**	-	-	**87.0**	-	-	**210**	J	DUP
YVD-08	YVD-08-160622	6/22/2016	N	59037271	1	U	-	-	R	MSD	**0.31**	-	-	-	-	-	-	-	-	-	-	-	**5.90**	-	-	**87.0**	-	-	**200**	-	-
YVD-08	YVD-D3-160622	6/22/2016	FD	59037271	0.2	U	-	-	R	MSD	**0.28**	-	-	-	-	-	-	-	-	-	-	-	**6.00**	-	-	**88.0**	-	-	**200**	-	-
YVD-08	YVD-08-160927	9/27/2016	N	K1611565	0.10	U	-	-	R	MSD	-	-	-	**0.049**	-	-	-	-	-	-	-	-	**4.95**	-	-	**84.7**	-	-	**193**	-	-
YVD-08	YVD-08-161213	12/13/2016	N	K1615045	0.10	U	-	0.5	U	-	-	-	-	**0.058**	-	-	-	-	-	-	-	-	**5.10**	-	-	**84.5**	-	-	**182**	-	-
YVD-08	YVD-030917-24	3/9/2017	N	K1702448	0.10	U	-	0.5	U	-	-	-	-	**0.018**	-	-	-	-	-	-	-	-	**4.95**	-	-	**83.4**	-	-	**203**	-	-
YVD-08	YVD-060717-29	6/7/2017	N	K1705833	0.10	U	-	0.5	U	-	-	-	-	**0.025**	-	-	-	-	-	-	-	-	**5.13**	-	-	**92.1**	-	-	**194**	-	-
YVD-08	YVD-092617-19	9/26/2017	N	K1710333	0.10	U	-	0.5	U	-	-	-	-	**0.01**	-	-	-	-	-	-	-	-	**5.12**	-	-	**89.3**	-	-	**213**	-	-
YVD-08	YVD-120517-23	12/5/2017	N	K1713157	0.10	U	-	0.5	U	-	-	-	-	**0.013**	-	-	-	-	-	-	-	-	**5.23**	-	-	**93.2**	-	-	**184**	-	-
YVD-08	YVD-031918-15	3/19/2018	N	870634	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**5.40**	-	-	**90.5**	-	-	**183**	-	-
YVD-08	YVD-060518-31	6/5/2018	N	874860	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**5.55**	-	-	**98.0**	-	-	**197**	-	-
YVD-08	YVD-090918-04	9/9/2018	N	880601	0.050	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**5.70**	-	-	**99.5**	-	-	**195**	-	-
YVD-08	YVD-121118-19	12/11/2018	N	884939	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**6.00**	-	-	**98.5**	-	-	**207**	-	-
YVD-08	YVD-031719-03	3/17/2019	N	988239	0.050	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**5.50**	-	-	**96.0**	-	-	**203**	-	-
YVD-08	YVD-060319-21	6/3/2019	N	992053	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**5.55**	-	-	**97.5**	-	-	**190**	-	-
YVD-08	YVD-090919-02	9/9/2019	N	998357	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**5.45**	-	-	**91.5**	-	-	**184**	-	-
YVD-08	YVD-120919-02	12/9/2019	N	902276	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**5.55**	-	-	**96.5**	J	MSD	**177**	-	-
YVD-08	YVD-120919-04	12/9/2019	FD	902276	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**5.55**	-	-	**96.0**	J	MSD	**173**	-	-
YVD-08	YVD-033120-17	3/31/2020	N	006260	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**5.35**	-	-	**99.0**	-	-	**184**	-	-
YVD-08	YVD-060920-23	6/9/2020	N	009269	0.050	U	-	5.0	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**5.50**	-	-	**106**	-	-	**176**	-	-
YVD-08	YVD-092120-11	9/21/2020	N	013896	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**5.60**	-	-	**104**	-	-	**179**	-	-
YVD-08	YVD-120720-11	12/7/2020	N	017035	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**6.05**	-	-	**104**	-	-	**174**	-	-
YVD-08	YVD-030121-07	3/1/2021	N	119931	0.050	U	-	5.0	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**5.55**	-	-	**102**	-	-	**177**	-	-
YVD-08	YVD-060821-28	6/8/2021	N	124212	0.050	U	-	0.50	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**5.45**	-	-	**102**	-	-	**179**	-	-
YVD-08	YVD-121521-20	12/15/2021	N	K2114550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-08	YVD-031522-12	3/15/2022	N	K2202727	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 8
Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P-E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-08	YVD-060722-27	6/7/2022	N	K2206237	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-09	YVD-09-130919	09/19/2013	N	SWI0138	2	U	-	-	R	FBK	-	-	-	-	-	-	-	R	FBK	-	-	-	**8.21**	-	-	**189**	-	-	**236**	-	-
YVD-09	YVD-09-131212	12/12/2013	N	SWL0078	2	U	-	0.661	U	ERL	-	-	-	-	-	-	-	-	-	**0.647**	-	-	**9.21**	-	-	**176**	-	-	**193**	-	-
YVD-09	YVD-09-140319	03/19/2014	N	SXC0107	2	U	-	**0.653**	J-	MSD	**0.53**	-	-	-	-	-	-	-	-	-	-	-	**9.33**	-	-	**173**	-	-	**214**	-	-
YVD-09	YVD-09-140603	06/03/2014	N	SXF0025	2	U	-	**0.613**	J-	MSD	**0.72**	-	-	-	-	-	-	-	-	-	-	-	**10.10**	-	-	**193**	-	-	**214**	-	-
YVD-09	YVD-09-140924	09/24/2014	N	SXI0173	2	U	-	**0.502**	J+	MSD	**0.32**	J+	FBK	-	-	-	-	-	-	-	-	-	**8.88**	-	-	**203**	-	-	**166**	-	-
YVD-09	YVD-09-141217	12/17/2014	N	SXL0121	2	U	-	0.25	UJ	MSD	**1.3**	-	-	-	-	-	-	-	-	-	-	-	**12.90**	-	-	**187**	-	-	**223**	-	-
YVD-09	YVD-09-150318	03/18/2015	N	5904651	2	U	-	0.25	UJ	MSD	**0.38**	-	-	-	-	-	-	-	-	-	-	-	**9.30**	J-	MSD	**190**	-	-	**190**	-	-
YVD-09	YVD-09-150617	06/17/2015	N	59010961	2	U	-	**0.37**	J-	MSD	**0.36**	-	-	-	-	-	-	-	-	-	-	-	**9.80**	J+	MSD	**190**	J+	MSD	**230**	-	-
YVD-09	YVD-09-150923	09/23/2015	N	59020391	0.2	U	-	**0.26**	J-	MSD	**0.27**	-	-	-	-	-	-	-	-	-	-	-	**9.60**	-	-	**180**	-	-	**270**	J-	MSD
YVD-09	YVD-09-151215	12/15/2015	N	59025501	2	U	-	-	R	MSD	**0.25**	J-	MSD	-	-	-	-	-	-	-	-	-	**9.60**	-	-	**190**	-	-	**250**	-	-
YVD-09	YVD-09-160310	03/10/2016	N	59029941	2	U	-	0.25	UJ	FDP, MSD	**0.33**	-	-	-	-	-	-	-	-	-	-	-	**9.20**	-	-	**190**	-	-	**250**	J	DUP
YVD-09	YVD-09-160622	6/22/2016	N	59037271	2	U	-	-	R	MSD	**0.29**	-	-	-	-	-	-	-	-	-	-	-	**8.90**	-	-	**190**	-	-	**260**	-	-
YVD-09	YVD-09-160929	9/29/2016	N	K1611704	0.10	U	-	0.5	U	-	-	-	-	**0.016**	-	-	-	-	-	-	-	-	**7.62**	-	-	**184**	-	-	**243**	-	-
YVD-09	YVD-09-161213	12/13/2016	N	K1615045	0.10	U	-	0.5	U	-	-	-	-	**0.048**	-	-	-	-	-	-	-	-	**8.42**	-	-	**185**	-	-	**238**	-	-
YVD-09	YVD-D2-161213	12/13/2016	FD	K1615045	0.10	U	-	0.5	U	-	-	-	-	**0.078**	-	-	-	-	-	-	-	-	**8.04**	-	-	**181**	-	-	**240**	-	-
YVD-09	YVD-031317-35	3/13/2017	N	K1702489	**0.04**	J	-	0.5	U	-	-	-	-	**0.025**	-	-	-	-	-	-	-	-	**7.78**	-	-	**185**	-	-	**225**	-	-
YVD-09	YVD-060517-08	6/5/2017	N	K1705702	0.10	U	-	0.5	U	-	-	-	-	**0.007**	J	-	-	-	-	-	-	-	**6.98**	-	-	**163**	-	-	**237**	-	-
YVD-09	YVD-092617-29	9/26/2017	N	K1710381	0.10	U	-	0.5	U	-	-	-	-	**0.029**	-	-	-	-	-	-	-	-	**8.07**	-	-	**175**	-	-	**223**	-	-
YVD-09	YVD-092617-30	9/26/2017	FD	K1710381	0.10	U	-	0.5	U	-	-	-	-	**0.039**	-	-	-	-	-	-	-	-	**8.11**	-	-	**176**	-	-	**224**	-	-
YVD-09	YVD-120517-21	12/5/2017	N	K1713091	0.10	U	-	0.5	UJ	MSD	-	-	-	**0.009**	J	-	-	-	-	-	-	-	**7.27**	-	-	**174**	-	-	**211**	-	-
YVD-09	YVD-031918-18	3/19/2018	N	870634	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**7.80**	-	-	**166**	-	-	**180**	-	-
YVD-09	YVD-060318-13	6/3/2018	N	874568	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**8.35**	-	-	**182**	-	-	**182**	-	-
YVD-09	YVD-090918-06	9/9/2018	N	880601	0.050	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**8.10**	-	-	**174**	-	-	**172**	-	-
YVD-09	YVD-121118-15	12/11/2018	N	884939	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**8.60**	-	-	**172**	-	-	**166**	-	-
YVD-09	YVD-121118-17	12/11/2018	FD	884939	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**8.75**	-	-	**175**	-	-	**170**	-	-
YVD-09	YVD-031719-05	3/17/2019	N	988239	0.050	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**8.05**	-	-	**166**	-	-	**162**	-	-
YVD-09	YVD-060319-15	6/3/2019	N	992053	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**8.00**	-	-	**166**	-	-	**146**	-	-
YVD-09	YVD-090919-04	9/9/2019	N	998357	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**8.20**	-	-	**160**	-	-	**148**	-	-
YVD-09	YVD-120919-06	12/9/2019	N	902276	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U		**8.40**	-	-	**166**	J	MSD	**143**	-	-
YVD-09	YVD-033020-05	3/30/2020	N	006241	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**7.95**	-	-	**163**	-	-	**150**	-	-
YVD-09	YVD-060920-24	6/9/2020	N	009269	0.050	U	-	5.0	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**7.90**	-	-	**167**	-	-	**158**	-	-
YVD-09	YVD-092120-16	9/21/2020	N	013896	0.050	U	-	2.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**7.85**	-	-	**164**	-	-	**151**	-	-
YVD-09	YVD-120720-13	12/7/2020	N	017035	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**8.65**	-	-	**164**	-	-	**159**	-	-
YVD-09	YVD-030121-05	3/1/2021	N	119931	0.050	U	-	5.0	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**8.05**	-	-	**161**	-	-	**152**	-	-
YVD-09	YVD-060721-18	6/7/2021	N	124105	0.050	U	-	5.0	UJ	MS, RPD	-	-	-	-	-	-	-	-	-	0.070	U	-	**8.15**	-	-	**157**	-	-	**135**	-	-
YVD-09	YVD-121421-09	12/14/2021	N	K2114499	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-09	YVD-031522-14	3/15/2022	N	K2202727	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-09	YVD-060622-12	6/6/2022	N	K2206160	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-10	YVD-10-130917	09/17/2013	N	SWI0123	2	U	-	0.25	U	-	-	-	-	-	-	-	**0.148**	-	-	-	-	-	**3.28**	-	-	**104**	-	-	**199**	-	-
YVD-10	YVD-10-131212	12/12/2013	N	SWL0078	2	U	-	0.6495	U	ERL	-	-	-	-	-	-	-	-	-	**1.4**	-	-	**4.49**	-	-	**102**	-	-	**174**	-	-
YVD-10	YVD-10-140319	03/19/2014	N	SXC0107	2	U	-	**0.507**	J-	MSD	**0.77**	-	-	-	-	-	-	-	-	-	-	-	**3.93**	-	-	**96.8**	-	-	**163**	-	-
YVD-10	YVD-10-140603	06/03/2014	N	SXF0025	2	U	-	**0.577**	J-	MSD	**0.8**	-	-	-	-	-	-	-	-	-	-	-	**4.07**	-	-	**103**	-	-	**188**	-	-
YVD-10	YVD-10-140924	09/24/2014	N	SXI0173	2	U	-	**0.443**	J+	MSD	**0.48**	J+	FBK	-	-	-	-	-	-	-	-	-	**3.86**	-	-	**116**	-	-	**217**	-	-
YVD-10	YVD-10-141217	12/17/2014	N	SXL0144	2	U	-	-	R	MSD	**0.69**	J-	MSD	-	-	-	-	-	-	-	-	-	**3.88**	-	-	**110**	-	-	**180**	-	-
YVD-10	YVD-10-150318	03/18/2015	N	5904651	2	U	-	0.25	UJ	MSD	**0.42**	-	-	-	-	-	-	-	-	-	-	-	**4.00**	J-	MSD	**130**	-	-	**370**	-	-

Table 8
Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P-E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-10	YVD-10-150617	06/17/2015	N	59010961	2	U	-	**0.44**	J-	MSD	**0.72**	-	-	-	-	-	-	-	-	-	-	-	**4.60**	J+	MSD	**130**	J+	MSD	**110**	-	-
YVD-10	YVD-10-150923	09/23/2015	N	59020391	2	U	-	0.25	UJ	MSD	**0.56**	-	-	-	-	-	-	-	-	-	-	-	**4.30**	-	-	**120**	-	-	**370**	J-	MSD
YVD-10	YVD-10-151214	12/14/2015	N	59025351	2	U	-	0.25	UJ	MSD	**0.58**	-	-	-	-	-	-	-	-	-	-	-	**4.30**	-	-	**120**	-	-	**360**	-	-
YVD-10	YVD-10-160309	03/09/2016	N	59029711	2	U	-	-	R	MSD	**0.42**	-	-	-	-	-	-	-	-	-	-	-	**4.10**	-	-	**120**	-	-	**280**	J+	MSD
YVD-10	YVD-10-160621	6/21/2016	N	59037271	2	U	-	-	R	MSD	**0.71**	-	-	-	-	-	-	-	-	-	-	-	**4.50**	-	-	**110**	-	-	**240**	-	-
YVD-10	YVD-10-160929	9/29/2016	N	K1611698	0.10	U	-	-	R	MSD	-	-	-	**0.028**	-	-	-	-	-	-	-	-	**2.48**	-	-	**114**	-	-	**223**	-	-
YVD-10	YVD-10-161212	12/12/2016	N	K1615029	0.10	U	-	0.5	U	-	-	-	-	**0.074**	-	-	-	-	-	-	-	-	**2.68**	-	-	**118**	-	-	**191**	-	-
YVD-10	YVD-030917-27	3/9/2017	N	K1702448	0.10	U	-	0.5	U	-	-	-	-	**0.066**	-	-	-	-	-	-	-	-	**2.89**	-	-	**133**	-	-	**799**	-	-
YVD-10	YVD-060617-22	6/6/2017	N	K1705754	0.10	U	-	0.5	U	-	-	-	-	**0.036**	-	-	-	-	-	-	-	-	**2.57**	-	-	**119**	-	-	**368**	-	-
YVD-10	YVD-092617-31	9/26/2017	N	K1710381	0.10	U	-	0.5	U	-	-	-	-	**0.011**	-	-	-	-	-	-	-	-	**2.56**	-	-	**111**	-	-	**265**	-	-
YVD-10	YVD-120517-30	12/5/2017	N	K1713091	0.10	U	-	0.5	UJ	MSD	-	-	-	**0.023**	-	-	-	-	-	-	-	-	**2.37**	-	-	**114**	-	-	**224**	-	-
YVD-10	YVD-031818-06	3/18/2018	N	870610	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.60**	-	-	**123**	-	-	**202**	-	-
YVD-10	YVD-060318-06	6/3/2018	N	874568	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.93**	-	-	**118**	-	-	**208**	-	-
YVD-10	YVD-090918-13	9/9/2018	N	880601	0.050	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.58**	-	-	**114**	-	-	**238**	-	-
YVD-10	YVD-121018-08	12/10/2018	N	884857	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.64**	-	-	**112**	-	-	**196**	-	-
YVD-10	YVD-031819-16	3/18/2019	N	988273	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	**0.07**	-	-	**2.62**	-	-	**108**	-	-	**196**	-	-
YVD-10	YVD-060319-18	6/3/2019	N	992053	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.56**	-	-	**106**	-	-	**220**	-	-
YVD-10	YVD-091019-20	9/10/2019	N	998438	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.49**	-	-	**104**	-	-	**165**	-	-
YVD-10	YVD-121019-21	12/10/2019	N	902321	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.94**	-	-	**102**	-	-	**199**	-	-
YVD-10	YVD-033020-08	3/30/2020	N	006241	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.64**	-	-	**100**	-	-	**183**	-	-
YVD-10	YVD-060920-12	6/9/2020	N	009269	0.050	U	-	5.0	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.71**	-	-	**108**	-	-	**224**	-	-
YVD-10	YVD-092020-08	9/20/2020	N	013864	0.050	U	-	0.5	U	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.73**	-	-	**102**	-	-	**229**	-	-
YVD-10	YVD-120720-12	12/7/2020	N	017035	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.24**	-	-	**106**	-	-	**288**	-	-
YVD-10	YVD-030121-12	3/1/2021	N	119931	0.050	U	-	5.0	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.34**	-	-	**134**	-	-	**896**	-	-
YVD-10	YVD-060621-07	6/6/2021	N	124053	0.050	U	-	5.0	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.80**	-	-	**106**	-	-	**219**	-	-
YVD-10	YVD-121421-06	12/14/2021	N	K2114499	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-10	YVD-031422-06	3/14/2022	N	K2202633	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-10	YVD-060522-06	6/5/2022	N	K2206116	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-11	YVD-11-130923	09/23/2013	N	SWI0178	-	-	-	0.25	U	-	-	-	-	-	-	-	0.1	UJ	FDP	-	-	-	**5.44**	J	FDP	**23.2**	-	-	-	-	-
YVD-11	YVD-D2-130923	09/23/2013	FD	SWI0178	-	-	-	0.25	U	-	-	-	-	-	-	-	**0.753**	J	FDP	-	-	-	**3.60**	J	FDP	**23.0**	-	-	-	-	-
YVD-11	YVD-11-130926	09/26/2013	N	SWI0190	2	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**207**	-	-
YVD-11	YVD-D3-130926	09/26/2013	FD	SWI0190	2	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**228**	-	-
YVD-11	YVD-11-131212	12/12/2013	N	SWL0073	2	U	-	0.2	UJ	MSD	-	-	-	-	-	-	-	-	-	**0.245**	-	-	**3.37**	-	-	**23.2**	-	-	**208**	-	-
YVD-11	YVD-11-140318	03/18/2014	N	SXC0107	2	U	-	**0.503**	J-	MSD	**0.17**	-	-	-	-	-	-	-	-	-	-	-	**3.15**	-	-	**22.2**	-	-	**193**	-	-
YVD-11	YVD-11-140603	06/03/2014	N	SXF0017	2	U	-	**0.564**	-	-	**0.84**	-	-	-	-	-	-	-	-	-	-	-	**5.38**	-	-	**26.1**	-	-	**203**	J-	MSD
YVD-11	YVD-11-140924	09/24/2014	N	SXI0173	1	U	-	**0.453**	J+	MSD	**0.17**	J+	FBK	-	-	-	-	-	-	-	-	-	**3.86**	-	-	**25.6**	-	-	**159**	-	-
YVD-11	YVD-11-141217	12/17/2014	N	SXL0121	2	U	-	0.25	UJ	MSD	**0.46**	-	-	-	-	-	-	-	-	-	-	-	**4.77**	-	-	**25.6**	-	-	**158**	-	-
YVD-11	YVD-11-150317	03/17/2015	N	5904651	2	U	-	0.25	UJ	MSD	**0.3**	-	-	-	-	-	-	-	-	-	-	-	**4.30**	J-	MSD	**26.0**	-	-	**150**	-	-
YVD-11	YVD-11-150616	06/16/2015	N	59010961	2	U	-	**0.31**	J-	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**3.20**	J+	MSD	**27.0**	J+	MSD	**140**	-	-
YVD-11	YVD-11-150923	09/23/2015	N	59020281	2	U	-	-	R	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**3.40**	-	-	**25.0**	-	-	**130**	-	-
YVD-11	YVD-11-151215	12/15/2015	N	59025431	2	U	-	-	R	MSD	**0.59**	J	FDP	-	-	-	-	-	-	-	-	-	**5.20**	-	-	**25.0**	-	-	**140**	-	-
YVD-11	YVD-D2-151215	12/15/2015	FD	59025431	0.2	U	-	-	R	MSD	**1.5**	J	FDP	-	-	-	-	-	-	-	-	-	**4.90**	-	-	**25.0**	-	-	**130**	-	-
YVD-11	YVD-11-160309	03/09/2016	N	59029711	2	U	-	-	R	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**3.30**	-	-	**25.0**	-	-	**140**	J+	MSD
YVD-11	YVD-11-160621	6/21/2016	N	59037151	2	U	-	0.25	U	-	0.25	U	-	-	-	-	-	-	-	-	-	-	**3.50**	-	-	**27.0**	-	-	**130**	-	-
YVD-11	YVD-11-160927	9/27/2016	N	K1611629	0.10	U	-	0.5	U	-	-	-	-	**0.071**	-	-	-	-	-	-	-	-	**3.13**	-	-	**26.1**	-	-	**100**	-	-
YVD-11	YVD-11-161214	12/14/2016	N	K1615126	0.10	U	-	0.5	U	-	-	-	-	**0.421**	-	-	-	-	-	-	-	-	**4.82**	-	-	**25.6**	-	-	**104**	-	-
YVD-11	YVD-031317-37	3/13/2017	N	K1702489	**0.06**	J	-	0.5	U	-	-	-	-	**0.016**	-	-	-	-	-	-	-	-	**3.02**	-	-	**25.5**	-	-	**99.8**	-	-
YVD-11	YVD-060517-10	6/5/2017	N	K1705702	0.10	U	-	0.5	U	-	-	-	-	**0.029**	-	-	-	-	-	-	-	-	**2.98**	-	-	**24.9**	-	-	**133**	-	-

Table 8
Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P-E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-11	YVD-092617-26	9/26/2017	N	K1710381	0.10	UJ	HTQ	0.5	U	-	-	-	-	**0.006**	J	-	-	-	-	-	-	-	**3.24**	-	-	**28.8**	-	-	**219**	-	-
YVD-11	YVD-120417-06	12/4/2017	N	K1713026	0.10	U	-	0.5	U	-	-	-	-	0.015	U	MBK	-	-	-	-	-	-	**2.78**	-	-	**25.8**	-	-	**124**	-	-
YVD-11	YVD-031918-12	3/19/2018	N	870634	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.98**	-	-	**26.0**	-	-	**103**	-	-
YVD-11	YVD-031918-14	3/19/2018	FD	870634	0.050	U	-	-	-	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.94**	-	-	**25.8**	-	-	**100**	-	-
YVD-11	YVD-060418-14	6/4/2018	N	874662	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.26**	-	-	**28.4**	-	-	**91.2**	-	-
YVD-11	YVD-060418-16	6/4/2018	FD	874662	0.050	U	-	**0.6**	J	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.28**	-	-	**28.9**	-	-	**90.0**	-	-
YVD-11	YVD-090918-05	9/9/2018	N	880601	0.050	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.05**	-	-	**28.2**	-	-	**90.6**	-	-
YVD-11	YVD-121018-10	12/10/2018	N	884857	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.88**	-	-	**27.4**	-	-	**75.4**	-	-
YVD-11	YVD-031819-18	3/18/2019	N	988273	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.76**	-	-	**26.2**	-	-	**60.4**	-	-
YVD-11	YVD-060219-02	6/2/2019	N	991939	0.050	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.60**	-	-	**25.4**	-	-	**58.2**	-	-
YVD-11	YVD-060219-04	6/2/2019	FD	991939	0.050	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.68**	-	-	**25.6**	-	-	**58.4**	-	-
YVD-11	YVD-090919-05	9/9/2019	N	998357	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.66**	-	-	**27.2**	-	-	**60.4**	-	-
YVD-11	YVD-120919-13	12/9/2019	N	902276	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.76**	-	-	**29.6**	J	MSD	**57.2**	-	-
YVD-11	YVD-033020-10	3/30/2020	N	006241	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.68**	-	-	**29.8**	-	-	**55.5**	-	-
YVD-11	YVD-061020-31	6/10/2020	N	009361	0.050	U	-	0.5	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.64**	-	-	**31.0**	-	-	**48.8**	-	-
YVD-11	YVD-092120-20	9/21/2020	N	013896	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.70**	-	-	**33.4**	-	-	**60.3**	-	-
YVD-11	YVD-120720-10	12/7/2020	N	017035	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.05**	-	-	**36.4**	-	-	**52.8**	-	-
YVD-11	YVD-030121-06	3/1/2021	N	119931	0.050	U	-	5.0	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.94**	-	-	**37.6**	-	-	**56.0**	-	-
YVD-11	YVD-060821-23	6/8/2021	N	124212	0.050	U	-	0.50	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.80**	-	-	**35.6**	-	-	**36.0**	-	-
YVD-11	YVD-121421-05	12/14/2021	N	K2114499	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-11	YVD-031522-19	3/15/2022	N	K2202727	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-11	YVD-060622-18	6/6/2022	N	K2206160	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-12	YVD-12-130919	09/19/2013	N	SWI0142	-	-	-	-	R	FBK	-	-	-	-	-	-	**0.356**	J+	FBK	-	-	-	**3.14**	-	-	**77.3**	-	-	**245**	-	-
YVD-12	YVD-12-130925	09/25/2013	N	SWI0175	2	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-12	YVD-12-131211	12/11/2013	N	SWL0073	2	U	-	-	R	MSD, FBK	-	-	-	-	-	-	-	-	-	**0.218**	-	-	**3.63**	-	-	**73.2**	-	-	**262**	-	-
YVD-12	YVD-12-140318	03/18/2014	N	SXC0095	2	U	-	**0.564**	-	-	**0.22**	-	-	-	-	-	-	-	-	-	-	-	**3.27**	-	-	**73.4**	-	-	**236**	J-	MSD
YVD-12	YVD-12-140603	06/03/2014	N	SXF0017	0.2	U	-	**0.415**	-	-	**0.28**	J+	FBK	-	-	-	-	-	-	-	-	-	**2.96**	-	-	**70.7**	-	-	**21.3**	J-	MSD
YVD-12	YVD-12-140922	09/22/2014	N	SXI0148	2	U	-	**0.669**	-	-	**0.25**	-	-	-	-	-	-	-	-	-	-	-	**3.13**	-	-	**77.9**	-	-	**200**	-	-
YVD-12	YVD-D2-140922	09/22/2014	FD	SXI0148	0.8	U	-	**0.653**	-	-	**0.2**	-	-	-	-	-	-	-	-	-	-	-	**3.00**	-	-	**77.8**	-	-	**200**	-	-
YVD-12	YVD-12-141216	12/16/2014	N	SXL0121	2	U	-	0.25	UJ	MSD	**0.25**	-	-	-	-	-	-	-	-	-	-	-	**3.23**	-	-	**71.8**	-	-	**228**	-	-
YVD-12	YVD-12-150317	03/17/2015	N	5904541	2	U	-	**0.56**	J-	MSD	**0.31**	-	-	-	-	-	-	-	-	-	-	-	**3.60**	-	-	**73.0**	-	-	**190**	J-	MSD
YVD-12	YVD-12-150617	06/17/2015	N	59010961	2	U	-	**0.35**	J-	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**2.60**	J+	MSD	**83.0**	J+	MSD	**180**	-	-
YVD-12	YVD-12-150924	09/24/2015	N	59020391	2	U	-	0.25	UJ	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**3.50**	-	-	**73.0**	-	-	**210**	J-	MSD
YVD-12	YVD-12-151216	12/16/2015	N	59025501	2	U	-	**0.58**	J-	MSD	0.25	UJ	MSD	-	-	-	-	-	-	-	-	-	**3.10**	-	-	**74.0**	-	-	**180**	-	-
YVD-12	YVD-12-160309	03/09/2016	N	59029941	2	U	-	0.25	UJ	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**2.60**	-	-	**73.0**	-	-	**170**	J	DUP
YVD-12	YVD-D3-160309	03/09/2016	FD	59029941	0.2	U	-	0.25	UJ	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**2.50**	-	-	**72.0**	-	-	**180**	J	DUP
YVD-12	YVD-12-160622	6/22/2016	N	59037271	2	U	-	-	R	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**2.90**	-	-	**72.0**	-	-	**180**	-	-
YVD-12	YVD-12-160929	9/29/2016	N	K1611704	0.10	U	-	0.5	U	-	-	-	-	**0.026**	-	-	-	-	-	-	-	-	**2.28**	-	-	**67.7**	-	-	**158**	-	-
YVD-12	YVD-12-161213	12/13/2016	N	K1615083	0.10	U	-	0.5	U	-	-	-	-	**0.018**	-	-	-	-	-	-	-	-	**2.29**	-	-	**67.9**	-	-	**150**	-	-
YVD-12	YVD-030917-20	3/9/2017	N	K1702404	0.10	U	-	0.5	UJ	MSD	-	-	-	**0.008**	J	-	-	-	-	-	-	-	**2.27**	-	-	**67.4**	-	-	**227**	-	-
YVD-12	YVD-060617-25	6/6/2017	N	K1705833	0.10	U	-	0.5	U	-	-	-	-	**0.010**	J	-	-	-	-	-	-	-	**2.24**	-	-	**66.5**	-	-	**155**	-	-
YVD-12	YVD-092517-15	9/25/2017	N	K1710333	0.10	U	-	0.5	U	-	-	-	-	0.010	U	-	-	-	-	-	-	-	**2.27**	-	-	**64.4**	-	-	**177**	-	-
YVD-12	YVD-120417-03	12/4/2017	N	K1713026	0.10	U	-	0.5	U	-	-	-	-	0.013	U	MBK	-	-	-	-	-	-	**2.06**	-	-	**70.8**	-	-	**169**	-	-
YVD-12	YVD-031918-13	3/19/2018	N	870610	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.30**	-	-	**70.5**	-	-	**167**	-	-
YVD-12	YVD-060318-11	6/3/2018	N	874568	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.58**	-	-	**68.0**	-	-	**171**	-	-
YVD-12	YVD-090918-16	9/9/2018	N	880601	0.050	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.52**	-	-	**67.0**	-	-	**180**	-	-
YVD-12	YVD-121018-13	12/10/2018	N	884857	0.050	U	-	10	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.52**	-	-	**69.5**	-	-	**170**	-	-

Table 8
Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P-E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-12	YVD-031719-07	3/17/2019	N	988239	0.050	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.46**	-	-	**70.5**	-	-	**188**	-	-
YVD-12	YVD-060319-27	6/3/2019	N	992053	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.40**	-	-	**66.5**	-	-	**188**	-	-
YVD-12	YVD-090919-16	9/9/2019	N	998357	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.48**	-	-	**60.5**	-	-	**172**	-	-
YVD-12	YVD-120919-12	12/9/2019	N	902276	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.48**	-	-	**67.0**	J	MSD	**176**	-	-
YVD-12	YVD-033020-11	3/30/2020	N	006241	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.44**	-	-	**63.0**	-	-	**170**	-	-
YVD-12	YVD-060920-22	6/9/2020	N	009269	0.050	U	-	5.0	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.50**	-	-	**71.5**	-	-	**179**	-	-
YVD-12	YVD-092120-18	9/21/2020	N	013896	0.050	U	-	2.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.38**	-	-	**60.5**	-	-	**168**	-	-
YVD-12	YVD-120820-19	12/8/2020	N	017137	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.59**	-	-	**62.0**	-	-	**174**	-	-
YVD-12	YVD-030221-19	3/2/2021	N	120034	0.050	U	-	5.0	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.44**	-	-	**59.5**	-	-	**168**	-	-
YVD-12	YVD-060821-25	6/8/2021	N	124212	0.050	U	-	0.50	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**2.41**	-	-	**60.0**	-	-	**176**	-	-
YVD-12	YVD-121521-18	12/15/2021	N	K2114550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-12	YVD-031522-21	3/15/2022	N	K2202727	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-12	YVD-060622-20	6/6/2022	N	K2206160	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-13	YVD-13-130919	09/19/2013	N	SWI0138	2	U	-	-	R	FBK	-	-	-	-	-	-	-	R	FBK	-	-	-	**4.30**	-	-	**114**	-	-	**365**	-	-
YVD-13	YVD-13-131211	12/11/2013	N	SWL0073	2	U	-	0.2	UJ	MSD	-	-	-	-	-	-	-	-	-	**0.11**	-	-	**4.16**	-	-	**110**	-	-	**278**	-	-
YVD-13	YVD-13-140318	03/18/2014	N	SXC0095	2	U	-	**0.613**	-	-	**0.17**	-	-	-	-	-	-	-	-	-	-	-	**4.27**	-	-	**106**	-	-	**312**	J-	MSD
YVD-13	YVD-13-140603	06/03/2014	N	SXF0017	0.8	U	-	**0.727**	-	-	**0.078**	J+	FBK	-	-	-	-	-	-	-	-	-	**3.70**	-	-	**113**	-	-	**151**	J-	MSD
YVD-13	YVD-13-140923	09/23/2014	N	SXI0173	2	U	-	**9.13**	J+	MSD	0.05	U	-	-	-	-	-	-	-	-	-	-	**4.40**	-	-	**118**	-	-	**328**	-	-
YVD-13	YVD-13-141217	12/17/2014	N	SXL0121	2	U	-	0.25	UJ	MSD	0.1	U	-	-	-	-	-	-	-	-	-	-	**4.74**	-	-	**119**	-	-	**355**	-	-
YVD-13	YVD-13-150317	03/17/2015	N	5904541	2	U	-	0.25	UJ	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**4.00**	-	-	**120**	-	-	**290**	J-	MSD
YVD-13	YVD-13-150617	06/17/2015	N	59010961	2	U	-	**0.68**	J-	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**4.40**	J+	MSD	**120**	J+	MSD	**310**	-	-
YVD-13	YVD-13-150924	09/24/2015	N	59020391	2	U	-	0.25	UJ	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**4.10**	-	-	**110**	-	-	**330**	J-	MSD
YVD-13	YVD-13-151216	12/16/2015	N	59025501	2	U	-	-	R	MSD	0.25	UJ	MSD	-	-	-	-	-	-	-	-	-	**4.30**	-	-	**120**	-	-	**310**	-	-
YVD-13	YVD-13-160309	03/09/2016	N	59029941	2	U	-	0.25	UJ	FDP, MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**4.20**	-	-	**120**	-	-	**390**	J	DUP
YVD-13	YVD-13-160622	6/22/2016	N	59037271	2	U	-	-	R	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**4.20**	-	-	**120**	-	-	**390**	-	-
YVD-13	YVD-13-160928	9/28/2016	N	K1611698	0.10	U	-	-	R	MSD	-	-	-	**0.014**	-	-	-	-	-	-	-	-	**3.91**	-	-	**113**	-	-	**321**	-	-
YVD-13	YVD-13-161214	12/13/2016	N	K1615083	0.10	U	-	0.5	U	-	-	-	-	**0.047**	-	-	-	-	-	-	-	-	**4.02**	-	-	**111**	-	-	**313**	-	-
YVD-13	YVD-030717-08	3/7/2017	N	K1702324	**0.05**	J	HTQ	0.5	U	-	-	-	-	**0.010**	J	-	-	-	-	-	-	-	**3.63**	-	-	**105**	-	-	**277**	-	-
YVD-13	YVD-030717-10	3/7/2017	FD	K1702324	**0.04**	J	HTQ	0.5	U	-	-	-	-	**0.009**	J	-	-	-	-	-	-	-	**3.71**	-	-	**107**	-	-	**280**	-	-
YVD-13	YVD-060717-33	6/7/2017	N	K1705833	0.10	U	-	0.5	U	-	-	-	-	**0.014**	-	-	-	-	-	-	-	-	**3.83**	-	-	**114**	-	-	**282**	-	-
YVD-13	YVD-092617-25	9/26/2017	N	K1710333	0.10	U	-	0.5	U	-	-	-	-	0.010	U	-	-	-	-	-	-	-	**3.66**	-	-	**105**	-	-	**298**	-	-
YVD-13	YVD-120417-07	12/4/2017	N	K1713026	0.10	U	-	0.5	U	-	-	-	-	0.015	U	MBK	-	-	-	-	-	-	**3.41**	-	-	**102**	-	-	**271**	-	-
YVD-13	YVD-031918-19	3/19/2018	N	870634	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.82**	-	-	**102**	-	-	**249**	-	-
YVD-13	YVD-060318-09	6/3/2018	N	874568	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.01**	-	-	**108**	-	-	**235**	-	-
YVD-13	YVD-090918-14	9/9/2018	N	880601	0.050	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.90**	-	-	**104**	-	-	**222**	-	-
YVD-13	YVD-121018-11	12/10/2018	N	884857	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.95**	-	-	**104**	-	-	**225**	-	-
YVD-13	YVD-031819-15	3/18/2019	N	988273	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.04**	-	-	**105**	-	-	**223**	-	-
YVD-13	YVD-060319-25	6/3/2019	N	992053	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.87**	-	-	**103**	-	-	**201**	-	-
YVD-13	YVD-090919-10	9/9/2019	N	998357	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.95**	-	-	**95.0**	-	-	**197**	-	-
YVD-13	YVD-120919-10	12/9/2019	N	902276	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.90**	-	-	**102**	J	MSD	**191**	-	-
YVD-13	YVD-033020-09	3/30/2020	N	006241	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.92**	-	-	**100**	-	-	**200**	-	-
YVD-13	YVD-060920-21	6/9/2020	N	009269	0.050	U	-	5.0	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.97**	-	-	**106**	-	-	**176**	-	-
YVD-13	YVD-092120-13	9/21/2020	N	013896	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.04**	-	-	**103**	-	-	**198**	-	-
YVD-13	YVD-120820-17	12/8/2020	N	017137	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.16**	-	-	**102**	-	-	**166**	-	-
YVD-13	YVD-030221-15	3/2/2021	N	120034	0.050	U	-	5.0	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.96**	-	-	**101**	-	-	**195**	-	-
YVD-13	YVD-060821-32	6/8/2021	N	124212	0.050	U	-	0.50	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.96**	-	-	**100**	-	-	**196**	-	-
YVD-13	YVD-121521-16	12/15/2021	N	K2114550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 8
Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P-E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-13	YVD-031522-20	3/15/2022	N	K2202727	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-13	YVD-060722-24	6/7/2022	N	K2206237	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-14	YVD-14-130918	09/18/2013	N	SWI0123	2	U	-	0.25	U	-	-	-	-	-	-	-	0.1	U	-	-	-	-	**3.45**	-	-	**110**	-	-	**213**	-	-
YVD-14	YVD-14-131212	12/12/2013	N	SWL0078	2	U	-	0.7957	U	ERL	-	-	-	-	-	-	-	-	-	0.06	U	-	**3.29**	-	-	**108**	-	-	**186**	-	-
YVD-14	YVD-14-140319	03/19/2014	N	SXC0107	2	U	-	**0.562**	J-	MSD	0.05	U	-	-	-	-	-	-	-	-	-	-	**3.37**	-	-	**102**	-	-	**190**	-	-
YVD-14	YVD-14-140604	06/04/2014	N	SXF0025	2	U	-	0.25	UJ	MSD	**0.078**	-	-	-	-	-	-	-	-	-	-	-	**3.46**	-	-	**112**	-	-	**191**	-	-
YVD-14	YVD-14-140924	09/24/2014	N	SXI0173	2	U	-	0.25	U	-	**0.087**	J+	FBK	-	-	-	-	-	-	-	-	-	**4.10**	-	-	**124**	-	-	**178**	-	-
YVD-14	YVD-14-141217	12/17/2014	N	SXL0121	2	U	-	0.25	UJ	MSD	0.1	U	-	-	-	-	-	-	-	-	-	-	**3.83**	-	-	**113**	-	-	**185**	-	-
YVD-14	YVD-14-150318	03/18/2015	N	5904651	2	U	-	0.25	UJ	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**3.60**	J-	MSD	**130**	-	-	**180**	-	-
YVD-14R	YVD-14R-151216	12/16/2015	N	59025501	2	U	-	-	R	MSD	0.25	UJ	MSD	-	-	-	-	-	-	-	-	-	**4.40**	-	-	**120**	-	-	**160**	-	-
YVD-14R	YVD-14R-160309	03/09/2016	N	59029941	2	U	-	0.25	UJ	FDP, MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**4.40**	-	-	**130**	-	-	**180**	J	DUP
YVD-14R	YVD-14R-160622	6/22/2016	N	59037271	2	U	-	-	R	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**4.30**	-	-	**130**	-	-	**150**	-	-
YVD-14R	YVD-14R-160928	9/28/2016	N	K1611698	0.10	U	-	-	R	MSD	-	-	-	**0.015**	-	-	-	-	-	-	-	-	**4.05**	-	-	**126**	-	-	**140**	-	-
YVD-14R	YVD-14R-161212	12/12/2016	N	K1615029	0.10	UJ	HTQ	0.5	U	-	-	-	-	**0.058**	-	-	-	-	-	-	-	-	**4.09**	-	-	**119**	-	-	**158**	-	-
YVD-14R	YVD-D1-161212	12/12/2016	FD	K1615029	0.10	UJ	HTQ	0.5	U	-	-	-	-	**0.092**	-	-	-	-	-	-	-	-	**4.17**	-	-	**121**	-	-	**155**	-	-
YVD-14R	YVD-030917-19	3/9/2017	N	K1702404	0.10	U	-	0.5	U	-	-	-	-	**0.020**	-	-	-	-	-	-	-	-	**3.80**	-	-	**117**	-	-	**147**	-	-
YVD-14R	YVD-030917-21	3/9/2017	FD	K1702404	0.10	U	-	0.5	U	-	-	-	-	**0.019**	-	-	-	-	-	-	-	-	**3.75**	-	-	**115**	-	-	**151**	-	-
YVD-14R	YVD-060517-06	6/5/2017	N	K1705702	0.10	U	-	0.5	U	-	-	-	-	**0.038**	-	-	-	-	-	-	-	-	**3.53**	-	-	**110**	-	-	**142**	-	-
YVD-14R	YVD-092517-14	9/25/2017	N	K1710333	0.10	U	-	0.5	U	-	-	-	-	**0.018**	-	-	-	-	-	-	-	-	**3.85**	-	-	**121**	-	-	**138**	-	-
YVD-14R	YVD-120417-12	12/4/2017	N	K1713026	0.10	U	-	0.5	U	-	-	-	-	**0.024**	-	-	-	-	-	-	-	-	**3.54**	-	-	**116**	-	-	**124**	-	-
YVD-14R	YVD-031818-11	3/18/2018	N	870610	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.96**	-	-	**127**	-	-	**128**	-	-
YVD-14R	YVD-060318-04	6/3/2018	N	874568	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.18**	-	-	**130**	-	-	**123**	-	-
YVD-14R	YVD-090918-09	9/9/2018	N	880601	0.050	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.09**	-	-	**130**	-	-	**125**	-	-
YVD-14R	YVD-121018-02	12/10/2018	N	884857	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.39**	-	-	**131**	-	-	**139**	-	-
YVD-14R	YVD-121018-04	12/10/2018	FD	884857	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.36**	-	-	**131**	-	-	**136**	-	-
YVD-14R	YVD-031819-12	3/18/2019	N	988273	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.56**	-	-	**136**	-	-	**147**	-	-
YVD-14R	YVD-031819-14	3/18/2019	FD	988273	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.57**	-	-	**136**	-	-	**145**	-	-
YVD-14R	YVD-060319-22	6/3/2019	N	992053	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.42**	-	-	**136**	-	-	**145**	-	-
YVD-14R	YVD-060319-24	6/3/2019	FD	992053	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.38**	-	-	**132**	-	-	**131**	-	-
YVD-14R	YVD-090919-13	9/9/2019	N	998357	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.48**	-	-	**129**	-	-	**133**	-	-
YVD-14R	YVD-121019-15	12/10/2019	N	902321	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.71**	-	-	**128**	-	-	**123**	-	-
YVD-14R	YVD-121019-17	12/10/2019	FD	902321	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.75**	-	-	**128**	-	-	**124**	-	-
YVD-14R	YVD-033020-02	3/30/2020	N	006241	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.20**	-	-	**134**	-	-	**125**	-	-
YVD-14R	YVD-033020-04	3/30/2020	FD	006241	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.34**	-	-	**134**	-	-	**123**	-	-
YVD-14R	YVD-060920-20	6/9/2020	N	009269	0.050	U	-	5.0	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.44**	-	-	**152**	-	-	**132**	-	-
YVD-14R	YVD-092120-14	9/21/2020	N	013896	0.050	U	-	2.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.31**	-	-	**144**	-	-	**124**	-	-
YVD-14R	YVD-120820-20	12/8/2020	N	017137	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.60**	-	-	**144**	-	-	**129**	-	-
YVD-14R	YVD-030121-08	3/1/2021	N	119931	0.050	U	-	5.0	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.59**	-	-	**147**	-	-	**122**	-	-
YVD-14R	YVD-060621-09	6/6/2021	N	124053	0.050	U	-	5.0	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.71**	-	-	**146**	-	-	**114**	-	-
YVD-14R	YVD-121421-08	12/14/2021	N	K2114499	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-14R	YVD-031422-07	3/14/2022	N	K2202633	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-14R	YVD-060522-09	6/5/2022	N	K2206116	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-15	YVD-15-130917	09/17/2013	N	SWI0123	2	U	-	0.25	U	-	-	-	-	-	-	-	0.1	U	-	-	-	-	**2.73**	-	-	**127**	-	-	**51.5**	-	-
YVD-15	YVD-15-131212	12/12/2013	N	SWL0078	2	U	-	0.2	U	-	-	-	-	-	-	-	-	-	-	**0.238**	-	-	**4.48**	-	-	**114**	-	-	**114**	-	-
YVD-15	YVD-15-140319	03/19/2014	N	SXC0107	2	U	-	**0.553**	J-	MSD	**0.22**	-	-	-	-	-	-	-	-	-	-	-	**5.23**	-	-	**93.5**	-	-	**44.7**	-	-
YVD-15	YVD-15-140603	06/03/2014	N	SXF0025	2	U	-	**0.475**	J-	MSD	**0.31**	-	-	-	-	-	-	-	-	-	-	-	**5.20**	-	-	**110**	-	-	**39**	-	-

Table 8
Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P-E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-15	YVD-15-140924	09/24/2014	N	SXI0173	2	U	-	**1.19**	J+	MSD	**0.072**	J+	FBK	-	-	-	-	-	-	-	-	-	**3.11**	-	-	**135**	-	-	**50.7**	-	-
YVD-15	YVD-15-141217	12/17/2014	N	SXL0121	2	U	-	**0.414**	J-	MSD	**0.17**	-	-	-	-	-	-	-	-	-	-	-	**3.67**	-	-	**60.3**	-	-	**53.4**	-	-
YVD-15	YVD-15-150317	03/17/2015	N	5904651	2	U	-	0.25	UJ	MSD	**0.27**	-	-	-	-	-	-	-	-	-	-	-	**8.40**	J-	MSD	**160**	-	-	**53**	-	-
YVD-15	YVD-15-150617	06/17/2015	N	59011021	0.2	U	-	-	R	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**4.60**	J	RPD	**110**	J	RPD	**59**	-	-
YVD-15	YVD-15-150925	09/25/2015	N	59020431	2	U	-	2.5	U	-	0.25	U	-	-	-	-	-	-	-	-	-	-	**3.90**	-	-	**80.0**	-	-	**47**	-	-
YVD-15	YVD-15-151215	12/15/2015	N	59025431	2	U	-	-	R	MSD	0.25	UJ	FDP	-	-	-	-	-	-	-	-	-	**4.10**	-	-	**80.0**	-	-	**40**	-	-
YVD-15	YVD-15-160309	03/09/2016	N	59029711	2	U	-	-	R	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**4.20**	-	-	**75.0**	-	-	**65**	J+	MSD
YVD-15	YVD-15-160621	6/21/2016	N	59037271	2	U	-	-	R	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**3.50**	-	-	**74.0**	-	-	**86**	-	-
YVD-15	YVD-15-160928	9/28/2016	N	K1611629	0.10	U	-	0.5	U	-	-	-	-	**0.023**	-	-	-	-	-	-	-	-	**3.15**	-	-	**66.2**	-	-	**108**	-	-
YVD-15	YVD-15-161215	12/15/2016	N	K1615126	0.10	U	-	0.5	U	-	-	-	-	**0.095**	-	-	-	-	-	-	-	-	**3.40**	-	-	**59.1**	-	-	**108**	-	-
YVD-15	YVD-030917-23	3/9/2017	N	K1702404	0.10	U	-	0.5	U	-	-	-	-	**0.011**	-	-	-	-	-	-	-	-	**2.95**	-	-	**55.3**	-	-	**125**	-	-
YVD-15	YVD-060617-20	6/6/2017	N	K1705754	0.10	U	-	0.5	U	-	-	-	-	**0.017**	-	-	-	-	-	-	-	-	**2.98**	-	-	**62.9**	-	-	**143**	-	-
YVD-15	YVD-092517-10	9/25/2017	N	K1710333	0.10	U	-	0.5	U	-	-	-	-	0.010	U	-	-	-	-	-	-	-	**3.21**	-	-	**74.5**	-	-	**167**	-	-
YVD-15	YVD-120517-28	12/5/2017	N	K1713091	0.10	U	-	0.5	UJ	MSD	-	-	-	**0.013**	-	-	-	-	-	-	-	-	**2.89**	-	-	**78.6**	-	-	**145**	-	-
YVD-15	YVD-031818-09	3/18/2018	N	870610	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.25**	-	-	**94.5**	-	-	**129**	-	-
YVD-15	YVD-060318-08	6/3/2018	N	874568	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.36**	-	-	**97.5**	-	-	**118**	-	-
YVD-15	YVD-090918-11	9/9/2018	N	880601	0.050	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.18**	-	-	**99.0**	-	-	**110**	-	-
YVD-15	YVD-121018-06	12/10/2018	N	884857	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.25**	-	-	**97.5**	-	-	**111**	-	-
YVD-15	YVD-031719-10	3/17/2019	N	988239	0.050	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.22**	-	-	**96.0**	-	-	**110**	-	-
YVD-15	YVD-060419-29	6/4/2019	N	992242	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.18**	-	-	**100**	-	-	**114**	-	-
YVD-15	YVD-090919-11	9/9/2019	N	998357	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.14**	-	-	**92.0**	-	-	**103**	-	-
YVD-15	YVD-121019-19	12/10/2019	N	902321	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.40**	-	-	**91.5**	-	-	**96.9**	-	-
YVD-15	YVD-033020-06	3/30/2020	N	006241	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.12**	-	-	**90.0**	-	-	**90.9**	-	-
YVD-15	YVD-060920-16	6/9/2020	N	009269	0.050	U	-	5.0	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.08**	-	-	**96.0**	-	-	**87.7**	-	-
YVD-15	YVD-092020-09	9/20/2020	N	013864	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.12**	-	-	**89.5**	-	-	**90.0**	-	-
YVD-15	YVD-120720-14	12/7/2020	N	017035	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.35**	-	-	**89.0**	-	-	**89.0**	-	-
YVD-15	YVD-030121-14	3/1/2021	N	119931	0.050	U	-	5.0	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.15**	-	-	**85.5**	-	-	**86.9**	-	-
YVD-15	YVD-060621-08	6/6/2021	N	124053	0.050	U	-	5.0	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.32**	-	-	**86.5**	-	-	**72.0**	-	-
YVD-15	YVD-121421-07	12/14/2021	N	K2114499	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-15	YVD-031422-05	3/14/2022	N	K2202633	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-15	YVD-060522-07	6/5/2022	N	K2206116	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-16	YVD-16-130923	09/23/2013	N	SWI0178	-	-	-	**0.375**	-	-	-	-	-	-	-	-	0.1	U	-	-	-	-	**6.16**	-	-	**81.7**	-	-	-	-	-
YVD-16	YVD-16-130926	09/26/2013	N	SWI0190	2	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**140**	-	-
YVD-16	YVD-16-131212	12/12/2013	N	SWL0073	2	U	-	0.2	UJ	MSD	-	-	-	-	-	-	-	-	-	0.06	U	-	**5.25**	-	-	**79.8**	-	-	**163**	-	-
YVD-16	YVD-16-140318	03/18/2014	N	SXC0107	2	U	-	**1.01**	J-	MSD	**1.4**	-	-	-	-	-	-	-	-	-	-	-	**15.00**	-	-	**75.5**	-	-	**130**	-	-
YVD-16	YVD-16-140603	06/03/2014	N	SXF0017	0.8	U	-	**0.741**	-	-	**0.83**	-	-	-	-	-	-	-	-	-	-	-	**8.47**	-	-	**78.4**	-	-	**131**	J-	MSD
YVD-16	YVD-16-140923	09/23/2014	N	SXI0173	1	U	-	**0.747**	J+	MSD	**0.22**	-	-	-	-	-	-	-	-	-	-	-	**7.48**	-	-	**94.1**	-	-	**114**	-	-
YVD-16	YVD-16-141217	12/17/2014	N	SXL0121	1	U	-	0.25	UJ	MSD	**0.25**	J	FDP	-	-	-	-	-	-	-	-	-	**6.77**	-	-	**83.7**	-	-	**118**	-	-
YVD-16	YVD-D3-141217	12/17/2014	FD	SXL0121	0.2	U	-	**0.29**	J-	MSD	**0.1**	J	FDP	-	-	-	-	-	-	-	-	-	**6.27**	-	-	**81.7**	-	-	**130**	-	-
YVD-16	YVD-16-150317	03/17/2015	N	5904651	1	U	-	**0.29**	J-	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**6.10**	J-	MSD	**87.0**	-	-	**120**	-	-
YVD-16	YVD-16-150616	06/16/2015	N	59010961	1	U	-	0.25	UJ	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**6.20**	J+	MSD	**91.0**	J+	MSD	**120**	-	-
YVD-16	YVD-16-150923	09/23/2015	N	59020281	1	U	-	-	R	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**6.50**	-	-	**85.0**	-	-	**130**	-	-
YVD-16	YVD-16-151215	12/15/2015	N	59025431	1	U	-	-	R	MSD	0.25	UJ	FDP	-	-	-	-	-	-	-	-	-	**5.70**	-	-	**85.0**	-	-	**120**	-	-
YVD-16	YVD-16-160309	03/09/2016	N	59029711	1	U	-	-	R	MSD	**0.27**	-	-	-	-	-	-	-	-	-	-	-	**7.40**	-	-	**86.0**	-	-	**130**	J+	MSD
YVD-16	YVD-16-160621	6/21/2016	N	59037151	1	U	-	0.25	U	-	0.25	U	-	-	-	-	-	-	-	-	-	-	**5.90**	-	-	**86.0**	-	-	**120**	-	-
YVD-16	YVD-D2-160621	6/21/2016	FD	59037151	0.2	U	-	0.25	U	-	0.25	U	-	-	-	-	-	-	-	-	-	-	**6.00**	-	-	**88.0**	-	-	**120**	-	-
YVD-16	YVD-16-160928	9/28/2016	N	K1611629	0.10	U	-	0.5	U	-	-	-	-	**0.016**	-	-	-	-	-	-	-	-	**5.69**	-	-	**90.2**	-	-	**110**	-	-

Table 8
Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P-E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-16	YVD-16-161215	12/15/2016	N	K1615126	0.10	U	-	0.5	U	-	-	-	-	**0.068**	-	-	-	-	-	-	-	-	**5.59**	-	-	**82.5**	-	-	**112**	-	-
YVD-16	YVD-030917-22	3/9/2017	N	K1702404	0.10	U	-	0.5	U	-	-	-	-	**0.045**	-	-	-	-	-	-	-	-	**5.16**	-	-	**79.8**	-	-	**113**	-	-
YVD-16	YVD-060517-12	6/5/2017	N	K1705754	0.10	U	-	0.5	U	-	-	-	-	**0.021**	-	-	-	-	-	-	-	-	**5.08**	-	-	**83.0**	-	-	**117**	-	-
YVD-16	YVD-092617-28	9/26/2017	N	K1710381	0.10	U	-	0.5	U	-	-	-	-	**0.016**	-	-	-	-	-	-	-	-	**5.44**	-	-	**84.1**	-	-	**115**	-	-
YVD-16	YVD-120517-22	12/5/2017	N	K1713091	0.10	U	-	0.5	UJ	MSD	-	-	-	**0.048**	-	-	-	-	-	-	-	-	**5.17**	-	-	**80.1**	-	-	**110**	-	-
YVD-16	YVD-031918-16	3/19/2018	N	870634	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**5.25**	-	-	**79.0**	-	-	**106**	-	-
YVD-16	YVD-060318-10	6/3/2018	N	874568	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**5.55**	-	-	**88.0**	-	-	**104**	-	-
YVD-16	YVD-090918-07	9/9/2018	N	880601	0.050	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**5.20**	-	-	**83.5**	-	-	**107**	-	-
YVD-16	YVD-121118-20	12/11/2018	N	884939	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**5.85**	-	-	**84.0**	-	-	**106**	-	-
YVD-16	YVD-031719-08	3/17/2019	N	988239	0.050	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**5.45**	-	-	**82.0**	-	-	**109**	-	-
YVD-16	YVD-060219-06	6/2/2019	N	991939	0.050	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**5.45**	-	-	**80.5**	-	-	**106**	-	-
YVD-16	YVD-090919-07	9/9/2019	N	998357	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**5.30**	-	-	**77.0**	-	-	**107**	-	-
YVD-16	YVD-120919-11	12/9/2019	N	902276	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**5.35**	-	-	**79.5**	J	MSD	**106**	-	-
YVD-16	YVD-033120-16	3/31/2020	N	006260	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**5.35**	-	-	**82.0**	-	-	**107**	-	-
YVD-16	YVD-061020-30	6/10/2020	N	009361	0.050	U	-	0.5	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**5.20**	-	-	**79.0**	-	-	**106**	-	-
YVD-16	YVD-092020-06	9/20/2020	N	013864	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**5.45**	-	-	**81.0**	-	-	**112**	-	-
YVD-16	YVD-120720-08	12/7/2020	N	017035	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**5.95**	-	-	**84.0**	-	-	**112**	-	-
YVD-16	YVD-030121-02	3/1/2021	N	119931	0.050	U	-	2.5	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**5.25**	-	-	**78.0**	-	-	**113**	-	-
YVD-16	YVD-030121-04	3/1/2021	FD	119931	0.050	U	-	5.0	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**5.50**	-	-	**79.5**	-	-	**115**	-	-
YVD-16	YVD-060621-03	6/6/2021	N	124053	0.050	U	-	5.0	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**5.03**	-	-	**77.5**	-	-	**111**	-	-
YVD-16	YVD-121421-02	12/14/2021	N	K2114499	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-16	YVD-121421-03	12/14/2021	FD	K2114499	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-16	YVD-031522-17	3/15/2022	N	K2202727	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-16	YVD-060622-16	6/6/2022	N	K2206160	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-17	YVD-17-130919	09/19/2013	N	SWI0142	-	-	-	2.5	U	-	-	-	-	-	-	-	**3.64**	-	-	-	-	-	**8.32**	-	-	**12.2**	-	-	**6.48**	-	-
YVD-17	YVD-17-130924	09/24/2013	N	SWI0175	0.2	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-17	YVD-17-131210	12/10/2013	N	SWL0055	0.2	U	-	-	R	FBK, MSD	-	-	-	-	-	-	-	-	-	**1.61**	-	-	**5.25**	-	-	**7.9**	-	-	**6.64**	-	-
YVD-17	YVD-17-140316	03/16/2014	N	SXC0081	0.2	U	-	0.25	U	-	**0.3**	-	-	-	-	-	-	-	-	-	-	-	**1.73**	-	-	**6.1**	-	-	**6.42**	-	-
YVD-17	YVD-17-140601	06/01/2014	N	SXF0008	0.2	U	-	**0.287**	-	-	**0.52**	-	-	-	-	-	-	-	-	-	-	-	**2.22**	-	-	**8.7**	-	-	**5.74**	-	-
YVD-17	YVD-17-140922	09/22/2014	N	SXI0148	0.2	U	-	**0.293**	-	-	**0.36**	-	-	-	-	-	-	-	-	-	-	-	**2.91**	-	-	**9.9**	-	-	**5.08**	-	-
YVD-17	YVD-17-141215	12/15/2014	N	SXL0103	0.2	U	-	0.25	U	-	**0.19**	-	-	-	-	-	-	-	-	-	-	-	**1.84**	-	-	**9.2**	-	-	**6.01**	J+	MSD, DUP
YVD-17	YVD-17-150316	03/16/2015	N	5904471	0.2	U	-	0.25	UJ	MSD	0.25	UJ	MSD	-	-	-	-	-	-	-	-	-	**1.40**	-	-	**6.3**	-	-	**5.7**	-	-
YVD-17	YVD-D1-150316	03/16/2015	FD	5904471	0.2	U	-	0.25	UJ	MSD	0.25	UJ	MSD	-	-	-	-	-	-	-	-	-	**1.50**	-	-	**6.2**	-	-	**5.7**	-	-
YVD-17	YVD-17-150617	06/17/2015	N	59010961	0.2	U	-	0.25	UJ	MSD	**0.25**	-	-	-	-	-	-	-	-	-	-	-	**1.80**	J+	MSD	**8.7**	J+	MSD	**5.4**	-	-
YVD-17	YVD-17-150924	09/24/2015	N	59020391	**1.2**	-	-	0.25	UJ	MSD	**0.26**	-	-	-	-	-	-	-	-	-	-	-	**2.00**	-	-	**9.0**	-	-	**5.6**	J-	MSD
YVD-17	YVD-17-151216	12/16/2015	N	59025501	0.2	U	-	-	R	MSD	0.25	UJ	MSD	-	-	-	-	-	-	-	-	-	**1.40**	-	-	**8.0**	-	-	**5.4**	-	-
YVD-17	YVD-17-160310	03/10/2016	N	59029941	0.2	U	-	0.25	UJ	FDP	0.25	U	-	-	-	-	-	-	-	-	-	-	**1.20**	-	-	**6.4**	-	-	**4.8**	J	DUP
YVD-17	YVD-17-160623	6/23/2016	N	59037371	0.2	U	-	0.25	U	-	0.25	U	-	-	-	-	-	-	-	-	-	-	**1.60**	-	-	**8.3**	-	-	**5.3**	-	-
YVD-17	YVD-17-160926	9/26/2016	N	K1611565	0.10	U	-	-	R	MSD	-	-	-	**0.095**	-	-	-	-	-	-	-	-	**1.59**	-	-	**8.3**	-	-	**7.9**	-	-
YVD-17	YVD-17-161215	12/15/2016	N	K1615174	0.10	U	-	0.5	U	-	-	-	-	**0.103**	-	-	-	-	-	-	-	-	**1.46**	-	-	**7.4**	-	-	**6.0**	-	-
YVD-17	YVD-031017-29	3/10/2017	N	K1702448	0.10	U	-	0.5	U	-	-	-	-	**0.038**	-	-	-	-	-	-	-	-	**0.26**	-	-	**5.4**	-	-	**6.26**	-	-
YVD-17	YVD-060617-24	6/6/2017	N	K1705754	0.10	U	-	0.5	U	-	-	-	-	**0.055**	-	-	-	-	-	-	-	-	**1.16**	-	-	**7.81**	-	-	**6.02**	-	-
YVD-17	YVD-092517-08	9/25/2017	N	K1710274	0.10	U	-	0.5	U	-	-	-	-	**0.046**	-	-	-	-	-	-	-	-	**1.73**	-	-	**9.5**	-	-	**7.17**	-	-
YVD-17	YVD-120517-26	12/5/2017	N	K1713091	0.10	U	-	0.5	UJ	MSD	-	-	-	**0.036**	-	-	-	-	-	-	-	-	**1.55**	-	-	**9.87**	-	-	**7.53**	-	-
YVD-17	YVD-060418-20	6/4/2018	N	874662	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**0.78**	-	-	**7.20**	-	-	**6.54**	-	-
YVD-17	YVD-060219-12	6/2/2019	N	991939	0.050	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	0.62	U	-	**5.95**	-	-	**3.50**	-	-

Table 8
Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P-E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-17	YVD-060820-10	6/8/2020	N	009144	0.050	U	-	0.5	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	0.62	U	-	**6.20**	-	-	**6.06**	-	-
YVD-17	YVD-060621-04	6/6/2021	N	124053	0.050	U	-	0.50	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	0.62	U	-	**5.75**	-	-	**5.44**	-	-
YVD-17	YVD-060621-05	6/6/2021	FD	124053	0.050	U	-	0.50	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	0.62	U	-	**5.75**	-	-	**5.31**	-	-
YVD-17	YVD-060622-14	6/6/2022	N	K2206160	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**	-	-	**-**	-	-
YVD-18	YVD-18-130919	09/19/2013	N	SWI0142	-	-	-	-	R	FBK	-	-	-	-	-	-	0.1	U	-	-	-	-	**3.22**	-	-	**78.3**	-	-	**122**	-	-
YVD-18	YVD-18-130925	09/25/2013	N	SWI0175	2	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-18	YVD-18-131211	12/11/2013	N	SWL0073	2	U	-	1.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.06	U	-	**3.02**	-	-	**71.3**	-	-	**116**	-	-
YVD-18	YVD-D2-131211	12/11/2013	FD	SWL0073	2	U	-	0.2	UJ	MSD	-	-	-	-	-	-	-	-	-	0.06	U	-	**3.06**	-	-	**70.9**	-	-	**129**	-	-
YVD-18	YVD-18-140318	03/18/2014	N	SXC0095	2	U	-	**0.358**	-	-	**0.068**	-	-	-	-	-	-	-	-	-	-	-	**3.30**	-	-	**77.5**	-	-	**147**	J-	MSD
YVD-18	YVD-D2-140318	03/18/2014	FD	SXC0095	2	U	-	**0.342**	-	-	**0.082**	-	-	-	-	-	-	-	-	-	-	-	**3.26**	-	-	**78.0**	-	-	**140**	J-	MSD
YVD-18	YVD-18-140603	06/03/2014	N	SXF0017	0.8	U	-	**0.796**	-	-	**0.071**	J+	FBK	-	-	-	-	-	-	-	-	-	**3.24**	-	-	**77.7**	-	-	**135**	J-	MSD
YVD-18	YVD-18-140923	09/23/2014	N	SXI0173	1	U	-	**0.335**	J+	MSD	**0.086**	-	-	-	-	-	-	-	-	-	-	-	**3.80**	-	-	**81.6**	-	-	**111**	-	-
YVD-18	YVD-18-141216	12/16/2014	N	SXL0121	1	U	-	0.25	UJ	MSD	0.1	U	-	-	-	-	-	-	-	-	-	-	**3.63**	-	-	**81.8**	-	-	**131**	-	-
YVD-18	YVD-18-150317	03/17/2015	N	5904541	1	U	-	0.25	UJ	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**3.50**	-	-	**87.0**	-	-	**140**	J-	MSD
YVD-18	YVD-18-150617	06/17/2015	N	59010961	1	U	-	0.25	UJ	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**4.10**	J+	MSD	**86.0**	J+	MSD	**120**	-	-
YVD-18	YVD-18-150924	09/24/2015	N	59020391	1	U	-	0.25	UJ	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**3.50**	-	-	**77.0**	-	-	**140**	J-	MSD
YVD-18	YVD-18-151216	12/16/2015	N	59025501	1	U	-	-	R	MSD	0.25	UJ	MSD	-	-	-	-	-	-	-	-	-	**4.00**	-	-	**91.0**	-	-	**150**	-	-
YVD-18	YVD-18-160309	03/09/2016	N	59029941	1	U	-	0.25	UJ	FDP, MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**3.80**	-	-	**89.0**	-	-	**150**	J	DUP
YVD-18	YVD-18-160622	6/22/2016	N	59037271	1	U	-	-	R	MSD	0.25	U	-	-	-	-	-	-	-	-	-	-	**3.70**	-	-	**86.0**	-	-	**140**	-	-
YVD-18	YVD-18-160928	9/28/2016	N	K1611629	0.10	U	-	0.5	U	-	-	-	-	**0.013**	-	-	-	-	-	-	-	-	**3.75**	-	-	**83.8**	-	-	**135**	-	-
YVD-18	YVD-18-161214	12/14/2016	N	K1615083	0.10	U	-	0.5	U	-	-	-	-	**0.043**	-	-	-	-	-	-	-	-	**3.69**	-	-	**82.5**	-	-	**139**	-	-
YVD-18	YVD-D3-161214	12/14/2016	FD	K1615083	0.10	U	-	0.5	U	-	-	-	-	**0.019**	-	-	-	-	-	-	-	-	**3.82**	-	-	**84.0**	-	-	**142**	-	-
YVD-18	YVD-030617-05	3/6/2017	N	K1702324	**0.04**	J	HTQ	0.5	U	-	-	-	-	**0.024**	-	-	-	-	-	-	-	-	**3.39**	-	-	**78.8**	-	-	**140**	-	-
YVD-18	YVD-060717-31	6/7/2017	N	K1705833	0.10	U	-	0.5	U	-	-	-	-	**0.018**	-	-	-	-	-	-	-	-	**3.82**	-	-	**81.8**	-	-	**135**	-	-
YVD-18	YVD-092617-27	9/26/2017	N	K1710333	0.10	U	-	0.5	U	-	-	-	-	**0.018**	-	-	-	-	-	-	-	-	**3.64**	-	-	**77.0**	-	-	**137**	-	-
YVD-18	YVD-120417-05	12/4/2017	N	K1713026	0.10	U	-	0.5	U	-	-	-	-	0.017	U	MBK	-	-	-	-	-	-	**3.62**	-	-	**81.6**	-	-	**144**	-	-
YVD-18	YVD-031918-17	3/19/2018	N	870634	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.78**	-	-	**83.0**	-	-	**161**	-	-
YVD-18	YVD-060318-07	6/3/2018	N	874568	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.18**	-	-	**88.5**	-	-	**147**	-	-
YVD-18	YVD-090918-12	9/9/2018	N	880601	0.050	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.20**	-	-	**78.0**	-	-	**127**	-	-
YVD-18	YVD-121018-09	12/10/2018	N	884857	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.10**	-	-	**87.0**	-	-	**145**	-	-
YVD-18	YVD-031819-13	3/18/2019	N	988273	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.22**	-	-	**88.0**	-	-	**171**	-	-
YVD-18	YVD-060319-23	6/3/2019	N	992053	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.09**	-	-	**86.0**	-	-	**161**	-	-
YVD-18	YVD-090919-06	9/9/2019	N	998357	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.08**	-	-	**76.5**	-	-	**130**	-	-
YVD-18	YVD-090919-08	9/9/2019	FD	998357	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.09**	-	-	**77.0**	-	-	**130**	-	-
YVD-18	YVD-120919-08	12/9/2019	N	902276	0.050	U		0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U		**4.18**			**86.0**	J	MSD	**157**		
YVD-18	YVD-033020-07	3/30/2020	N	006241	0.050	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.04**	-	-	**87.5**	-	-	**170**	-	-
YVD-18	YVD-060920-19	6/9/2020	N	009269	0.050	U	-	5.0	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**3.98**	-	-	**89.0**	-	-	**155**	-	-
YVD-18	YVD-092120-15	9/21/2020	N	013896	0.050	U	-	0.50	UJ	MSD	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.03**	-	-	**83.0**	-	-	**145**	-	-
YVD-18	YVD-092120-17	9/21/2020	FD	013896	0.050	U	-	2.5	UJ	MSD	-	-	-	-	-	-	-	-	-	**0.07**	-	-	**4.00**	-	-	**83.0**	-	-	**144**	-	-
YVD-18	YVD-120820-15	12/8/2020	N	017137	0.050	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.11**	-	-	**88.0**	-	-	**164**	-	-
YVD-18	YVD-030221-17	3/2/2021	N	120034	0.050	U	-	5.0	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.02**	-	-	**87.0**	-	-	**169**	-	-
YVD-18	YVD-060821-30	6/8/2021	N	124212	0.050	U	-	0.50	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	**4.02**	-	-	**85.5**	-	-	**161**	-	-
YVD-18	YVD-121521-12	12/15/2021	N	K2114550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-18	YVD-121521-14	12/15/2021	FD	K2114550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-18	YVD-031522-18	3/15/2022	N	K2202727	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-18	YVD-060722-25	6/7/2022	N	K2206237	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YVD-18	YVD-060722-26	6/7/2022	FD	K2206237	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 8
Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P-E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
Equipment Blank	YVD-EB-130918	09/18/2013	EB	SWI0123	0.2	U	-	0.25	U	-	-	-	-	-	-	-	0.1	U	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Equipment Blank	YVD-EB-130925	09/25/2013	EB	SWI0175	0.2	U	-	0.25	U	-	-	-	-	-	-	-	0.1	U	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Equipment Blank	YVD-EB-131212	12/12/2013	EB	SWL0078	0.2	U	-	0.2	U	-	-	-	-	-	-	-	-	-	-	0.06	U	-	1	U	-	0.5	U	-	0.5	U	-
Equipment Blank	YVD-EB-140317	03/17/2014	EB	SXC0081	0.2	U	-	0.25	U	-	-	-	-	0.05	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Equipment Blank	YVD-EB-140318	03/18/2014	EB	SXC0095	0.2	U	-	0.25	U	-	-	-	-	**0.05**	-	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Equipment Blank	YVD-EB-140319	03/19/2014	EB	SXC0107	0.2	U	-	0.25	U	-	-	-	-	0.05	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Equipment Blank	YVD-EB-140604	06/04/2014	EB	SXF0025	0.2	U	-	0.25	U	-	-	-	-	0.05	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	**1.24**	-	-
Equipment Blank	YVD-EB-140924	09/24/2014	EB	SXI0173	0.2	U	-	**1.2**	-	-	-	-	-	**0.062**	-	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Equipment Blank	YVD-EB-141217	12/17/2014	EB	SXL0144	0.2	U	-	0.25	U	-	-	-	-	0.1	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Equipment Blank	YVD-EB-150617	06/17/2015	EB	59011021	0.2	U	-	**0.37**	-	-	-	-	-	0.25	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Equipment Blank	YVD-EB-150925	09/25/2015	EB	59020431	0.2	U	-	**0.38**	-	-	-	-	-	0.25	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Equipment Blank	YVD-EB-151216	12/16/2015	EB	59025501	0.2	U	-	0.25	U	-	-	-	-	0.25	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Equipment Blank	YVD-EB-160310	03/10/2016	EB	59029941	0.2	U	-	**1.9**	-	-	-	-	-	0.25	U	-	-	-	-	-	-	-	1	U	-	**1.1**	-	-	0.5	U	-
Equipment Blank	YVD-EB-160623	6/23/2016	EB	59037371	0.2	U	-	**0.43**	-	-	-	-	-	0.25	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Equipment Blank	YVD-EB-160926	9/26/2016	EB	K1611506	0.10	U	-	-	R	MSD	-	-	-	0.01	U	-	-	-	-	-	-	-	**0.1**	J	-	**0.13**	J	-	0.2	U	-
Equipment Blank	YVD-EB-160927	9/27/2016	EB	K1611629	0.05	UJ	HTQ	0.5	U	-	-	-	-	0.01	U	-	-	-	-	-	-	-	0.2	U	-	**0.04**	J	-	**0.08**	J	-
Equipment Blank	YVD-EB-160928	9/28/2016	EB	K1611629	0.05	U	-	0.5	U	-	-	-	-	0.01	U	-	-	-	-	-	-	-	0.2	U	-	**0.04**	J	-	**0.51**	-	-
Equipment Blank	YVD-EB1-161214	12/14/2016	EB	K1615083	0.10	U	-	0.5	U	-	-	-	-	0.01	U	-	-	-	-	-	-	-	0.21	U	-	0.21	U	-	0.2	U	-
Equipment Blank	YVD-EB2-161215	12/15/2016	EB	K1615126	0.10	U	-	0.5	U	-	-	-	-	0.01	U	-	-	-	-	-	-	-	0.21	U	-	0.21	U	MBK	0.2	U	-
Equipment Blank	YVD-EB3-161216	12/16/2016	EB	K1615174	0.10	U	-	0.5	U	-	-	-	-	0.01	U	-	-	-	-	-	-	-	0.21	U	-	0.21	U	MBK	**0.4**	-	-
Field Blank	YVD-F1-130916	09/16/2013	FB	SWI0113	0.2	U	-	0.25	U	-	-	-	-	-	-	-	0.1	U	-	-	-	-	1	U	-	0.5	U	-	**0.53**	-	-
Field Blank	YVD-F2-130917	09/17/2013	FB	SWI0113	0.2	U	-	0.25	U	-	-	-	-	-	-	-	0.1	U	-	-	-	-	1	U	-	0.5	U	-	**0.51**	-	-
Field Blank	YVD-F3-130918	09/18/2013	FB	SWI0123	0.2	U	-	0.25	U	-	-	-	-	-	-	-	0.1	U	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F4-130918	09/18/2013	FB	SWI0138	0.2	U	-	0.25	U	-	-	-	-	-	-	-	0.1	U	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F5-130919	09/19/2013	FB	SWI0142	-	-	-	**0.373**	-	-	-	-	-	-	-	-	**0.243**	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F6-130923	09/23/2013	FB	SWI0178	-	-	-	0.25	U	-	-	-	-	-	-	-	0.1	U	-	-	-	-	1	U	-	0.5	U	-	-	-	-
Field Blank	YVD-F7-130924	09/24/2013	FB	SWI0175	0.2	U	-	0.25	U	-	-	-	-	-	-	-	0.1	U	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F7-130926	09/26/2013	FB	SWI0190	0.2	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	U	-

Table 8
Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P-E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
Field Blank	YVD-F1-131209	12/09/2013	FB	SWL0055	0.2	U	-	**0.33**	-	-	-	-	-	-	-	-	-	-	-	0.06	U	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F2-131210	12/10/2013	FB	SWL0063	0.2	U	-	**3.7**	-	-	-	-	-	-	-	-	-	-	-	0.06	U	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F3-131211	12/11/2013	FB	SWL0073	0.2	U	-	**0.43**	-	-	-	-	-	-	-	-	-	-	-	0.06	U	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F4-131212	12/12/2013	FB	SWL0078	0.2	U	-	0.2	U	-	-	-	-	-	-	-	-	-	-	0.06	U	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F1-140316	03/16/2014	FB	SXC0081	0.2	U	-	0.25	U	-	-	-	-	0.05	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F2-140317	03/17/2014	FB	SXC0095	0.2	U	-	0.25	U	-	-	-	-	0.05	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F3-140318	03/18/2014	FB	SXC0107	0.2	U	-	0.25	U	-	-	-	-	0.05	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F4-140319	03/19/2014	FB	SXC0107	0.2	U	-	0.25	U	-	-	-	-	0.05	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F1-140601	06/01/2014	FB	SXF0008	0.2	U	-	0.25	U	-	-	-	-	0.05	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F2-140602	06/02/2014	FB	SXF0017	0.2	U	-	0.25	U	-	-	-	-	**0.061**	-	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F3-140603	06/03/2014	FB	SXF0025	0.2	U	-	0.25	U	-	-	-	-	0.05	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F1-140921	09/21/2014	FB	SXI0148	0.2	U	-	0.25	U	-	-	-	-	0.05	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F2-140922	09/22/2014	FB	SXI0148	0.2	U	-	0.25	U	-	-	-	-	0.05	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F3-140923	09/23/2014	FB	SXI0158	0.2	U	-	0.25	U	-	-	-	-	0.05	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F4-140924	09/24/2014	FB	SXI0173	0.2	U	-	0.25	U	-	-	-	-	**0.054**	-	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F1-141215	12/15/2014	FB	SXL0103	0.2	U	-	0.25	U	-	-	-	-	0.1	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	UJ	DUP
Field Blank	YVD-F2-141215	12/15/2014	FB	SXL0108	0.2	U	-	0.25	U	-	-	-	-	0.1	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F3-141216	12/16/2014	FB	SXL0121	0.2	U	-	0.25	U	-	-	-	-	0.1	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F4-141217	12/17/2014	FB	SXL0144	-	R	HTQ	0.25	U	-	-	-	-	0.1	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F1-150315	03/15/2015	FB	5904471	0.2	U	-	0.25	U	-	-	-	-	0.25	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F2-150316	03/16/2015	FB	5904541	0.2	U	-	0.25	U	-	-	-	-	0.25	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F3-150317	03/17/2015	FB	5904651	0.2	U	-	0.25	U	-	-	-	-	0.25	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F1-150615	06/15/2015	FB	59010751	0.2	U	-	0.25	U	-	-	-	-	0.25	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F2-150616	06/16/2015	FB	59010961	0.2	U	-	0.25	U	-	-	-	-	0.25	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F3-150617	06/17/2015	FB	59011021	0.2	U	-	0.25	U	-	-	-	-	0.25	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F1-150922	09/22/2015	FB	59020141	0.2	U	-	**0.26**	-	-	-	-	-	0.25	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F2-150923	09/23/2015	FB	59020281	0.2	U	-	0.25	U	-	-	-	-	**0.26**	-	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F3-150923	09/23/2015	FB	59020391	0.2	U	-	0.25	U	-	-	-	-	0.25	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F4-150924	09/24/2015	FB	59020391	0.2	U	-	0.25	U	-	-	-	-	0.25	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F5-150925	09/25/2015	FB	59020431	0.2	U	-	0.25	U	-	-	-	-	0.25	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F1-151213	12/13/2015	FB	59025351	0.2	U	-	0.25	U	-	-	-	-	0.25	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F2-151214	12/14/2015	FB	59025431	0.2	U	-	0.25	U	-	-	-	-	0.25	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F3-151215	12/15/2015	FB	59025501	0.2	U	-	0.25	U	-	-	-	-	0.25	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F4-151216	12/16/2015	FB	59025501	0.2	U	-	0.25	U	-	-	-	-	0.25	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F1-160307	03/07/2016	FB	59029521	0.2	U	-	0.25	U	-	-	-	-	0.25	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F2-160308	03/08/2016	FB	59029711	0.2	U	-	0.25	U	-	-	-	-	0.25	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F3-160309	03/09/2016	FB	59029941	0.2	U	-	**0.3**	-	-	-	-	-	0.25	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F4-160310	03/10/2016	FB	59029941	0.2	U	-	0.25	U	-	-	-	-	0.25	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F1-160620	6/20/2016	FB	59037101	0.2	U	-	0.25	U	-	-	-	-	0.25	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F2-160621	6/21/2016	FB	59037151	0.2	U	-	0.25	U	-	-	-	-	0.25	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F3-160622	6/22/2016	FB	59037271	0.2	U	-	**0.36**	-	-	-	-	-	0.25	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-F4-160623	6/23/2016	FB	59037371	0.2	U	-	0.25	U	-	-	-	-	0.25	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Field Blank	YVD-FB-160926	9/26/2016	FB	K1611506	0.10	U	-	-	R	MSD	-	-	-	0.01	U	-	-	-	-	-	-	-	**0.08**	J	-	**0.03**	J	-	0.2	U	-
Field Blank	YVD-FB-160927	9/27/2016	FB	K1611565	0.10	U	-	-	R	MSD	-	-	-	0.01	U	-	-	-	-	-	-	-	0.2	U	-	0.2	U	-	0.2	U	-
Field Blank	YVD-FB-160928	9/28/2016	FB	K1611629	0.05	U	-	0.5	U	-	-	-	-	0.01	U	-	-	-	-	-	-	-	0.2	U	-	**0.05**	J	-	**3.61**	-	-
Field Blank	YVD-FB-160929	9/29/2016	FB	K1611698	0.10	U	-	-	R	MSD	-	-	-	0.01	U	-	-	-	-	-	-	-	0.2	U	-	**0.05**	J	-	0.2	U	-
Field Blank	YVD-FB1-161212	12/12/2016	FB	K1615029	0.10	UJ	HTQ	0.5	U	-	-	-	-	0.01	U	-	-	-	-	-	-	-	0.21	U	-	0.21	U	MBK	0.2	U	MBK
Field Blank	YVD-FB2-161213	12/13/2016	FB	K1615045	0.10	U	-	0.5	U	-	-	-	-	0.01	U	-	-	-	-	-	-	-	0.21	U	-	0.21	U	MBK	0.2	U	-
Field Blank	YVD-FB3-161214	12/14/2016	FB	K1615083	0.10	U	-	0.5	U	-	-	-	-	0.01	U	-	-	-	-	-	-	-	0.21	U	-	0.21	U	MBK	**0.35**	-	-

Table 8
Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P-E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
Field Blank	YVD-FB4-161215	12/15/2016	FB	K1615126	0.10	U	-	0.5	U	-	-	-	-	0.01	U	-	-	-	-	-	-	-	0.21	U	-	0.21	U	MBK	0.2	U	-
Field Blank	YVD-FB5-161216	12/16/2016	FB	K1615174	0.10	U	-	0.5	U	-	-	-	-	0.01	U	-	-	-	-	-	-	-	0.21	U	-	0.21	U	MBK	0.2	U	-
Field Blank	YVD-030617-01	3/6/2017	FB	K1702228	0.10	U	-	**0.2**	J	-	-	-	-	0.01	U	-	-	-	-	-	-	-	**0.08**	J	-	**0.04**	J	-	0.2	U	-
Field Blank	YVD-030717-06	3/7/2017	FB	K1702324	0.10	UJ	HTQ	0.5	U	-	-	-	-	0.01	U	-	-	-	-	-	-	-	0.21	U	-	0.21	U	-	0.2	U	-
Field Blank	YVD-030817-11	3/8/2017	FB	K1702324	0.10	U	-	0.5	U	-	-	-	-	0.01	U	-	-	-	-	-	-	-	0.21	U	-	0.21	U	-	0.03	J	-
Field Blank	YVD-030917-17	3/9/2017	FB	K1702404	0.10	U	-	0.5	U	-	-	-	-	0.01	U	-	-	-	-	-	-	-	0.21	U	-	0.21	U	-	0.2	U	-
Field Blank	YVD-031017-26	3/10/2017	FB	K1702448	0.10	U	-	0.5	U	-	-	-	-	0.01	U	-	-	-	-	-	-	-	0.21	U	-	0.21	U	-	0.26	-	-
Field Blank	YVD-031317-30	3/13/2017	FB	K1702489	0.10	U	-	0.5	U	-	-	-	-	0.01	U	-	-	-	-	-	-	-	0.21	U	-	0.21	U	-	0.2	U	-
Field Blank	YVD-060417-01	6/4/2017	FB	K1705702	21	U	-	**0.7**	-	-	-	-	-	0.01	U	-	-	-	-	-	-	-	0.021	U	-	**0.11**	J	-	5.3	U	-
Field Blank	YVD-060517-07	6/5/2017	FB	K1705702	0.10	U	-	0.5	U	-	-	-	-	0.01	U	-	-	-	-	-	-	-	**0.06**	J	-	**0.11**	J	-	**0.25**	-	-
Field Blank	YVD-060617-17	6/6/2017	FB	K1705754	0.10	U	-	0.5	U	-	-	-	-	0.01	U	-	-	-	-	-	-	-	0.21	U	-	0.21	U	-	0.2	U	-
Field Blank	YVD-060717-28	6/7/2017	FB	K1705833	0.10	U	-	0.5	U	-	-	-	-	0.01	U	-	-	-	-	-	-	-	0.21	U	-	**0.02**	J	-	0.2	U	-
Field Blank	YVD-092517-01	9/25/2017	FB	K1710274	0.10	U	-	0.5	U	-	-	-	-	0.010	U	-	-	-	-	-	-	-	0.21	U	MBK	0.21	U	MBK	0.20	U	-
Field Blank	YVD-092617-16	9/26/2017	FB	K1710333	0.10	U	-	0.5	U	-	-	-	-	0.010	U	-	-	-	-	-	-	-	**0.09**	J	-	0.21	U	MBK	**0.86**	-	-
Field Blank	YVD-120417-01	12/4/2017	FB	K1713026	0.10	U	-	0.5	U	-	-	-	-	0.010	U	-	-	-	-	-	-	-	0.21	U	-	0.21	U	-	0.20	U	-
Field Blank	YVD-120517-32	12/5/2017	FB	K1713091	0.10	UJ	HTQ	0.5	UJ	MSD	-	-	-	0.010	U	-	-	-	-	-	-	-	0.21	U	-	**0.07**	J	-	**0.71**	-	-
Field Blank	YVD-120617-25	12/6/2017	FB	K1713157	0.10	U	-	0.5	U	-	-	-	-	0.010	U	-	-	-	-	-	-	-	0.21	U	-	0.21	U	MBK	0.20	U	-
Field Blank	YVD-031818-01	3/18/2018	FB	870610	0.05	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.07	U	-	0.62	U	-	0.7	U	-	0.1	U	-
Field Blank	YVD-031918-10	3/19/2018	FB	870634	0.05	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.07	U	-	0.62	U	-	0.7	U	-	0.1	U	-
Field Blank	YVD-060318-01	6/3/2018	FB	874568	0.05	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.07	U	-	0.62	U	-	0.7	U	-	0.1	U	-
Field Blank	YVD-060418-12	6/4/2018	FB	874568	0.05	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.07	U	-	0.62	U	-	0.7	U	-	0.1	U	-
Field Blank	YVD-060518-26	6/5/2018	FB	874860	0.05	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.07	U	-	0.62	U	-	0.7	U	-	0.1	U	-
Field Blank	YVD-061218-33	6/12/2018	FB	875438	0.05	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.07	U	-	0.62	U	-	0.7	U	-	0.1	U	-
Field Blank	YVD-090918-01	9/9/2018	FB	880601	0.05	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.07	U	-	0.62	U	-	0.7	U	-	0.1	U	-
Field Blank	YVD-121018-01	12/10/2018	FB	884857	0.05	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.07	U	-	0.62	U	-	0.7	U	-	0.1	U	-
Field Blank	YVD-121118-12	12/11/2018	FB	884939	0.05	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.07	U	-	0.62	U	-	0.7	U	-	0.1	U	-
Field Blank	YVD-031719-01	3/17/2019	FB	988239	0.05	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.07	U	-	0.62	U	-	0.7	U	-	0.1	U	-
Field Blank	YVD-031819-11	3/18/2019	FB	988273	0.05	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.07	U	-	0.62	U	-	0.7	U	-	0.1	U	-
Field Blank	YVD-032019-20	3/20/2019	FB	988477	0.05	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.07	U	-	0.62	U	-	0.7	U	-	0.1	U	-
Field Blank	YVD-060219-01	6/2/2019	FB	991939	0.05	U	-	-	R	MSD	-	-	-	-	-	-	-	-	-	0.07	U	-	0.62	U	-	0.7	U	-	**0.46**	-	-
Field Blank	YVD-060319-13	6/3/2019	FB	992053	0.05	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.07	U	-	0.62	U	-	0.7	U	-	**0.34**	-	-
Field Blank	YVD-060419-26	6/4/2019	FB	992242	0.05	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.07	U	-	0.62	U	-	0.7	U	-	**0.13**	-	-
Field Blank	YVD-090919-01	9/9/2019	FB	998357	0.05	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.07	U	-	0.62	U	-	0.7	U	-	0.1	U	-
Field Blank	YVD-090919-03	9/9/2019	FB	998357	NS	-	-	NS	-	-	-	-	-	-	-	-	-	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-
Field Blank	YVD-091019-15	9/10/2019	FB	998438	0.05	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.07	U	-	0.62	U	-	0.7	U	-	0.1	U	-
Field Blank	YVD-091019-17	9/10/2019	FB	998438	NS	-	-	NS	-	-	-	-	-	-	-	-	-	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-
Field Blank	YVD-120919-01	12/9/2019	FB	902276	0.05	U	-	0.5	UJ	MSD	-	-	-	-	-	-	-	-	-	0.07	U	-	0.62	U	-	0.7	U	-	0.1	U	-
Field Blank	YVD-120919-09	12/9/2019	FB	902276	NS	-	-	NS	-	-	-	-	-	-	-	-	-	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-
Field Blank	YVD-121019-16	12/10/2019	FB	902321	0.05	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.07	U	-	0.62	U	-	0.7	U	-	0.1	U	-
Field Blank	YVD-121019-18	12/10/2019	FB	902321	NS	-	-	NS	-	-	-	-	-	-	-	-	-	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-
Field Blank	YVD-033020-01	3/30/2020	FB	006241	0.05	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.07	U	-	0.62	U	-	0.7	U	-	0.1	U	-
Field Blank	YVD-033020-03	3/30/2020	FB	006241	NS	-	-	NS	-	-	-	-	-	-	-	-	-	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-
Field Blank	YVD-033120-13	3/31/2020	FB	006260	0.05	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.07	U	-	0.62	U	-	0.7	U	-	0.1	U	-
Field Blank	YVD-033120-15	3/31/2020	FB	006260	NS	-	-	NS	-	-	-	-	-	-	-	-	-	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-
Field Blank	YVD-060820-01	6/8/2020	FB	009144	0.05	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.07	U	-	0.62	U	-	0.7	U	-	0.1	U	-
Field Blank	YVD-060820-02	6/8/2020	FB	009144	NS	-	-	NS	-	-	-	-	-	-	-	-	-	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-
Field Blank	YVD-060920-11	6/9/2020	FB	009269	0.05	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.07	U	-	0.62	U	-	0.7	U	-	0.1	U	-
Field Blank	YVD-060920-13	6/9/2020	FB	009269	NS	-	-	NS	-	-	-	-	-	-	-	-	-	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-
Field Blank	YVD-061020-29	6/10/2020	FB	009361	0.05	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.07	U	-	0.62	U	-	0.7	U	-	0.1	U	-

Table 8
Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P-E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
Field Blank	YVD-061020-28	6/10/2020	FB	009361	NS	-	-	NS	-	-	-	-	-	-	-	-	-	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-
Field Blank	YVD-092020-01	9/20/2020	FB	013864	0.05	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.07	U	-	0.62	U	-	0.7	U	-	0.1	U	-
Field Blank	YVD-092020-02	9/20/2020	FB	013864	NS	-	-	NS	-	-	-	-	-	-	-	-	-	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-
Field Blank	YVD-092120-10	9/21/2020	FB	013896	0.05	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.07	U	-	0.62	U	-	0.7	U	-	0.1	U	-
Field Blank	YVD-092120-12	9/21/2020	FB	013896	NS	-	-	NS	-	-	-	-	-	-	-	-	-	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-
Field Blank	YVD-120720-01	12/7/2020	FB	017035	0.05	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.07	U	-	0.62	U	-	0.7	U	-	0.1	U	-
Field Blank	YVD-120720-03	12/7/2020	FB	017035	NS	-	-	NS	-	-	-	-	-	-	-	-	-	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-
Field Blank	YVD-120820-16	12/8/2020	FB	017137	0.05	U	-	0.5	U	-	-	-	-	-	-	-	-	-	-	0.07	U	-	0.62	U	-	0.7	U	-	0.1	U	-
Field Blank	YVD-120820-18	12/8/2020	FB	017137	NS	-	-	NS	-	-	-	-	-	-	-	-	-	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-
Field Blank	YVD-030121-01	3/1/2021	FB	119931	0.05	U	-	1.1	J	MS	-	-	-	-	-	-	-	-	-	0.07	U	-	0.62	U	-	0.7	U	-	0.1	U	-
Field Blank	YVD-030121-03	3/1/2021	FB	119931	NS	-	-	NS	-	-	-	-	-	-	-	-	-	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-
Field Blank	YVD-030221-11	3/2/2021	FB	120034	0.05	U	-	0.8	J	MS	-	-	-	-	-	-	-	-	-	0.07	U	-	0.62	U	-	0.7	U	-	0.1	U	-
Field Blank	YVD-030221-13	3/2/2021	FB	120034	NS	-	-	NS	-	-	-	-	-	-	-	-	-	-	-	NS	-	-	NS	-	-	NS	-	-	NS	-	-
Field Blank	YVD-060621-01	6/6/2021	FB	124053	0.050	U	-	0.50	U	-	-	-	-	-	-	-	-	-	-	0.070	U	-	0.62	U	-	0.70	U	-	0.10	U	-
Field Blank	YVD-060621-02	6/6/2021	FB	124053	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Field Blank	YVD-060721-11	6/7/2021	FB	124105	0.050	U	-	0.8	J	MS, RPD	-	-	-	-	-	-	-	-	-	0.070	U	-	0.62	U	-	0.70	U	-	0.10	U	-
Field Blank	YVD-060721-12	6/7/2021	FB	124105	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Field Blank	YVD-060821-20	6/8/2021	FB	124212	0.050	U	-	0.50	UJ	MS	-	-	-	-	-	-	-	-	-	0.070	U	-	0.62	U	-	0.70	U	-	0.10	U	-
Field Blank	YVD-060821-21	6/8/2021	FB	124212	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Field Blank	YVD-121421-01	12/14/2021	FB	K2114499	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Field Blank	YVD-121521-13	12/15/2021	FB	K2114550	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Field Blank	YVD-031422-01	3/14/2022	FB	K2202633	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Field Blank	YVD-031522-09	3/15/2022	FB	K2202727	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Field Blank	YVD-060522-01	6/5/2022	FB	K2206116	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Field Blank	YVD-060622-13	6/6/2022	FB	K2206160	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Field Blank	YVD-060722-23	6/7/2022	FB	K2206237	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Field Blank	YVD-060822-33	6/8/2022	FB	K2206299	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Blank Check	WW-1	4/25/2016	BC	59032861	40	U	-	**1.4**	-	-	-	-	-	0.25	U	-	-	-	-	-	-	-	**190**	-	-	**400**	-	-	100	U	-
Blank Check	DW-1	4/25/2016	BC	59032861	0.2	U	-	0.25	U	-	-	-	-	0.25	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-
Blank Check	DI-1	4/25/2016	BC	59032861	0.2	U	-	0.25	U	-	-	-	-	0.25	U	-	-	-	-	-	-	-	1	U	-	0.5	U	-	0.5	U	-

Table 8
Historical Groundwater Analytical Results

Notes:
1. Well dry; no sample could be collected.
Bold: detected result
- : not applicable
(as N): reported as nitrogen
(as CaCO3): reported as calcium carbonate
BC: blank check
DUP: Laboratory duplicate relative percent difference was outside acceptance limits.
EB: equipment blank
EPA: U.S. Environmental Protection Agency
ERL: elevated reporting limit
FB: field blank
FBK: field blank contamination
FD: field duplicate
FDP: Field duplicate relative percent difference exceeded acceptance limits.
HTQ: Analysis completed outside of the designated holding time.
J: The compound was positively identified; however, the associated numerical value is an estimated concentration.
J-: The result is an estimated quantity, but the result may be biased low.
J+: The result is an estimated quantity, but the result may be biased high.
MBK: method blank contamination
mg/L: milligrams per liter
MSD: The matrix spike/matrix spike duplicate percent recoveries were outside target limits.
N: normal sample
NR: Sample did not meet collection criteria; not a representative sample.
NS: Not sampled
PRS: Incorrect sample preservation.
R: The sample results are rejected as unusable. The compound may or may not be present in the sample.
RPD: Relative percent difference was outside acceptance limits.
SM: Standard Method
U: The compound was analyzed for but not detected. The associated value is the compound reporting limit, or the compound is considered non-detect at the listed value due to associated blank contamination.
UJ: The compound was not detected above the reported sample reporting limit; however, the reporting limit is approximate and may or may not represent the actual limit of quantitation.

Appendix D
Data Validation Report

1201 3rd Avenue, Suite 2600
Seattle, Washington 98101
206.287.9130

ANCHOR QEA

Data Validation Report – EPA Stage 2A

June 22, 2022

Project: Yakima Valley Dairies

Project Number: 220996-01.01

Validation Number: AQ-2022-553596

This report summarizes the review of analytical results for 25 water samples, four field duplicate samples, and four field blank samples collected between June 5 and June 8, 2022. The samples were collected by Anchor QEA, LLC, and submitted to ALS Environmental (ALS), in Kelso, Washington. The samples were analyzed for the following:

- Nitrate by U.S. Environmental Protection Agency (USEPA) Method 300.0
- Nitrate + nitrite by USEPA Method 353.2

ALS sample data groups (SDGs) K2206116, K2206160, K2206237, and K2206299 were reviewed in this report. Sample IDs, matrices, and analyses are presented in Table 1.

Table 1
Sample IDs, Matrices, and Analyses

Location ID	Sample ID	Lab Sample ID	Matrix	Analyses
FB	YVD-060522-01	K2206116-001	Water	Nitrate
DC-05	YVD-060522-02	K2206116-002	Water	Nitrate
DC-05 (FD)	YVD-060522-03	K2206116-003	Water	Nitrate
DC-05D	YVD-060522-04	K2206116-004	Water	Nitrate
DC-04	YVD-060522-05	K2206116-005	Water	Nitrate
YVD-10	YVD-060522-06	K2206116-006	Water	Nitrate
YVD-15	YVD-060522-07	K2206116-007	Water	Nitrate
DC-07	YVD-060522-08	K2206116-008	Water	Nitrate
YVD-14R	YVD-060522-09	K2206116-009	Water	Nitrate
DC-03	YVD-060522-10	K2206116-010	Water	Nitrate
DC-03D	YVD-060522-11	K2206116-011	Water	Nitrate
YVD-09	YVD-060622-12	K2206160-001	Water	Nitrate
FB	YVD-060622-13	K2206160-002	Water	Nitrate
YVD-17	YVD-060622-14	K2206160-003	Water	Nitrate
DC-01	YVD-060622-15	K2206160-004	Water	Nitrate
YVD-16	YVD-060622-16	K2206160-005	Water	Nitrate
YVD-04	YVD-060622-17	K2206160-006	Water	Nitrate
YVD-11	YVD-060622-18	K2206160-007	Water	Nitrate
YVD-05	YVD-060622-19	K2206160-008	Water	Nitrate

Location ID	Sample ID	Lab Sample ID	Matrix	Analyses
YVD-12	YVD-060622-20	K2206160-009	Water	Nitrate
YVD-07	YVD-060622-21	K2206160-011	Water	Nitrate
YVD-07 (FD)	YVD-060622-22	K2206160-010	Water	Nitrate
FB	YVD-060722-23	K2206237-001	Water	Nitrate, nitrate + nitrite
YVD-13	YVD-060722-24	K2206237-002	Water	Nitrate, nitrate + nitrite
YVD-18	YVD-060722-25	K2206237-003	Water	Nitrate, nitrate + nitrite
YVD-18 (FD)	YVD-060722-26	K2206237-004	Water	Nitrate, nitrate + nitrite
YVD-08	YVD-060722-27	K2206237-005	Water	Nitrate, nitrate + nitrite
DC-14	YVD-060722-28	K2206237-006	Water	Nitrate, nitrate + nitrite
DC-09	YVD-060722-29	K2206237-007	Water	Nitrate
YVD-06	YVD-060722-30	K2206237-008	Water	Nitrate
YVD-03	YVD-060822-31	K2206299-001	Water	Nitrate
YVD-03 (FD)	YVD-060822-32	K2206299-002	Water	Nitrate
FB	YVD-060822-33	K2206299-003	Water	Nitrate

Notes:
FB: field blank
FD: field duplicate

Data Validation and Qualifications

The following comments refer to the laboratory's performance in meeting the quality assurance/quality control guidelines outlined in the analytical procedures. Laboratory results were reviewed using the laboratory control limits and the following guidelines:

- *Groundwater Monitoring Quality Assurance Project Plan, Addendum No. 1* (Anchor QEA 2016)
- *Groundwater Monitoring Quality Assurance Project Plan, Update No. 2* (Anchor QEA 2018)
- *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods* (USEPA 1986)
- *National Functional Guidelines for Inorganic Superfund Methods Data Review* (USEPA 2020)

Unless noted in this report, laboratory results for the samples listed in Table 1 were within quality control criteria.

Field Documentation

Field documentation was checked for completeness and accuracy. The chain-of-custody forms were signed by ALS at the time of sample receipt. Samples were received in good condition and within the recommended temperature range.

Holding Times and Sample Preservation

Samples were appropriately preserved and analyzed within holding times, except for some of the samples in SDG K2206237, which were analyzed several hours past the 48-hour hold time. Results were qualified "J" or "UJ" to indicate a potentially low bias.

Laboratory Method Blanks

Laboratory method blanks were analyzed at the required frequencies. All method blanks were free of target analytes.

Quality Control

Field Blanks

Four field blanks were collected in association with these sample sets. No target analytes were detected in the blanks.

Field Duplicates

Four field duplicates were collected in association with these sample sets. All relative percent difference (RPD) values were within control limits. Detected results are summarized in Table 2.

Table 2
Field Duplicate Summary

Analyte	YVD-060522-02	YVD-060522-03	RPD
Nitrate	41.7 mg/L	40.6 mg/L	5.0%

Analyte	YVD-060622-21	YVD-060622-22	RPD
Nitrate	4.3 mg/L	4.3 mg/L	0.0%

Analyte	YVD-060722-25	YVD-060722-26	RPD
Nitrate	30 mg/L	30.1 mg/L	0.6%

Analyte	YVD-060822-31	YVD-060822-32	RPD
Nitrate as nitrite	61.8 mg/L	61.2 mg/L	1.9%

Note:
mg/L: milligram per liter

Laboratory Control Samples

Laboratory control samples were analyzed at the required frequencies, and all analyses resulted in recovery values within project-required control limits.

Matrix Spike and Matrix Spike Duplicate Samples

Matrix spike (MS) samples and matrix spike duplicate (MSD) samples were analyzed on four project samples, two of which were field blanks that had been submitted blind to the laboratory. All MS/MSD recoveries and/or RPD values were within project-required control limits.

Laboratory Duplicates

Laboratory duplicates were analyzed on four project samples, two of which were field blanks submitted blind to the laboratory. All RPD values were within project-required control limits.

Sample Analyses

An additional container was submitted for preservation and archive for each sample. If the laboratory was unable to analyze a sample for nitrate by USEPA Method 300.0 within the 48-hour hold time, the archived sample was analyzed by USEPA Method 353.3, which is a measurement of both nitrate and nitrite. The RPD values between the two results were well below the project control limit of 20%. Results are presented in Table 3.

Table 3
Comparison of Results for Nitrate and Nitrate + Nitrite

Sample ID	Nitrate	Nitrate + Nitrite	RPD
YVD-060722-23	0.1U mg/L	0.05U mg/L	NA
YVD-060722-24	36.2 mg/L	35.7 mg/L	1%
YVD-060722-25	30.9 mg/L	30 mg/L	3%
YVD-060722-26	30.5 mg/L	30.1 mg/L	1%
YVD-060722-27	69.1 mg/L	66.8 mg/L	3%
YVD-060722-28	57.4 mg/L	54.6 mg/L	5%

Notes:
mg/L: milligram per liter
NA: not applicable

Method Reporting Limits

Method reporting limits (MRLs) were acceptable as reported. All values below detection were reported using the laboratory MRLs. Values were reported as undiluted, or when reported as diluted, the MRL accurately reflects the dilution factor.

Overall Assessment

As was determined by this evaluation, the laboratory followed the specified analytical methods, and all requested sample analyses were completed. Accuracy was acceptable as demonstrated by the

laboratory control and MS/MSD samples. Precision was acceptable as demonstrated by the laboratory and field duplicates. All data are acceptable as reported or as qualified. Project completeness was 100%. Table 4 summarizes the qualifiers applied to the sample results reviewed in this report.

Data Qualifier Definitions

U Indicates the compound or analyte was analyzed for but not detected at or above the specified limit.

UJ Indicates the compound or analyte of interest was analyzed for but not detected and the specified limit reported is estimated.

Table 4
Data Qualification Summary

Sample ID	Parameter	Analyte	Reported Result	Qualified Result	Reason
YVD-060722-23	Conventionals	Nitrate	0.1U mg/L	0.1UJ mg/L	Analyzed past hold time
YVD-060722-24	Conventionals	Nitrate	36.2 mg/L	36.2J mg/L	Analyzed past hold time
YVD-060722-25	Conventionals	Nitrate	30.9 mg/L	30.9J mg/L	Analyzed past hold time
YVD-060722-26	Conventionals	Nitrate	30.5 mg/L	30.5J mg/L	Analyzed past hold time
YVD-060722-27	Conventionals	Nitrate	69.1 mg/L	69.1J mg/L	Analyzed past hold time
YVD-060722-28	Conventionals	Nitrate	57.4 mg/L	57.4J mg/L	Analyzed past hold time
YVD-060722-29	Conventionals	Nitrate	6.76 mg/L	6.76J mg/L	Analyzed past hold time
YVD-060722-30	Conventionals	Nitrate	0.67 mg/L	0.67J mg/L	Analyzed past hold time

References

Anchor QEA (Anchor QEA, LLC), 2016. *Groundwater Monitoring Quality Assurance Project Plan, Addendum No. 1*. Prepared for Yakima Valley Dairies. November 2016.

Anchor QEA, 2018. *Groundwater Monitoring Quality Assurance Project Plan, Update No. 2*. Prepared for Yakima Valley Dairies. March 2018.

USEPA (U.S. Environmental Protection Agency), 1986. *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*. Third Edition. Office of Solid Waste and Emergency Response. EPA-530/SW-846. September 1986.

USEPA, 2020. *National Functional Guidelines for Inorganic Superfund Methods Data Review*. Office of Superfund Remediation and Technology Innovation. EPA-542-R-20-006. November 2020.

Eric Winiecki Declaration
Exhibit J

6720 S Macadam Avenue, Suite 125
Portland, Oregon 97219
503.670.1108

ANCHOR QEA

February 15, 2022

Eric Winiecki
United States Environmental Protection Agency
Region 10
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101-3140

Re: Fourth Quarter 2021 Groundwater Monitoring Data Report, Yakima Valley Dairies, SDWA-10-2013-0080

This quarterly groundwater monitoring report (report) has been prepared to supplement groundwater data collection initiated under the Administrative Order on Consent (AOC) Statement of Work.

The AOC requires 8 years of quarterly groundwater monitoring, which was completed in Second Quarter 2021. Under the AOC, this 8-year monitoring period is to be followed by data evaluation and a formal determination of next steps. This data evaluation process is now beginning.

Pending completion of the data evaluation process and definition of next steps under the AOC, the U.S. Environmental Protection Agency (EPA) and the Respondents to the AOC exchanged correspondence regarding the value of conducting continued nitrate monitoring. The monitoring data contained in this report were collected voluntarily consistent with a written proposal made by the Respondents in a letter to EPA dated October 4, 2021, and repeated in follow-up letters dated November 11, 2021, and December 10, 2021. In the December 10, 2021, letter, the Respondents informed EPA that they planned (during the following week of December 13, 2021) to voluntarily perform the groundwater monitoring event documented in this report. The Fourth Quarter 2021 groundwater monitoring event was then voluntarily conducted between December 14 to December 15, 2021.

EPA responded to the proposal from the Respondents for groundwater monitoring on January 25, 2022. In that letter EPA stated that the AOC did not require continued groundwater monitoring at this time but that it was in line with the goals of the AOC.

Groundwater monitoring was conducted using methods defined in the 2018 *Groundwater Monitoring Quality Assurance Project Plan* (QAPP; Anchor QEA 2018). Deviations from the QAPP as part of the Fourth Quarter 2021 monitoring event were as follows:

- Monitoring was performed on the subset of wells identified in the October 4, 2021, proposal from the Respondents to EPA. This excluded those wells that were dry and certain wells that

have been consistently below the nitrate MCL for at least the preceding eight monitoring events.

- Monitoring parameters were limited to those identified in the October 4, 2021, proposal from the Respondents to EPA and included groundwater elevation, groundwater field parameters, and nitrate concentrations.
- The analytical testing laboratory used during early 2021 (Cascade Analytical) was unavailable to perform the nitrate testing for the project. The lab previously used during AOC groundwater monitoring (ALS Environmental) was used instead for the monitoring event.

The locations of the monitoring wells are shown in Figure 1. The wells monitored in the current event are listed in Table 1.

Groundwater Monitoring Activities

Synoptic Depth to Static Water Level Measurement

Synoptic water level measurements were collected from all 26 wells in the monitoring network on December 14, 2021, using an electronic water level meter. The depths to water were measured to the nearest 0.01 foot from the indicated reference point on each well casing and recorded on the Water Level Survey Form presented in Appendix D of the 2018 QAPP. The depth-to-water measurements were collected from the 26 wells in as short a time period as possible (approximately 8 hours) to provide a "snapshot" of groundwater elevations and to reduce the effect of atmospheric pressure changes or precipitation effects on the water levels. Depth-to-water measurements were converted to groundwater elevations in the North American Vertical Datum of 1988 (NAVD88) by subtracting the measurements from the surveyed reference point elevation for each well. The depth-to-water measurements and calculated groundwater elevations for Fourth Quarter 2021 are shown in Table 2.

Continuous Groundwater Elevation Monitoring

Continuous long-term groundwater elevations are being monitored using non-vented Solinst Levelogger Junior Edge pressure transducers in six monitoring wells to evaluate seasonal fluctuations and trends in groundwater elevations. Two pressure transducers are installed in one of the shallow/deep monitoring well pairs to evaluate differences in hydraulic head and vertical gradients between the shallow and deep portions of the surficial aquifer. Wells with transducers include DC-03, the DC-05/DC-05D well pair, YVD-03, YVD-08, and YVD-11. Additionally, a Solinst Barologger Edge barometric pressure transducer is deployed at well YVD-08 to compensate water levels for atmospheric pressure.

Transducers recorded water levels in hourly increments from 12:00 p.m. on October 15, 2013, through December 7, 2020, at 8:00 a.m. Beginning December 7, 2020, at 8:45 a.m., the transducers began recording water levels in 15-minute increments to provide more accurate calibrations from

manual depth to water measurements. During data downloads, depths to water in wells were manually gauged using an electronic water level meter. Following the data download, water level data were compensated for atmospheric pressure and calibrated with concurrent field-verified groundwater elevation measurements. Groundwater hydrographs of the six wells with pressure transducers are provided in Appendix A.

Groundwater Elevation Seasonal Patterns

The hydrographs for many of the monitoring wells show a seasonal pattern of water level increases and decreases. For example, the water level in monitoring well YVD-02 historically increased about 12 feet from first quarter to second quarter before an adjacent irrigation ditch was converted to a closed pipe, after which the seasonal pattern became less pronounced.

Another example of seasonal water level fluctuation is observed in well YVD-17, which is located adjacent to the large, unlined Southside irrigation canal run by the Sunnyside Valley Irrigation District (Figure 1). According to the District fact sheet, irrigation usually runs from April 1 through October 20 with canal priming operations beginning in mid-March. The water elevation in YVD-17 varies seasonally by about 6 feet. The lowest water level of each year has consistently occurred in the first quarter (approximately April 1), and the highest water level of each year has consistently occurred in the third quarter (approximately October 1). This suggests that the travel time of water from the flowing irrigation canal to the relatively shallow drinking water aquifer at YVD-17 is likely in the range of days to weeks.

EPA has concluded that the seasonal fluctuations observed at monitoring wells indicate that percolation of water from the land surface to the aquifer in the vicinity of the Dairies can and does occur in a range of days to months. The time of travel depends on many factors including the soil type, existing amount of water in the soil, the duration and amount of water, evapotranspiration, and depth to the water table. The percolating water could originate from surface water such as a canal or pond, excess irrigation water from a field, an earthen lagoon, precipitation, or some other source. The groundwater elevation seasonal patterns for each monitoring well are shown in Figure 2 and the following table:

Monitoring Well ID	Clear Seasonal Pattern? (Y/N)	Well Depth from Ground Surface to Mid-Point of Screen (feet)	Highest Groundwater Elevation in 3Q (Fall) and Lowest in 1Q (Spring)	Highest Groundwater Elevation in 4Q (Winter) and Lowest in 2Q (Summer)	Highest Groundwater Elevation in 1Q (Spring) and Lowest in 3Q (Fall)
YVD-02	Y	25	X		
YVD-17	Y	38	X		
DC-04	Y	40	X		
DC-07	Y	49		X	

Monitoring Well ID	Clear Seasonal Pattern? (Y/N)	Well Depth from Ground Surface to Mid-Point of Screen (feet)	Highest Groundwater Elevation in 3Q (Fall) and Lowest in 1Q (Spring)	Highest Groundwater Elevation in 4Q (Winter) and Lowest in 2Q (Summer)	Highest Groundwater Elevation in 1Q (Spring) and Lowest in 3Q (Fall)
DC-03	Y	73	X		
DC-05	Y	74		X	
YVD-14R	Y	81		X	
YVD-10	Y	93			X
YVD-15	Y	95		X	
YVD-11	N	107			
DC-03D	Y	111	X		
YVD-09	N	112			
YVD-16	Y	112			X
DC-05D	Y	122		X	
YVD-13	Y	131		X	
DC-14	N	139			
YVD-12	Y	141			X
DC-01	N	150			
YVD-07	Y	158			X
YVD-06	Y	159			X
YVD-05	Y	172			X
YVD-08	Y	172			X
YVD-18	Y	175		X	
DC-09	Y	184			X
YVD-03	Y	190			X
YVD-04	Y	235			X

Sample Collection

Groundwater samples were collected using low-flow purging and sampling procedures described in the Standard Operating Procedure (SOP) entitled *Low-Flow Groundwater Purging and Sampling Procedures for Monitoring Wells* presented in Appendix E of the 2018 QAPP.

Purging and sampling of the monitoring wells was performed with dedicated 1-inch-diameter stainless-steel Solinst Model 407 bladder pumps with polytetrafluoroethylene (Teflon) bladders installed in each well.

A sample could not be collected at monitoring well YVD-02; the well was dry during the groundwater monitoring event.

Sample Handling and Custody

All samples were accompanied by a chain-of-custody record according to procedures described in the 2018 QAPP. When custody of samples was transferred, the individuals relinquishing and receiving the samples signed and dated the chain-of-custody record. The chain-of-custody record documents the custody transfer from the sampler, often through another agent (e.g., a shipping/transport company), to the laboratory sample custodian.

All samples collected for laboratory analyses were delivered to ALS Environmental, located at 1317 S. 13th Ave. in Kelso, Washington. Two sample delivery groups (SDGs) were submitted to the analytical laboratory; the delivery group and collection date are as follows:

Sample Delivery Group	Samples Collected	Date Received by Laboratory
K2114499	December 14, 2021	December 15, 2021
K2114550	December 15, 2021	December 16, 2021

Field Sampling Data Sheets were completed for each sample and indicate what type of samples were collected, sample identification, sample bottle types and volumes collected, field parameter measurements, and other pertinent information (including significant events and observations that occurred during sampling activities). Enough information was noted on field sampling forms to enable participants to reconstruct events that occurred and to refresh the memory of field personnel, if needed. Original copies of all field forms and chain-of-custody documents were retained by the Yakima Valley Dairies'[1] (Dairies') Field Lead in the project files. Dairy owner certifications are included in Appendix B. Copies of the field forms from Fourth Quarter 2021 are presented in Appendix C.

Analytical Program

Corrective Actions

No corrective actions were required for the Fourth Quarter 2021 sampling event.

Data Review, Verification, and Validation

All data underwent a Stage 2 validation, which included a data package completeness review. Data were validated in accordance with the EPA *National Functional Guidelines for Superfund Organic Methods Data Review* (EPA 2014). The Data Validation Report (DVR) is presented in Appendix D. Any deviation from the 2018 QAPP was either documented within this memorandum or in the DVR. Results met project data quality goals and criteria and are usable for all purposes. Refer to Table 3

[1] Collectively, the following are referred to as the Yakima Valley Dairies: 1) Cow Palace, LLC; 2) D&A Dairy, LLC (also known as D and A Dairy L.L.C.), George DeRuyter & Son Dairy, LLC, and George & Margaret, LLC; and 3) Liberty Dairy, LLC, and its associated dairy facility H&S Bosma Dairy.

embedded in the DVR for a list of the qualified results from the data validation process. Qualified results include the following:

- The matrix spike and matrix spike duplicate performed on sample YVD-121421-02 (YVD-16) recovered above the control limit. Associated batch sample results were qualified "J" to indicate a high bias.
- Samples were received by the laboratory and initially analyzed for nitrate within hold times. For 15 of the samples, a dilution and reanalysis was required. These re-analyses were performed less than 1 day beyond the designated holding time. Associated results were qualified "UJ" or "J" to indicate they may be biased.

Groundwater Monitoring Results

Site Hydrogeology

The groundwater flow direction at the site is generally to the southwest at an average hydraulic gradient of 0.013 foot per foot. Hydraulic gradients are greater in the topographically higher areas in the northern section of the site, with an average of 0.026. As groundwater flows to the southwest toward the center of the Yakima River valley, hydraulic gradients decrease to approximately 0.011 in the central portion of the site and then decrease further to 0.004 in the southern portion of the site. The estimated average linear groundwater flow velocities for the shallow surficial aquifer at the Dairies range from 0.7 to 24.8 feet per day across the site. These estimated values are based on estimated conductivity values based on observed soil types and have not been confirmed with site-specific aquifer testing (e.g., slug tests).

A groundwater elevation contour map for the surficial aquifer based on Fourth Quarter 2021 depth to groundwater measurements is shown in Figure 1. Groundwater elevation measurements for Fourth Quarter 2021 and monitoring well construction details are provided in Tables 2 and 3, respectively. Historical groundwater elevations are provided in Table 4. Estimated possible average linear flow velocity values for Fourth Quarter 2021 are provided in Table 5. Groundwater hydrographs for all 26 wells are provided in Appendix A.

Groundwater Sampling Results

Groundwater field parameters collected during well purging included dissolved oxygen, pH, oxidation-reduction potential, specific conductance, temperature, and turbidity. Field parameter measurements are presented in Table 6.

Groundwater from the 17 wells sampled was analyzed for nitrate (as nitrogen).

The nitrate results for Fourth Quarter 2021 are presented spatially on a map in Figure 3 and are shown in Table 7. Historical nitrate concentrations since 2013 are presented in Figure 4 and plotted

in Figures 5 through 9. A summary of historical groundwater analytical results is presented in Table 8. Analytical laboratory reports are provided in Appendix E.

The monitoring well network includes wells that are located upgradient and downgradient of the Dairies. There are four groundwater monitoring wells located upgradient of the Dairy facilities' footprint. All four wells are screened at the water table. Historically, the nitrate concentrations in the four upgradient wells have been consistently below the nitrate maximum contaminant level (MCL) of 10 milligrams per liter (mg/L). As noted previously, YVD-02 was dry during Fourth Quarter 2021, and a sample could not be collected. YVD-02 is screened in a shallow basalt layer just downgradient of a former irrigation canal that has now been replaced by an enclosed pipe. After the open ditch was replaced by the piped conveyance, groundwater elevations decreased in the well until the well went dry; a sample has not been collected from YVD-02 since Second Quarter 2020.

Nitrate concentrations in the 14 downgradient monitoring wells that are screened at the water table for Fourth Quarter 2021 are as follows:

Downgradient Wells	Nitrate (mg/L)
DC-03	184
DC-04	35.1
DC-05	43.5
DC-07	20.3
DC-14	51.4
YVD-08	60.8
YVD-09	55.3
YVD-10	75.8
YVD-11	46.1
YVD-12	13.4
YVD-13	34.0
YVD-14R	118
YVD-15	15.1
YVD-16	19.7

Nitrate concentrations exceeded the MCL in all 14 of the downgradient water table wells tested during this monitoring event.

In two cases the patterns of groundwater nitrate concentrations may be responding to changes in groundwater infiltration and elevation patterns as follows:

- Nitrate was detected above the MCL in well DC-07 at a concentration of 20.3 mg/L. Nitrate concentrations in this well were historically below the MCL between 2013 and Second Quarter

2020. Since Second Quarter 2020, the MCL has been exceeded four times out of six completed monitoring events. The change in groundwater quality at this well follows the termination of clean chiller water discharges to a ditch located upgradient of the well. That chiller water discharge was terminated in late 2018. During the past six monitoring events, the measured nitrate levels in well DC-07 have averaged 14.2 mg/L. This is very similar to the average nitrate concentration in the well located immediately east (well YVD-15, average nitrate concentration 19.9 mg/L) during the same time period.

- During the Fourth Quarter 2021 monitoring event, nitrate was detected above the MCL in well DC-14 at a concentration of 51.4 mg/L. Between 2013 and June 2016, the nitrate concentrations in this well were highly variable, ranging from a low of 5.8 mg/L to a high of 26 mg/L. After a permanent pump was installed in the well prior to the September 2016 monitoring event, the groundwater nitrate concentrations decreased to below the MCL, reaching a minimum concentration of 2.41 mg/L in June of 2017. Nitrate concentrations have increased steadily quarter over quarter between September 2017 and December 2021. During this same time period, groundwater elevations have decreased approximately 7 feet in well DC-14. Taken together, the groundwater quality and elevation data suggest that groundwater stratification and changes in groundwater elevation (relative to the fixed pump elevation) may be affecting measured groundwater nitrate concentrations in well DC-14.

EPA has not yet approved formal trend analyses procedures for use with the project. See Figures 5 through 9 for plots of observed nitrate concentrations over time in the AOC monitoring wells.

Three downgradient groundwater monitoring wells were constructed with well screens positioned at depths that were estimated by EPA to approximate the depth of a typical residential drinking water well in the area. Each of these deeper wells was paired at the same location with a water table well. The results for each well pair, with the water table well listed above its deeper counterpart, are as follows:

Well Placement	Shallow/Deep Well Pair	Nitrate (mg/L)	Shallow/Deep Well Pair	Nitrate (mg/L)	Shallow/Deep Well Pair	Nitrate (mg/L)
Shallow Well	YVD-13	34.0	DC-03	184	DC-05	43.5
Deep Well	YVD-18	26.6	DC-03D	35.1	DC-05D	12.7

The results from all the well pairs show stratified conditions, with higher nitrate concentrations at the top of the water table and lower concentrations at depth. The nitrate concentrations in the YVD-13/YVD-18 well pair were approximately equal from First Quarter 2017 through Second Quarter 2019. Since Third Quarter 2019, nitrate concentrations in water table well YVD-13 have been generally increasing relative to the deeper well YVD-18. Nitrate concentrations in water table well DC-05 have historically been greater than deeper well DC-05D. Nitrate concentrations in water table well DC-03 remain higher than those in the paired deeper well DC-03D.

References

Anchor QEA (Anchor QEA, LLC), 2018. *Groundwater Monitoring Quality Assurance Project Plan*. Yakima Valley Dairies/SDWA-10-2013-0080. Prepared for Yakima Valley Dairies. February 2018.

EPA (U.S. Environmental Protection Agency), 2014. *National Functional Guidelines for Superfund Organic Methods Data Review*. Office of Superfund Remediation and Technology Innovation, U.S. Environmental Protection Agency, Washington, DC. EPA-540-R-014-002. August 2014.

Recipients

Adam Dolsen, Cow Palace, LLC
Dan DeRuyter, George DeRuyter & Son Dairy, LLC; D&A Dairy, LLC; George & Margaret, LLC
Henry Bosma, Liberty Dairy, LLC; H&S Bosma Dairy
Eric Winiecki, U.S. Environmental Protection Agency, Region 10
Rene Fuentes, U.S. Environmental Protection Agency, Region 10
Charles Clabaugh, U.S. Environmental Protection Agency, Region 10
Jennifer MacDonald, U.S. Environmental Protection Agency, Region 10
Meredith Weinberg, Perkins Coie LLP
Brendan Monahan, Stokes Lawrence PS
Lori Terri Gregory, Foster Pepper PLLC
Mark Larsen, Anchor QEA, LLC

Accompanying Materials

Tables

Table 1	Groundwater Monitoring Frequency
Table 2	Summary of Groundwater Elevations – Fourth Quarter 2021
Table 3	Monitoring Well Construction Details
Table 4	Historical Groundwater Elevations
Table 5	Estimated Possible Average Linear Groundwater Flow Velocities – Fourth Quarter 2021
Table 6	Field Parameter Measurements – Fourth Quarter 2021
Table 7	Groundwater Analytical Results – Fourth Quarter 2021
Table 8	Historical Groundwater Analytical Results

Figures

Figure 1	Surficial Aquifer Groundwater Elevation Contour Map Fourth Quarter 2021
Figure 2	Seasonal Groundwater Elevation Patterns
Figure 3	Nitrate Concentrations in Groundwater Fourth Quarter 2021
Figure 4	Historical Nitrate Concentrations in Groundwater

Figure 5 Nitrate Concentrations – East Downgradient Wells
Figure 6 Nitrate Concentrations – West Downgradient Wells
Figure 7 Nitrate Concentrations – Central Downgradient Wells
Figure 8 Nitrate Concentrations – Northern Downgradient Wells
Figure 9 Nitrate Concentrations – Upgradient Wells

Appendices

Appendix A Groundwater Hydrographs
Appendix B Owner Certifications
Appendix C Groundwater Sampling Records
Appendix D Data Validation Report
Appendix E Analytical Laboratory Reports

Appendix D
Data Validation Report

1201 3rd Avenue, Suite 2600
Seattle, Washington 98101
206.287.9130

ANCHOR QEA

Data Validation Report – EPA Stage 2A

January 13, 2022

Project: Yakima Valley Dairies

Project Number: 210996-01.01

Validation ID: AQ-2022-000007

This report summarizes the review of analytical results for 17 water samples, two field duplicate samples, and two field blank samples collected on December 14 and 15, 2021. The samples were collected by Anchor QEA, LLC, and submitted to ALS Environmental (ALS), in Kelso, Washington. The samples were analyzed Nitrate by U.S. Environmental Protection Agency (EPA) Method 300.0

ALS sample data groups (SDGs) K2114499 and K2114550 were reviewed in this report. Sample IDs, matrices, and analyses are presented in Table 1.

Table 1
Sample IDs, Matrices, and Analyses

Location ID	Sample ID	Lab Sample ID	Matrix	Analyses
FB	YVD-121421-01	K2114499-001	Water	Nitrate
YVD-16	YVD-121421-02	K2114499-002	Water	Nitrate
YVD-16 (FD)	YVD-121421-03	K2114499-003	Water	Nitrate
DC-05D	YVD-121421-04	K2114499-004	Water	Nitrate
YVD-11	YVD-121421-05	K2114499-005	Water	Nitrate
YVD-10	YVD-121421-06	K2114499-006	Water	Nitrate
YVD-15	YVD-121421-07	K2114499-007	Water	Nitrate
YVD-14R	YVD-121421-08	K2114499-008	Water	Nitrate
YVD-09	YVD-121421-09	K2114499-009	Water	Nitrate
DC-03D	YVD-121421-10	K2114499-010	Water	Nitrate
DC-03	YVD-121421-11	K2114499-011	Water	Nitrate
YVD-18	YVD-121521-12	K2114550-001	Water	Nitrate
FB	YVD-121521-13	K2114550-002	Water	Nitrate
YVD-18 (FD)	YVD-121521-14	K2114550-003	Water	Nitrate

Location ID	Sample ID	Lab Sample ID	Matrix	Analyses
DC-05	YVD-121521-15	K2114550-004	Water	Nitrate
YVD-13	YVD-121521-16	K2114550-005	Water	Nitrate
DC-07	YVD-121521-17	K2114550-006	Water	Nitrate
YVD-12	YVD-121521-18	K2114550-007	Water	Nitrate
DC-14	YVD-121521-19	K2114550-008	Water	Nitrate
YVD-08	YVD-121521-20	K2114550-009	Water	Nitrate
DC-04	YVD-121521-21	K2114550-010	Water	Nitrate

Notes:
FB: field blank
FD: field duplicate

Data Validation and Qualifications

The following comments refer to the laboratory's performance in meeting the quality assurance/quality control guidelines outlined in the analytical procedures. Laboratory results were reviewed using the laboratory control limits and the following guidelines:

- *Groundwater Monitoring Quality Assurance Project Plan, Addendum No. 1* (Anchor QEA 2016)
- *Groundwater Monitoring Quality Assurance Project Plan, Update No. 2* (Anchor QEA 2018)
- *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods* (EPA 1986)
- *National Functional Guidelines for Inorganic Superfund Data Review* (EPA 2020b)

Unless noted in this report, laboratory results for the samples listed in Table 1 were within quality control criteria.

Field Documentation

Field documentation was checked for completeness and accuracy. The chain-of-custody forms were signed by ALS at the time of sample receipt. Samples were received in good condition and within the recommended temperature range.

Holding Times and Sample Preservation

Samples were appropriately preserved and analyzed within holding times for all but 15 samples. Associated results were qualified "UJ" or "J" to indicate they may be biased.

Laboratory Method Blanks

Laboratory method blanks were analyzed at the required frequencies. All method blanks were free of target analytes.

Quality Control

Field Blanks

Two field blanks were collected in association with these sample sets and results were non-detect.

Field Duplicates

Two field duplicates were collected in association with these sample sets. Detected results are summarized in Table 2.

Result values less than five times the reporting limit (RL) may have exaggerated relative percent difference (RPD) values; therefore, if the sample or field duplicate result was less than five times the RL, the sample result was evaluated by the difference between them using the RL as the control limit. All RPD and/or difference values were within control limits for both duplicate sets.

Table 2
Field Duplicate Summary

Analyte	YVD-121421-02	YVD-121421-03	RPD
Nitrate	19.7 mg/L	20.1 mg/L	2%

Analyte	YVD-121521-12	YVD-121521-14	RPD
Nitrate	26.6 mg/L	26.7 mg/L	0%

Notes:
mg/L: milligrams per liter

Laboratory Control Samples

Laboratory control samples were analyzed at the required frequencies, and all analyses resulted in recovery values within project-required control limits.

Matrix Spike and Matrix Spike Duplicate Samples

Matrix spike (MS) samples and matrix spike duplicate (MSD) samples were analyzed at a frequency of one per 20 field samples analyzed. MS/MSD analyses conducted on non-project samples were not included in this evaluation. No data were qualified when sample concentrations were greater than four times the spike concentrations. The MS and MSD performed on sample YVD-121421-02 (YVD-16) recovered above the control limit. and MS/MSD. Associated batch sample results were qualified "J" to indicate a high bias.

Laboratory Duplicates

Laboratory duplicates were analyzed at the required frequencies and the duplicate RPDs were within project control limits. Laboratory duplicates analyzed on non-project samples were not included in this evaluation.

Method Reporting Limits

RLs were acceptable as reported. All values below detection were reported using the laboratory RLs. Values were reported as undiluted, or when reported as diluted, the RL accurately reflects the dilution factor.

Overall Assessment

As was determined by this evaluation, the laboratory followed the specified analytical methods, and all requested sample analyses were completed. Accuracy was acceptable as demonstrated by the laboratory control sample and MS/MSD recovery values, with the exceptions noted above. Precision was acceptable as demonstrated by the field duplicates and MS/MSD RPD values or difference values, with the exceptions noted above. All data are acceptable as reported or as qualified. Qualified data are summarized in Table 3. Project completeness was 100%.

Data Qualifier Definitions

UJ Indicates the compound or analyte was analyzed for but not detected and the specified limit reported is estimated
J Indicates an estimated value

Table 3
Data Qualification Summary

Sample ID	Parameter	Analyte	Reported Result	Qualified Result	Reason
YVD-121421-02	Conventionals	Nitrate as nitrogen	19.7 mg/L	19.7J mg/L	Hold time exceedance, MS/MSD %R above CL
YVD-121421-04	Conventionals	Nitrate as nitrogen	12.7 mg/L	12.7J mg/L	Hold time exceedance, MS/MSD %R above CL
YVD-121421-08	Conventionals	Nitrate as nitrogen	118 mg/L	118J mg/L	Hold time exceedance, MS/MSD %R above CL
YVD-121421-09	Conventionals	Nitrate as nitrogen	55.3 mg/L	55.3J mg/L	Hold time exceedance, MS/MSD %R above CL

Sample ID	Parameter	Analyte	Reported Result	Qualified Result	Reason
YVD-121421-11	Conventionals	Nitrate as nitrogen	184 mg/L	184J mg/L	Hold time exceedance, MS/MSD %R above CL
YVD-121521-12	Conventionals	Nitrate as nitrogen	26.6 mg/L	26.6J mg/L	Hold time exceedance, MS/MSD %R above CL
YVD-121521-13	Conventionals	Nitrate as nitrogen	0.1U mg/L	0.1UJ mg/L	Hold time exceedance
YVD-121521-14	Conventionals	Nitrate as nitrogen	26.7 mg/L	26.7J mg/L	Hold time exceedance, MS/MSD %R above CL
YVD-121521-15	Conventionals	Nitrate as nitrogen	43.5 mg/L	43.5J mg/L	Hold time exceedance, MS/MSD %R above CL
YVD-121521-16	Conventionals	Nitrate as nitrogen	34 mg/L	34J mg/L	Hold time exceedance, MS/MSD %R above CL
YVD-121521-17	Conventionals	Nitrate as nitrogen	20.3 mg/L	20.3J mg/L	Hold time exceedance, MS/MSD %R above CL
YVD-121521-18	Conventionals	Nitrate as nitrogen	13.4 mg/L	13.4J mg/L	Hold time exceedance, MS/MSD %R above CL
YVD-121521-19	Conventionals	Nitrate as nitrogen	51.4 mg/L	51.4J mg/L	Hold time exceedance, MS/MSD %R above CL
YVD-121521-20	Conventionals	Nitrate as nitrogen	60.8 mg/L	60.8J mg/L	Hold time exceedance, MS/MSD %R above CL
YVD-121521-21	Conventionals	Nitrate as nitrogen	32.7 mg/L	32.7J mg/L	Hold time exceedance, MS/MSD %R above CL

Notes:
%R: percent recovery
CL: control limit

References

Anchor QEA (Anchor QEA, LLC), 2016. *Groundwater Monitoring Quality Assurance Project Plan, Addendum No. 1*. Prepared for Yakima Valley Dairies. November 2016.

Anchor QEA, 2018. *Groundwater Monitoring Quality Assurance Project Plan, Update No. 2*. Prepared for Yakima Valley Dairies. March 2018.

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USEPA, 2020b. National Functional Guidelines for Inorganic Superfund Methods Data Review. Office of Superfund Remediation and Technology Innovation. EPA-542-R-20-006. November 2020.

Eric Winiecki Declaration
Exhibit K

949 Market Street, Suite 700
Tacoma, Washington 98402
206.287.9130

ANCHOR QEA

August 21, 2023

Eric Winiecki
United States Environmental Protection Agency
Region 10
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101-3140

Re: Second Quarter 2023 Groundwater Monitoring Data Report, Yakima Valley Dairies, SDWA-10-2013-0080

This quarterly groundwater monitoring report (report) has been prepared to supplement groundwater data collection initiated under the Administrative Order on Consent (AOC) Statement of Work.

The AOC requires 8 years of quarterly groundwater monitoring, which was completed in Second Quarter 2021. Under the AOC, this 8-year monitoring period is to be followed by data evaluation and a formal determination of next steps. This data evaluation process is ongoing.

Pending completion of the data evaluation process and definition of next steps under the AOC, the U.S. Environmental Protection Agency (EPA) and the Respondents to the AOC exchanged correspondence regarding the value of conducting continued nitrate monitoring. The monitoring data contained in this report were collected voluntarily consistent with a written proposal made by the Respondents in a letter to EPA dated October 4, 2021, and repeated in follow-up letters dated November 11, 2021, and December 10, 2021. In the December 10, 2021, letter, the Respondents informed EPA that they planned to continue voluntary groundwater monitoring beginning in Fourth Quarter 2021, and therefore the Second Quarter 2023 groundwater monitoring event was voluntarily conducted.

EPA replied to the Respondents' groundwater monitoring proposal in a letter dated January 25, 2022. In that letter, EPA stated that the AOC did not require continued groundwater monitoring at this time but that it was consistent with the goals of the AOC.

The Second Quarter 2023 groundwater monitoring event was conducted on June 4, 2023 (depth-to-water measurement event), and on June 19 through 21, 2023 (groundwater sampling).

Groundwater monitoring was conducted using methods defined in the 2018 *Groundwater Monitoring Quality Assurance Project Plan* (QAPP; Anchor QEA 2018). Deviations from the QAPP as part of the Second Quarter 2023 monitoring event were as follows:

- Monitoring was performed on the subset of wells identified in the October 4, 2021, proposal from the Respondents to EPA. This excluded those wells that were dry and certain wells that

have been consistently below the nitrate maximum contaminant level (MCL) for at least the preceding eight monitoring events.

- Monitoring parameters were limited to those identified in the October 4, 2021, proposal from the Respondents to EPA and included groundwater elevation, groundwater field parameters, and nitrate concentrations.

The locations of the monitoring wells are shown in Figure 1. The wells monitored in the current event are listed in Table 1.

Groundwater Monitoring Activities

Depth to Static Water Level Measurement

Water level measurements were collected from all 26 wells in the monitoring network on June 4, 2023, using an electronic water level meter. The depths to water were measured to the nearest 0.01 foot from the indicated reference point on each well casing and recorded on the Water Level Survey Form presented in Appendix D of the 2018 QAPP. The depth-to-water measurements were collected from the 26 wells in as short a time period as possible (approximately 8 hours) to provide a "snapshot" of groundwater elevations and to reduce the effect of atmospheric pressure changes or precipitation events on the water levels. Depth-to-water measurements were converted to groundwater elevations in the North American Vertical Datum of 1988 (NAVD88) by subtracting the measurements from the surveyed reference point elevation for each well. The depth-to-water measurements and calculated groundwater elevations for Second Quarter 2023 are shown in Table 2.

Groundwater Elevation Trends

Non-vented Solinst Levelogger Junior Edge pressure transducers were initially installed in six wells (YVD-03, YVD-08, YVD-11, DC-03, DC-05, and DC-05D), along with a Solinst Barologger Edge barometric pressure transducer deployed at well YVD-08 to compensate water levels for atmospheric pressure. However, the transducers are no longer operational due to equipment failures.

Groundwater elevation trends continue to be monitored using the quarterly groundwater elevation measurements. Groundwater hydrographs developed from these data are included in Appendix A of this report for all wells.

Groundwater Elevation Seasonal Patterns

The hydrographs for many of the monitoring wells show a seasonal pattern of water level increases and decreases. For example, the water level in monitoring well YVD-02 historically increased about 12 feet from first quarter to second quarter before an adjacent irrigation ditch was converted to a closed pipe, after which the seasonal pattern became less pronounced and the well eventually went dry.

Another example of seasonal water level fluctuation is observed in well YVD-17, which is located adjacent to the large, unlined Southside irrigation canal run by the Sunnyside Valley Irrigation District (Figure 1). According to the District fact sheet, irrigation usually runs from April 1 through October 20 with canal priming operations beginning in mid-March. The water elevation in YVD-17 varies seasonally by about 6 feet. The lowest water level of each year has consistently occurred in the first quarter (approximately April 1), and the highest water level of each year has consistently occurred in the third quarter (approximately October 1). This suggests that the travel time of water from the flowing irrigation canal to the relatively shallow drinking water aquifer at YVD-17 is likely in the range of days to weeks.

EPA has concluded that the seasonal fluctuations observed at monitoring wells indicate that percolation of water from the land surface to the aquifer can and does occur in a range of days to months. The time of travel depends on many factors including the soil type, existing amount of water in the soil, the duration and amount of water, evapotranspiration, and depth to the water table. The percolating water could originate from surface water such as a canal or pond, excess irrigation water from a field, an earthen lagoon, precipitation, or some other source. The groundwater elevation seasonal patterns for each monitoring well are shown in Figure 2 and the following table:

Monitoring Well ID	Clear Seasonal Pattern? (Y/N)	Well Depth from Ground Surface to Mid-Point of Screen (feet)	Highest Groundwater Elevation in 3Q (Fall) and Lowest in 1Q (Spring)	Highest Groundwater Elevation in 4Q (Winter) and Lowest in 2Q (Summer)	Highest Groundwater Elevation in 1Q (Spring) and Lowest in 3Q (Fall)
YVD-17	Y	38	X		
DC-04	Y	40	X		
DC-07	Y	49		X	
DC-03	Y	73	X		
DC-05	Y	74		X	
YVD-14R	Y	81		X	
YVD-10	Y	93			X
YVD-15	Y	95		X	
YVD-11	N	107			
DC-03D	Y	111	X		
YVD-09	N	112			
YVD-16	Y	112			X
DC-05D	Y	122		X	
YVD-13	Y	131		X	
DC-14	N	139			
YVD-12	Y	141			X
DC-01	N	150			

Monitoring Well ID	Clear Seasonal Pattern? (Y/N)	Well Depth from Ground Surface to Mid-Point of Screen (feet)	Highest Groundwater Elevation in 3Q (Fall) and Lowest in 1Q (Spring)	Highest Groundwater Elevation in 4Q (Winter) and Lowest in 2Q (Summer)	Highest Groundwater Elevation in 1Q (Spring) and Lowest in 3Q (Fall)
YVD-07	Y	158			X
YVD-06	Y	159			X
YVD-05	Y	172			X
YVD-08	Y	172			X
YVD-18	Y	175		X	
DC-09	Y	184			X
YVD-03	Y	190			X
YVD-04	Y	235			X

Sample Collection

Groundwater samples were collected using low-flow purging and sampling procedures described in the Standard Operating Procedure entitled *Low-Flow Groundwater Purging and Sampling Procedures for Monitoring Wells* presented in Appendix E of the 2018 QAPP.

Purging and sampling of the monitoring wells were performed with dedicated 1-inch-diameter stainless-steel Solinst Model 407 bladder pumps with polytetrafluoroethylene (Teflon) bladders installed in each well.

A sample could not be collected at monitoring well YVD-02; the well was dry during the groundwater monitoring event.

Sample Handling and Custody

All samples were accompanied by a chain-of-custody record according to procedures described in the 2018 QAPP. When custody of samples was transferred, the individuals relinquishing and receiving the samples signed and dated the chain-of-custody record. The chain-of-custody record documents the custody transfer from the sampler, often through another agent (e.g., a shipping/transport company), to the laboratory sample custodian.

All samples collected for laboratory analyses were delivered to ALS Environmental, located at 1317 S. 13th Ave. in Kelso, Washington. Two sample delivery groups were submitted to the analytical laboratory; the delivery groups and collection dates are as follows:

Sample Delivery Group	Samples Collected	Date Received by Laboratory
K2307010	June 19 and 20, 2023	June 21, 2023
K2307093	June 20 and 21, 2023	June 22, 2023

Field Sampling Data Sheets were completed for each sample and indicate what type of samples were collected, sample identification, sample bottle types and volumes collected, field parameter measurements, and other pertinent information (including significant events and observations that occurred during sampling activities). Enough information was noted on field sampling forms to enable participants to reconstruct events that occurred and to refresh the memory of field personnel, if needed. Original copies of all field forms and chain-of-custody documents were retained by the Yakima Valley Dairies'[1] Field Lead in the project files. Dairy owner certifications are included in Appendix B. Copies of the field forms from Second Quarter 2023 are presented in Appendix C.

Analytical Program

Corrective Actions

No corrective actions were required for the Second Quarter 2023 sampling event.

Data Review, Verification, and Validation

All data underwent a Stage 2 validation, which included a data package completeness review. Data were validated in accordance with the EPA *National Functional Guidelines for Superfund Organic Methods Data Review* (EPA 2014). The Data Validation Report (DVR) is presented in Appendix D. Any deviation from the 2018 QAPP was either documented within this memorandum or in the DVR. Results met project data quality goals and criteria and are usable for all purposes.

All samples for nitrate were analyzed outside of the EPA Method 300.0 48-hour hold time. As a result, all results were assigned a "J" qualifier to indicate that they are estimated values.

[1] Collectively, the following are referred to as the Yakima Valley Dairies: 1) Cow Palace, LLC; 2) D&A Dairy, LLC (also known as D and A Dairy L.L.C.), George DeRuyter & Son Dairy, LLC, and George & Margaret, LLC; and 3) Liberty Dairy, LLC, and its associated dairy facility H&S Bosma Dairy.

Groundwater Monitoring Results

Site Hydrogeology

The groundwater flow direction at the site is generally to the southwest at an average hydraulic gradient of 0.013.[2] Hydraulic gradients are greater in the topographically higher areas in the northern section of the site, with an average of 0.026. As groundwater flows to the southwest toward the center of the Yakima River valley, hydraulic gradients decrease to approximately 0.011 in the central portion of the site and then decrease further to 0.004 in the southern portion of the site. The estimated average linear groundwater flow velocities for the shallow surficial aquifer at the Dairies range from 0.7 to 24.8 feet per day across the site. These estimated values are based on estimated hydraulic conductivity values based on observed soil types and have not been confirmed with site-specific aquifer testing (e.g., slug tests).

A groundwater elevation contour map for the surficial aquifer based on Second Quarter 2023 depth to groundwater measurements is shown in Figure 1. Groundwater elevation measurements for Second Quarter 2023 and monitoring well construction details are provided in Tables 2 and 3, respectively. Historical groundwater elevations are provided in Table 4. Estimated possible average linear flow velocity values for Second Quarter 2023 are provided in Table 5. Groundwater hydrographs for all 26 wells are provided in Appendix A.

Groundwater Sampling Results

Groundwater field parameters collected during well purging included dissolved oxygen, pH, oxidation-reduction potential, specific conductance, temperature, and turbidity. Field parameter measurements are presented in Table 6.

Groundwater from the 17 wells sampled was analyzed for nitrate (as nitrogen) by EPA Method 300.0.

The nitrate results for Second Quarter 2023 are presented spatially on a map in Figure 3 and are shown in Table 7. Historical nitrate concentrations from 2013 through 2017 are presented in Figure 4a and from 2018 to present in Figure 4b. Nitrate concentration trend plots are presented in Figures 5 through 9. A summary of historical groundwater analytical results is presented in Table 8. Analytical laboratory reports are provided in Appendix E.

The monitoring well network includes wells that are located upgradient and downgradient of the Dairies. There are four groundwater monitoring wells located upgradient of the Dairy facilities' footprint. All four wells are screened at the water table. Historically, the nitrate concentrations in the four upgradient wells have been consistently below the nitrate MCL of 10 milligrams per liter (mg/L). As noted previously, YVD-02 was dry during Second Quarter 2023, and a sample could not be

[2] Hydraulic gradients values are in units of vertical feet per horizontal feet and are presented unitless.

collected. YVD-02 is screened in a shallow basalt layer just downgradient of a former irrigation canal that has now been replaced by an enclosed pipe. After the open ditch was replaced by the piped conveyance, groundwater elevations decreased in the well until the well went dry; a sample has not been collected from YVD-02 since Second Quarter 2020.

Nitrate concentrations reported in mg/L in the upgradient monitoring wells for Second Quarter 2023 are as follows:

Upgradient Well	Nitrate (mg/L)
DC-01	7.79 J
YVD-02	Not Sampled
YVD-03	4.97 J
YVD-04	3.93 J

Nitrate concentrations in the 19 downgradient monitoring wells that are screened at the water table for Second Quarter 2023 are as follows:

Downgradient Water Table Wells	Nitrate (mg/L)
DC-03	130 J
DC-04	27.6 J
DC-05	33.9 J
DC-07	2.50 J
DC-09	6.23 J
DC-14	50.5 J
YVD-05	6.18 J
YVD-06	0.76 J
YVD-07	4.15 J
YVD-08	54.3 J
YVD-09	63.6 J
YVD-10	66.1 J
YVD-11	80.8 J
YVD-12	20.5 J
YVD-13	35.0 J
YVD-14R	117 J
YVD-15	12.4 J
YVD-16	24.8 J
YVD-17	0.62 J

Note:
J: estimated value

All nitrate concentrations in the upgradient wells were below the MCL. Nitrate concentrations were below the MCL in 6 of the 19 downgradient water table wells tested during this monitoring event.

Recent trends in nitrate concentrations include the following:

- The nitrate concentration of 130 mg/L at well DC-03 in Second Quarter 2023 was the lowest historical nitrate concentration detected since monitoring began in 2013. The three historically lowest concentrations have been detected in the previous three quarters (138 mg/L in Fourth Quarter 2022, 140 mg/L in First Quarter 2023, and 130 mg/L in Second Quarter 2023).
- Nitrate concentrations at well DC-07 have been below the MCL for three consecutive quarters after being above the MCL for seven of the ten previous quarters.
- Nitrate concentrations have decreased for four consecutive quarters at well DC-14 (from 57.4 mg/L in Second Quarter 2022 to 50.5 mg/L in Second Quarter 2023). Data indicate that the increasing trend noted between 2018 and 2022 in this well has terminated.
- The two previous quarters of nitrate concentrations at well YVD-08 of 47.8 mg/L in First Quarter 2023 and 54.3 mg/L in Second Quarter 2023 were its two lowest concentrations since First Quarter 2018.

EPA has not yet approved formal trend analyses procedures for use with the project. See Figures 5 through 9 for plots of observed nitrate concentrations over time in the AOC monitoring wells.

Three downgradient groundwater monitoring wells were constructed with well screens positioned at depths that were estimated by EPA to approximate the depth of a typical residential drinking water well in the area. Each of these deeper wells was paired at the same location with a water table well. The results for each well pair, with the water table well listed above its deeper counterpart, are as follows:

Well Placement	Shallow/Deep Well Pair	Nitrate (mg/L)	Shallow/Deep Well Pair	Nitrate (mg/L)	Shallow/Deep Well Pair	Nitrate (mg/L)
Shallow Well	YVD-13	35.0	DC-03	130	DC-05	33.9
Deep Well	YVD-18	32.1	DC-03D	36.0	DC-05D	11.2

The results from all the well pairs indicate stratified conditions, with generally higher nitrate concentrations at the top of the water table and lower concentrations at depth. Nitrate concentration trends at well pairs are detailed as follows:

- The nitrate concentrations in the YVD-13/YVD-18 well pair were initially higher in the shallow well (YVD-13) but then approximately equal from First Quarter 2017 through Second Quarter 2019. Since Third Quarter 2019, nitrate concentrations in water table well YVD-13 have been slightly higher than those in the deeper well YVD-18.

- Nitrate concentrations in water table well DC-05 have historically been greater than co-located deeper well DC-05D. The concentrations in well DC-05 were 33.9 mg/L in Second Quarter 2023; the nitrate concentration in DC-05D in Second Quarter 2023 was just above the MCL at 11.2 mg/L.
- Nitrate concentrations in water table well DC-03 have decreased significantly since First Quarter 2022 to a concentration of 130 mg/L in Second Quarter 2023. Nitrate concentrations in well DC-03D remain much lower.

References

Anchor QEA (Anchor QEA, LLC), 2018. *Groundwater Monitoring Quality Assurance Project Plan*. Yakima Valley Dairies/SDWA-10-2013-0080. Prepared for Yakima Valley Dairies. February 2018.

EPA (U.S. Environmental Protection Agency), 2014. *National Functional Guidelines for Superfund Organic Methods Data Review*. Office of Superfund Remediation and Technology Innovation, U.S. Environmental Protection Agency, Washington, DC. EPA-540-R-014-002. August 2014.

Recipients

Adam Dolsen, Cow Palace, LLC
Dan DeRuyter, George DeRuyter & Son Dairy, LLC; D&A Dairy, LLC; George & Margaret, LLC
Henry Bosma, Liberty Dairy, LLC; H&S Bosma Dairy
Eric Winiecki, U.S. Environmental Protection Agency, Region 10
Charles Clabaugh, U.S. Environmental Protection Agency, Region 10
Jennifer MacDonald, U.S. Environmental Protection Agency, Region 10
John (Matthew) Moore, U.S. Environmental Protection Agency, Region 10
Meredith Weinberg, Perkins Coie LLP
Brendan Monahan, Stokes Lawrence PS
Lori Terri Gregory, Foster Pepper PLLC
Mark Larsen, Anchor QEA, LLC

Accompanying Materials

Tables

Table 1	Groundwater Monitoring Frequency
Table 2	Summary of Groundwater Elevations – Second Quarter 2023
Table 3	Monitoring Well Construction Details
Table 4	Historical Groundwater Elevations
Table 5	Estimated Possible Average Linear Groundwater Flow Velocities – Second Quarter 2023
Table 6	Field Parameter Measurements – Second Quarter 2023

Table 7 Groundwater Analytical Results – Second Quarter 2023
Table 8 Historical Groundwater Analytical Results

Figures

Figure 1 Surficial Aquifer Groundwater Elevation Contour Map Second Quarter 2023
Figure 2 Seasonal Groundwater Elevation Patterns
Figure 3 Nitrate Concentrations in Groundwater Second Quarter 2023
Figure 4a Historical Nitrate Concentrations in Groundwater – 2013 through 2017
Figure 4b Historical Nitrate Concentrations in Groundwater – 2018 to present
Figure 5 Nitrate Concentrations – East Downgradient Wells
Figure 6 Nitrate Concentrations – West Downgradient Wells
Figure 7 Nitrate Concentrations – Central Downgradient Wells
Figure 8 Nitrate Concentrations – Northern Downgradient Wells
Figure 9 Nitrate Concentrations – Upgradient Wells

Appendices

Appendix A Groundwater Hydrographs
Appendix B Owner Certifications
Appendix C Groundwater Sampling Records
Appendix D Data Validation Report
Appendix E Analytical Laboratory Reports

Tables

Table 1
Groundwater Monitoring Frequency

Well ID	Manual Groundwater Elevation Measurements (Quarterly)	Long-Term Groundwater Elevation Measurements (Every Quarter Hour)	Groundwater Sampling Frequency	
			Quarterly	Annually (Second Quarter Event)
DC-01	X			X
DC-03	X	X	X	X
DC-03D	X		X	X
DC-04	X		X	X
DC-05	X	X[3]	X	X
DC-05D	X	X[3]	X	X
DC-07	X		X	X
DC-09	X			X
DC-14	X		X	X
YVD-02[2]	X		X[2]	X[2]
YVD-03	X	X[1]		X
YVD-04	X			X
YVD-05	X			X
YVD-06	X			X
YVD-07	X			X
YVD-08	X	X[1]	X	X
YVD-09	X		X	X
YVD-10	X		X	X
YVD-11	X	X[3]	X	X
YVD-12	X		X	X
YVD-13	X		X	X
YVD-14R	X		X	X
YVD-15	X		X	X
YVD-16	X		X	X
YVD-17	X			X
YVD-18	X		X	X

Notes:
1. These wells currently do not have installed transducers. The transducers in these two wells fell down the wells on December 14, 2021, and have not been recovered or replaced.
2. YVD-02 has been dry since Second Quarter 2020 and cannot currently be sampled.
3. These wells currently do not have installed transducers. The transducers in these two wells would not connect to the downloading device and were sent to the manufacturer for data extraction. The transducers have not been replaced in the wells.

Table 2
Summary of Groundwater Elevations – Second Quarter 2023

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
DC-01	6/4/2023	1199.17	151.12	1048.05
DC-03	6/4/2023	910.58	77.61	832.97
DC-03D	6/4/2023	911.33	78.27	833.06
DC-04	6/4/2023	877.22	40.05	837.17
DC-05	6/4/2023	911.95	75.21	836.74
DC-05D	6/4/2023	915.91	78.91	837.00
DC-07	6/4/2023	889.29	49.98	839.31
DC-09	6/4/2023	1048.60	164.23	884.37
DC-14	6/4/2023	1036.61	139.12	897.49
YVD-02	6/4/2023	1288.97	Dry	--
YVD-03	6/4/2023	1120.68	197.29	923.39
YVD-04	6/4/2023	1118.66	231.28	887.38
YVD-05	6/4/2023	1051.78	175.15	876.63
YVD-06	6/4/2023	1053.51	110.20	943.31
YVD-07	6/4/2023	1073.03	158.18	914.85
YVD-08	6/4/2023	1014.38	176.44	837.94
YVD-09	6/4/2023	966.81	115.33	851.48
YVD-10	6/4/2023	958.00	95.84	862.16
YVD-11	6/4/2023	967.91	112.17	855.74
YVD-12	6/4/2023	961.91	142.38	819.53
YVD-13	6/4/2023	965.59	131.70	833.89
YVD-14R	6/4/2023	921.41	82.86	838.55
YVD-15	6/4/2023	940.61	98.05	842.56
YVD-16	6/4/2023	975.90	120.48	855.42
YVD-17	6/4/2023	866.73	39.70	827.03
YVD-18	6/4/2023	965.74	131.89	833.85

Notes:

BTOC: below top of casing

NAVD88: North American Vertical Datum of 1988

Table 3
Monitoring Well Construction Details

Well ID	Coordinates		Top of Casing Elevation (feet NAVD88)	Ground Surface Elevation (feet NAVD88)	Surface Completion	Well Depth (feet bgs)	Casing and Screen Material	Screen Slot Size (inches)	Screen Length (feet)	Depth to Top of Screen (feet bgs)	Depth to Bottom of Screen (feet bgs)	Elevation of Top of Screen (feet NAVD88)	Elevation of Base of Screen (feet NAVD88)	Depth to Top of Filter Pack (feet bgs)	Depth to Bottom of Filter Pack (feet bgs)
	Latitude	Longitude													
Monitoring Wells															
DC-01	46.418795	-120.138185	1199.17	1199.64	Flush	160.0	Schedule 40 PVC	0.020	20.0	140.0	160.0	1059.6	1039.6	136.0	160.0
DC-03	46.386289	-120.146145	910.58	911.04	Flush	85.0	Schedule 40 PVC	0.020	20.0	62.5	82.5	848.5	828.5	58.5	85.0
DC-03D	46.386220	-120.146054	911.33	908.83	Stick-up	116.1	Schedule 40 PVC	0.020	9.5	106.1	115.6	802.7	793.2	100.0	116.5
DC-04	46.382446	-120.131129	877.22	877.62	Flush	51.0	Schedule 40 PVC	0.020	20.0	29.5	49.5	848.1	828.1	24.5	51.0
DC-05	46.382358	-120.120237	911.95	912.35	Flush	86.0	Schedule 40 PVC	0.020	20.0	63.5	83.5	848.9	828.9	59.5	86.0
DC-05D	46.382517	-120.120210	915.91	913.55	Stick-up	126.8	Schedule 40 PVC	0.020	9.5	116.8	126.3	796.8	787.3	114.0	128.0
DC-07	46.389612	-120.141671	889.29	889.78	Flush	61.0	Schedule 40 PVC	0.020	20.0	38.5	58.5	851.3	831.3	34.5	61.0
DC-09	46.404230	-120.120858	1048.60	1048.97	Flush	196.0	Schedule 40 PVC	0.020	20.0	173.5	193.5	875.5	855.5	169.5	196.0
DC-14	46.404240	-120.139685	1036.61	1036.92	Flush	151.0	Schedule 40 PVC	0.020	20.0	128.5	148.5	908.4	888.4	124.5	151.0
YVD-02	46.422601	-120.113697	1288.97	1285.81	Stick-up	35.0	Schedule 40 PVC	0.020	19.5	15.0	34.5	1270.8	1251.3	13.0	36.0
YVD-03	46.414227	-120.139638	1120.68	1118.15	Stick-up	200.1	Schedule 40 PVC	0.020	19.5	180.1	199.6	938.1	918.6	176.0	202.0
YVD-04	46.408062	-120.156224	1118.66	1116.06	Stick-up	245.2	Schedule 40 PVC	0.020	19.5	225.2	244.7	890.9	871.4	220.0	248.0
YVD-05	46.404457	-120.142790	1051.78	1052.26	Flush	182.2	Schedule 40 PVC	0.020	19.5	162.2	181.7	890.1	870.6	156.0	208.0
YVD-06	46.407671	-120.137191	1053.51	1053.88	Flush	169.0	Schedule 40 PVC	0.020	19.5	149.0	168.5	904.9	885.4	144.0	170.0
YVD-07	46.404432	-120.125205	1073.03	1070.59	Stick-up	168.3	Schedule 40 PVC	0.020	19.5	148.3	167.8	922.3	902.8	145.0	169.0
YVD-08	46.396920	-120.152771	1014.38	1011.92	Stick-up	182.5	Schedule 40 PVC	0.020	19.5	162.5	182.0	849.4	829.9	155.0	188.0
YVD-09	46.396832	-120.144078	966.81	964.28	Stick-up	122.3	Schedule 40 PVC	0.020	19.5	102.3	121.8	862.0	842.5	9.5	128.0
YVD-10	46.396978	-120.136165	958.00	955.45	Stick-up	103.1	Schedule 40 PVC	0.020	19.5	83.1	102.6	872.4	852.9	76.0	103.5
YVD-11	46.393446	-120.123627	967.91	965.51	Stick-up	116.9	Schedule 40 PVC	0.020	19.5	96.9	116.4	868.6	849.1	94.0	117.3
YVD-12	46.389730	-120.166996	961.91	959.51	Stick-up	151.4	Schedule 40 PVC	0.020	19.5	131.4	150.9	828.1	808.6	127.0	154.0
YVD-13	46.389708	-120.151673	965.59	963.07	Stick-up	141.0	Schedule 40 PVC	0.020	19.5	121.0	140.5	842.1	822.6	117.0	148.0
YVD-14R	46.389532	-120.145124	920.19	918.80	Stick-up	93.0	Schedule 40 PVC	0.020	20.0	72.0	92.0	846.8	826.8	69.0	93.0
YVD-15	46.389802	-120.137153	940.61	938.08	Stick-up	105.1	Schedule 40 PVC	0.020	19.5	85.1	104.6	853.0	833.5	81.0	128.0
YVD-16	46.389586	-120.114783	975.90	972.99	Stick-up	122.1	Schedule 40 PVC	0.020	19.5	102.1	121.6	870.9	851.4	100.5	127.0
YVD-17	46.380761	-120.142067	866.73	864.28	Stick-up	47.7	Schedule 40 PVC	0.020	19.5	27.7	47.2	836.6	817.1	25.0	58.0
YVD-18	46.389758	-120.151671	965.74	963.42	Stick-up	179.9	Schedule 40 PVC	0.020	9.5	169.9	179.4	793.5	784.0	166.0	181.5
Decommissioned Wells															
YVD-14	46.389536	-120.145067	920.19	917.64	Stick-up	91.0	Schedule 40 PVC	0.020	19.5	71.0	90.5	846.6	827.1	66.0	98.0

Notes:
Latitude and longitude in decimal degrees based on World Geodetic Survey 1984.
bgs: below ground surface
NAVD88: North American Vertical Datum of 1988
PVC: polyvinyl chloride

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
DC-01	9/16/2013	1199.17	150.45	1048.72
DC-01	12/9/2013	1199.17	150.66	1048.51
DC-01	3/16/2014	1199.17	150.43	1048.74
DC-01	6/1/2014	1199.17	150.50	1048.67
DC-01	9/21/2014	1199.17	150.32	1048.85
DC-01	12/14/2014	1199.17	150.20	1048.97
DC-01	3/5/2015	1199.17	150.35	1048.82
DC-01	6/15/2015	1199.17	150.41	1048.76
DC-01	9/21/2015	1199.17	150.50	1048.67
DC-01	12/13/2015	1199.17	150.46	1048.71
DC-01	3/8/2016	1199.17	150.53	1048.64
DC-01	6/19/2016	1199.17	150.70	1048.47
DC-01	9/25/2016	1199.17	150.70	1048.47
DC-01	12/11/2016	1199.17	150.65	1048.52
DC-01	3/5/2017	1199.17	150.55	1048.62
DC-01	6/4/2017	1199.17	150.68	1048.49
DC-01	9/27/2017	1199.17	150.81	1048.36
DC-01	12/3/2017	1199.17	150.74	1048.43
DC-01	3/18/2018	1199.17	150.74	1048.43
DC-01	6/3/2018	1199.17	150.74	1048.43
DC-01	9/8/2018	1199.17	150.44	1048.73
DC-01	12/9/2018	1199.17	150.94	1048.23
DC-01	3/21/2019	1199.17	150.78	1048.39
DC-01	6/1/2019	1199.17	150.85	1048.32
DC-01	9/8/2019	1199.17	150.77	1048.40
DC-01	12/8/2019	1199.17	150.79	1048.38
DC-01	3/29/2020	1199.17	150.74	1048.43
DC-01	6/7/2020	1199.17	150.87	1048.30
DC-01	9/20/2020	1199.17	150.97	1048.20
DC-01	12/6/2020	1199.17	151.06	1048.11
DC-01	2/28/2021	1199.17	150.99	1048.18
DC-01	6/6/2021	1199.17	150.86	1048.31
DC-01	9/20/2021	1199.17	151.13	1048.04
DC-01	12/14/2021	1199.17	150.85	1048.32
DC-01	3/14/2022	1199.17	150.95	1048.22
DC-01	6/5/2022	1199.17	150.84	1048.33
DC-01	9/12/2022	1199.17	151.07	1048.10
DC-01	12/5/2022	1199.17	151.10	1048.07
DC-01	3/5/2023	1199.17	151.02	1048.15
DC-01	6/4/2023	1199.17	151.12	1048.05
DC-03	9/16/2013	910.58	72.43	838.15
DC-03	12/9/2013	910.58	72.55	838.03

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
DC-03	3/16/2014	910.58	73.62	836.96
DC-03	6/1/2014	910.58	73.25	837.33
DC-03	9/21/2014	910.58	72.26	838.32
DC-03	12/14/2014	910.58	72.40	838.18
DC-03	3/5/2015	910.58	73.60	836.98
DC-03	6/15/2015	910.58	73.12	837.46
DC-03	9/21/2015	910.58	72.35	838.23
DC-03	12/13/2015	910.58	73.64	837.94
DC-03	3/8/2016	910.58	73.99	836.59
DC-03	6/19/2016	910.58	73.84	836.74
DC-03	9/25/2016	910.58	72.87	837.71
DC-03	12/11/2016	910.58	72.93	837.65
DC-03	3/5/2017	910.58	74.20	836.38
DC-03	6/4/2017	910.58	74.21	836.37
DC-03	9/27/2017	910.58	72.81	837.77
DC-03	12/3/2017	910.58	73.11	837.47
DC-03	3/18/2018	910.58	74.54	836.04
DC-03	6/3/2018	910.58	74.08	836.50
DC-03	9/8/2018	910.58	73.24	837.34
DC-03	12/9/2018	910.58	73.32	837.26
DC-03	3/21/2019	910.58	75.01	835.57
DC-03	6/1/2019	910.58	74.94	835.64
DC-03	9/8/2019	910.58	73.95	836.63
DC-03	12/8/2019	910.58	74.10	836.48
DC-03	3/29/2020	910.58	75.90	834.68
DC-03	6/7/2020	910.58	75.52	835.06
DC-03	9/20/2020	910.58	74.46	836.12
DC-03	12/6/2020	910.58	74.56	836.02
DC-03	2/28/2021	910.58	75.94	834.64
DC-03	6/6/2021	910.58	75.89	834.69
DC-03	9/20/2021	910.58	74.90	835.68
DC-03	12/14/2021	910.58	75.22	835.36
DC-03	3/14/2022	910.58	76.71	833.87
DC-03	6/5/2022	910.58	76.44	834.14
DC-03	9/12/2022	910.58	75.79	834.79
DC-03	12/5/2022	910.58	75.91	834.67
DC-03	3/5/2023	910.58	77.45	833.13
DC-03	6/4/2023	910.58	77.61	832.97
DC-03D	9/16/2013	911.33	73.03	838.30
DC-03D	12/9/2013	911.33	73.16	838.17
DC-03D	3/16/2014	911.33	74.35	836.98
DC-03D	6/1/2014	911.33	73.90	837.43

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
DC-03D	9/21/2014	911.33	72.87	838.46
DC-03D	12/14/2014	911.33	73.13	838.20
DC-03D	3/5/2015	911.33	74.28	837.05
DC-03D	6/15/2015	911.33	73.72	837.61
DC-03D	9/21/2015	911.33	72.96	838.37
DC-03D	12/13/2015	911.33	73.31	838.02
DC-03D	3/8/2016	911.33	74.66	836.67
DC-03D	6/19/2016	911.33	74.47	836.86
DC-03D	9/25/2016	911.33	73.44	837.89
DC-03D	12/11/2016	911.33	73.73	837.60
DC-03D	3/5/2017	911.33	75.05	836.28
DC-03D	6/4/2017	911.33	74.88	836.45
DC-03D	9/27/2017	911.33	73.42	837.91
DC-03D	12/3/2017	911.33	73.80	837.53
DC-03D	3/18/2018	911.33	75.30	836.03
DC-03D	6/3/2018	911.33	74.82	836.51
DC-03D	9/8/2018	911.33	73.78	837.55
DC-03D	12/9/2018	911.33	74.01	837.32
DC-03D	3/21/2019	911.33	75.75	835.58
DC-03D	6/1/2019	911.33	75.65	835.68
DC-03D	9/8/2019	911.33	74.55	836.78
DC-03D	12/8/2019	911.33	74.79	836.54
DC-03D	3/29/2020	911.33	76.49	834.84
DC-03D	6/7/2020	911.33	76.19	835.14
DC-03D	9/20/2020	911.33	75.06	836.27
DC-03D	12/6/2020	911.33	75.24	836.09
DC-03D	2/28/2021	911.33	76.66	834.67
DC-03D	6/6/2021	911.33	76.57	834.76
DC-03D	9/20/2021	911.33	75.53	835.80
DC-03D	12/14/2021	911.33	75.88	835.45
DC-03D	3/14/2022	911.33	77.42	833.91
DC-03D	6/5/2022	911.33	77.11	834.22
DC-03D	9/12/2022	911.33	76.46	834.87
DC-03D	12/5/2022	911.33	76.51	834.82
DC-03D	3/5/2023	911.33	78.14	833.19
DC-03D	6/4/2023	911.33	78.27	833.06
DC-04	9/16/2013	877.22	31.75	845.47
DC-04	12/9/2013	877.22	32.61	844.61
DC-04	3/16/2014	877.22	34.55	842.67
DC-04	6/1/2014	877.22	34.65	842.57
DC-04	9/21/2014	877.22	31.99	845.23
DC-04	12/14/2014	877.22	32.98	844.24

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
DC-04	3/5/2015	877.22	34.31	842.91
DC-04	6/15/2015	877.22	34.70	842.52
DC-04	9/21/2015	877.22	33.61	843.61
DC-04	12/13/2015	877.22	34.38	842.84
DC-04	3/8/2016	877.22	35.60	841.62
DC-04	6/19/2016	877.22	34.74	842.48
DC-04	9/25/2016	877.22	33.81	843.41
DC-04	12/11/2016	877.22	34.33	842.89
DC-04	3/5/2017	877.22	35.45	841.77
DC-04	6/4/2017	877.22	35.63	841.59
DC-04	9/27/2017	877.22	34.42	842.80
DC-04	12/3/2017	877.22	35.17	842.05
DC-04	3/18/2018	877.22	36.89	840.33
DC-04	6/3/2018	877.22	37.17	840.05
DC-04	9/8/2018	877.22	36.45	840.77
DC-04	12/9/2018	877.22	36.17	841.05
DC-04	3/21/2019	877.22	37.73	839.49
DC-04	6/1/2019	877.22	38.20	839.02
DC-04	9/8/2019	877.22	36.96	840.26
DC-04	12/8/2019	877.22	36.83	840.39
DC-04	3/29/2020	877.22	38.37	838.85
DC-04	6/7/2020	877.22	38.58	838.64
DC-04	9/20/2020	877.22	37.23	839.99
DC-04	12/6/2020	877.22	36.76	840.46
DC-04	2/28/2021	877.22	38.35	838.87
DC-04	6/6/2021	877.22	39.12	838.10
DC-04	9/20/2021	877.22	38.19	839.03
DC-04	12/14/2021	877.22	37.91	839.31
DC-04	3/14/2022	877.22	39.32	837.90
DC-04	6/5/2022	877.22	39.47	837.75
DC-04	9/12/2022	877.22	38.50	838.72
DC-04	12/5/2022	877.22	38.05	839.17
DC-04	3/5/2023	877.22	39.51	837.71
DC-04	6/4/2023	877.22	40.05	837.17
DC-05	9/16/2013	911.95	67.78	844.17
DC-05	12/9/2013	911.95	68.28	843.67
DC-05	3/16/2014	911.95	69.25	842.70
DC-05	6/1/2014	911.95	70.15	841.80
DC-05	9/21/2014	911.95	69.43	842.52
DC-05	12/14/2014	911.95	68.80	843.15
DC-05	3/5/2015	911.95	69.33	842.62
DC-05	6/15/2015	911.95	70.28	841.67

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
DC-05	9/21/2015	911.95	69.94	842.01
DC-05	12/13/2015	911.95	69.59	842.36
DC-05	3/8/2016	911.95	70.58	841.37
DC-05	6/19/2016	911.95	71.43	840.52
DC-05	9/25/2016	911.95	71.08	840.87
DC-05	12/11/2016	911.95	70.24	841.71
DC-05	3/5/2017	911.95	70.98	840.97
DC-05	6/4/2017	911.95	71.81	840.14
DC-05	9/27/2017	911.95	71.14	840.81
DC-05	12/3/2017	911.95	70.50	841.45
DC-05	3/18/2018	911.95	71.06	840.89
DC-05	6/3/2018	911.95	71.33	840.62
DC-05	9/8/2018	911.95	71.39	840.56
DC-05	12/9/2018	911.95	70.82	841.13
DC-05	3/21/2019	911.95	71.46	840.49
DC-05	6/1/2019	911.95	71.95	840.00
DC-05	9/8/2019	911.95	72.09	839.86
DC-05	12/8/2019	911.95	71.47	840.48
DC-05	3/29/2020	911.95	72.43	839.52
DC-05	6/7/2020	911.95	73.11	838.84
DC-05	9/20/2020	911.95	73.38	838.57
DC-05	12/6/2020	911.95	73.03	838.92
DC-05	2/28/2021	911.95	73.97	837.98
DC-05	6/6/2021	911.95	74.88	837.07
DC-05	9/20/2021	911.95	74.92	837.03
DC-05	12/14/2021	911.95	74.08	837.87
DC-05	3/14/2022	911.95	74.52	837.43
DC-05	6/5/2022	911.95	74.21	837.74
DC-05	9/12/2022	911.95	73.95	838.00
DC-05	12/5/2022	911.95	71.45	840.50
DC-05	3/5/2023	911.95	73.70	838.25
DC-05	6/4/2023	911.95	75.21	836.74
DC-05D	9/16/2013	915.91	71.92	843.99
DC-05D	12/9/2013	915.91	72.04	843.87
DC-05D	3/16/2014	915.91	73.83	842.08
DC-05D	6/1/2014	915.91	74.80	841.11
DC-05D	9/21/2014	915.91	73.78	842.13
DC-05D	12/14/2014	915.91	73.02	842.89
DC-05D	3/5/2015	915.91	73.66	842.25
DC-05D	6/15/2015	915.91	74.71	841.20
DC-05D	9/21/2015	915.91	74.38	841.53
DC-05D	12/13/2015	915.91	73.88	842.03

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
DC-05D	3/8/2016	915.91	74.70	841.21
DC-05D	6/19/2016	915.91	75.71	840.20
DC-05D	9/25/2016	915.91	75.40	840.51
DC-05D	12/11/2016	915.91	74.65	841.26
DC-05D	3/5/2017	915.91	74.96	840.95
DC-05D	6/4/2017	915.91	75.94	839.97
DC-05D	9/27/2017	915.91	75.47	840.44
DC-05D	12/3/2017	915.91	74.64	841.27
DC-05D	3/18/2018	915.91	75.43	840.48
DC-05D	6/3/2018	915.91	75.46	840.45
DC-05D	9/8/2018	915.91	75.54	840.37
DC-05D	12/9/2018	915.91	75.00	840.91
DC-05D	3/21/2019	915.91	75.30	840.61
DC-05D	6/1/2019	915.91	76.26	839.65
DC-05D	9/8/2019	915.91	76.17	839.74
DC-05D	12/8/2019	915.91	75.37	840.54
DC-05D	3/29/2020	915.91	76.38	839.53
DC-05D	6/7/2020	915.91	77.36	838.55
DC-05D	9/20/2020	915.91	77.85	838.06
DC-05D	12/6/2020	915.91	77.21	838.70
DC-05D	2/28/2021	915.91	78.68	837.23
DC-05D	6/6/2021	915.91	79.28	836.63
DC-05D	9/20/2021	915.91	79.44	836.47
DC-05D	12/14/2021	915.91	78.26	837.65
DC-05D	3/14/2022	915.91	78.28	837.63
DC-05D	6/5/2022	915.91	77.36	838.55
DC-05D	9/12/2022	915.91	76.52	839.39
DC-05D	12/5/2022	915.91	71.99	843.92
DC-05D	3/5/2023	915.91	77.39	838.52
DC-05D	6/4/2023	915.91	78.91	837.00
DC-07	9/16/2013	889.29	44.76	844.53
DC-07	12/9/2013	889.29	44.15	845.14
DC-07	3/16/2014	889.29	44.76	844.53
DC-07	6/1/2014	889.29	35.12[1]	---
DC-07	9/21/2014	889.29	44.59	844.70
DC-07	12/14/2014	889.29	44.13	845.16
DC-07	3/5/2015	889.29	44.90	844.39
DC-07	6/15/2015	889.29	45.30	843.99
DC-07	9/21/2015	889.29	45.08	844.21
DC-07	12/13/2015	889.29	44.65	844.64
DC-07	3/8/2016	889.29	45.50	843.79
DC-07	6/19/2016	889.29	46.16	843.13

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
DC-07	9/25/2016	889.29	45.69	843.60
DC-07	12/11/2016	889.29	45.61	843.68
DC-07	3/5/2017	889.29	46.27	843.02
DC-07	6/4/2017	889.29	46.54	842.75
DC-07	9/27/2017	889.29	46.11	843.18
DC-07	12/3/2017	889.29	45.73	843.56
DC-07	3/18/2018	889.29	46.45	842.84
DC-07	6/3/2018	889.29	46.76	842.53
DC-07	9/8/2018	889.29	46.32	842.97
DC-07	12/9/2018	889.29	46.09	843.20
DC-07	3/21/2019	889.29	46.94	842.35
DC-07	6/1/2019	889.29	47.36	841.93
DC-07	9/8/2019	889.29	46.79	842.50
DC-07	12/8/2019	889.29	46.68	842.61
DC-07	3/29/2020	889.29	47.65	841.64
DC-07	6/7/2020	889.29	48.04	841.25
DC-07	7/13/2020	889.29	48.06	841.23
DC-07	9/20/2020	889.29	47.80	841.49
DC-07	12/6/2020	889.29	47.51	841.78
DC-07	2/28/2021	889.29	48.12	841.17
DC-07	6/6/2021	889.29	48.69	840.60
DC-07	9/20/2021	889.29	48.17	841.12
DC-07	12/14/2021	889.29	48.05	841.24
DC-07	3/14/2022	889.29	48.81	840.48
DC-07	6/5/2022	889.29	49.25	840.04
DC-07	9/12/2022	889.29	49.03	840.26
DC-07	12/5/2022	889.29	48.57	840.72
DC-07	3/5/2023	889.29	49.70	839.59
DC-07	6/4/2023	889.29	49.98	839.31
DC-09	9/16/2013	1048.60	147.16	901.44
DC-09	12/9/2013	1048.60	143.10	905.50
DC-09	3/16/2014	1048.60	139.81	908.79
DC-09	6/1/2014	1048.60	142.53	906.07
DC-09	9/21/2014	1048.60	143.67	904.93
DC-09	12/14/2014	1048.60	139.42	909.18
DC-09	3/5/2015	1048.60	137.83	910.77
DC-09	6/15/2015	1048.60	146.33	902.27
DC-09	9/21/2015	1048.60	151.28	897.32
DC-09	12/13/2015	1048.60	147.46	901.14
DC-09	3/8/2016	1048.60	146.70	901.90
DC-09	6/19/2016	1048.60	151.03	897.57
DC-09	9/25/2016	1048.60	151.98	896.62

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
DC-09	12/11/2016	1048.60	148.71	899.89
DC-09	3/5/2017	1048.60	146.24	902.36
DC-09	6/4/2017	1048.60	148.62	899.98
DC-09	9/27/2017	1048.60	151.56	897.04
DC-09	12/3/2017	1048.60	149.27	899.33
DC-09	3/18/2018	1048.60	146.19	902.41
DC-09	6/3/2018	1048.60	149.27	899.33
DC-09	9/8/2018	1048.60	151.66	896.94
DC-09	12/9/2018	1048.60	149.99	898.61
DC-09	3/21/2019	1048.60	148.87	899.73
DC-09	6/1/2019	1048.60	151.32	897.28
DC-09	9/8/2019	1048.60	155.69	892.91
DC-09	12/8/2019	1048.60	155.23	893.37
DC-09	3/29/2020	1048.60	156.53	892.07
DC-09	6/7/2020	1048.60	157.91	890.69
DC-09	9/20/2020	1048.60	161.02	887.58
DC-09	12/6/2020	1048.60	160.56	888.04
DC-09	2/28/2021	1048.60	159.29	889.31
DC-09	6/6/2021	1048.60	161.68	886.92
DC-09	9/20/2021	1048.60	164.74	883.86
DC-09	12/14/2021	1048.60	163.15	885.45
DC-09	3/14/2022	1048.60	162.89	885.71
DC-09	6/5/2022	1048.60	164.10	884.50
DC-09	9/12/2022	1048.60	166.79	881.81
DC-09	12/5/2022	1048.60	165.30	883.30
DC-09	3/5/2023	1048.60	163.17	885.43
DC-09	6/4/2023	1048.60	164.23	884.37
DC-14	9/16/2013	1036.61	131.08	905.53
DC-14	12/9/2013	1036.61	131.10	905.51
DC-14	3/16/2014	1036.61	130.32	906.29
DC-14	6/1/2014	1036.61	130.02	906.59
DC-14	9/21/2014	1036.61	130.25	906.36
DC-14	12/14/2014	1036.61	137.91[1]	---
DC-14	3/5/2015	1036.61	129.51	907.10
DC-14	6/15/2015	1036.61	129.37	907.24
DC-14	9/21/2015	1036.61	130.28	906.33
DC-14	12/13/2015	1036.61	130.71	905.90
DC-14	3/8/2016	1036.61	131.26	905.35
DC-14	6/19/2016	1036.61	131.89	904.72
DC-14	9/25/2016	1036.61	132.76	903.85
DC-14	12/11/2016	1036.61	133.45	903.16
DC-14	3/5/2017	1036.61	133.81	902.80

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
DC-14	6/4/2017	1036.61	133.81	902.80
DC-14	9/27/2017	1036.61	134.16	902.45
DC-14	12/3/2017	1036.61	134.48	902.13
DC-14	3/18/2018	1036.61	133.83	902.78
DC-14	6/3/2018	1036.61	133.35	903.26
DC-14	9/8/2018	1036.61	133.67	902.94
DC-14	12/9/2018	1036.61	133.67	902.94
DC-14	3/21/2019	1036.61	133.24	903.37
DC-14	6/1/2019	1036.61	132.98	903.63
DC-14	9/8/2019	1036.61	133.72	902.89
DC-14	12/8/2019	1036.61	134.60	902.01
DC-14	3/29/2020	1036.61	135.10	901.51
DC-14	6/7/2020	1036.61	135.56	901.05
DC-14	9/20/2020	1036.61	136.54	900.07
DC-14	12/6/2020	1036.61	137.45	899.16
DC-14	2/28/2021	1036.61	138.02	898.59
DC-14	6/6/2021	1036.61	138.28	898.33
DC-14	9/20/2021	1036.61	139.06	897.55
DC-14	12/14/2021	1036.61	139.58	897.03
DC-14	3/14/2022	1036.61	139.27	897.34
DC-14	6/5/2022	1036.61	139.03	897.58
DC-14	9/12/2022	1036.61	139.70	896.91
DC-14	12/5/2022	1036.61	139.84	896.77
DC-14	3/5/2023	1036.61	139.67	896.94
DC-14	6/4/2023	1036.61	139.12	897.49
YVD-02	9/16/2013	1288.97	24.21	1264.76
YVD-02	12/9/2013	1288.97	32.85	1256.12
YVD-02	3/16/2014	1288.97	34.45	1254.52
YVD-02	6/1/2014	1288.97	22.10	1266.87
YVD-02	9/21/2014	1288.97	26.14	1262.83
YVD-02	12/14/2014	1288.97	33.01	1255.96
YVD-02	3/5/2015	1288.97	34.42	1254.55
YVD-02	6/15/2015	1288.97	19.69	1269.28
YVD-02	9/21/2015	1288.97	25.36	1263.61
YVD-02	12/13/2015	1288.97	33.25	1255.72
YVD-02	3/8/2016	1288.97	33.93	1255.04
YVD-02	6/19/2016	1288.97	27.49	1261.48
YVD-02	9/25/2016	1288.97	27.72	1261.25
YVD-02	12/11/2016	1288.97	32.52	1256.45
YVD-02	3/5/2017	1288.97	27.34	1261.63
YVD-02	6/4/2017	1288.97	26.97	1262.00
YVD-02	9/27/2017	1288.97	28.08	1260.89

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-02	12/3/2017	1288.97	33.83	1255.14
YVD-02	3/18/2018	1288.97	34.07	1254.90
YVD-02	6/3/2018	1288.97	33.78	1255.19
YVD-02	9/8/2018	1288.97	29.19	1259.78
YVD-02	12/9/2018	1288.97	33.17	1255.80
YVD-02	3/21/2019	1288.97	34.44	1254.53
YVD-02	6/1/2019	1288.97	30.68	1258.29
YVD-02	9/8/2019	1288.97	32.34	1256.63
YVD-02	12/8/2019	1288.97	33.92	1255.05
YVD-02	3/29/2020	1288.97	35.49	1253.48
YVD-02	6/7/2020	1288.97	37.44	1251.53
YVD-02	7/13/2020	1288.97	37.68	1251.29
YVD-02	9/19/2020	1288.97	37.94	1251.03
YVD-02	12/6/2020	1288.97	dry	---
YVD-02	2/28/2021	1288.97	37.93	1251.04
YVD-02	6/6/2021	1288.97	dry	---
YVD-02	9/20/2021	1288.97	dry	---
YVD-02	12/14/2021	1288.97	dry	---
YVD-02	3/14/2022	1288.97	dry	---
YVD-02	6/5/2022	1288.97	dry	---
YVD-02	9/12/2022	1288.97	dry	---
YVD-02	12/5/2022	1288.97	dry	---
YVD-02	3/5/2023	1288.97	dry	---
YVD-02	6/4/2023	1288.97	dry	---
YVD-03	9/16/2013	1120.68	189.88	930.80
YVD-03	12/9/2013	1120.68	190.42	930.26
YVD-03	3/16/2014	1120.68	189.10	931.58
YVD-03	6/1/2014	1120.68	188.97	931.71
YVD-03	9/21/2014	1120.68	189.04	931.64
YVD-03	12/14/2014	1120.68	188.73	931.95
YVD-03	3/5/2015	1120.68	187.92	932.76
YVD-03	6/15/2015	1120.68	188.70	931.98
YVD-03	9/21/2015	1120.68	189.63	931.05
YVD-03	12/13/2015	1120.68	189.85	930.83
YVD-03	3/8/2016	1120.68	190.64	930.04
YVD-03	6/19/2016	1120.68	191.31	929.37
YVD-03	9/25/2016	1120.68	191.61	929.07
YVD-03	12/11/2016	1120.68	191.25	929.43
YVD-03	3/5/2017	1120.68	190.85	929.83
YVD-03	6/4/2017	1120.68	191.20	929.48
YVD-03	9/27/2017	1120.68	191.77	928.91
YVD-03	12/3/2017	1120.68	191.61	929.07

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-03	3/18/2018	1120.68	191.55	929.13
YVD-03	6/3/2018	1120.68	191.40	929.28
YVD-03	9/8/2018	1120.68	191.96	928.72
YVD-03	12/9/2018	1120.68	192.59	928.09
YVD-03	3/21/2019	1120.68	191.86	928.82
YVD-03	6/1/2019	1120.68	191.85	928.83
YVD-03	9/8/2019	1120.68	192.53	928.15
YVD-03	12/8/2019	1120.68	193.62	927.06
YVD-03	3/29/2020	1120.68	193.93	926.75
YVD-03	6/7/2020	1120.68	194.17	926.51
YVD-03	9/20/2020	1120.68	195.07	925.61
YVD-03	11/19/2020	1120.68	195.78	924.90
YVD-03	12/6/2020	1120.68	195.75	924.93
YVD-03	2/28/2021	1120.68	195.80	924.88
YVD-03	6/6/2021	1120.68	195.50	925.18
YVD-03	9/20/2021	1120.68	196.18	924.50
YVD-03	12/14/2021	1120.68	195.94	924.74
YVD-03	3/14/2022	1120.68	196.42	924.26
YVD-03	6/5/2022	1120.68	196.15	924.53
YVD-03	9/12/2022	1120.68	197.06	923.62
YVD-03	12/5/2022	1120.68	197.11	923.57
YVD-03	3/5/2023	1120.68	197.05	923.63
YVD-03	6/4/2023	1120.68	197.29	923.39
YVD-04	9/16/2013	1118.66	220.55	898.11
YVD-04	12/9/2013	1118.66	223.50	895.16
YVD-04	3/16/2014	1118.66	222.20	896.46
YVD-04	6/1/2014	1118.66	221.04	897.62
YVD-04	9/21/2014	1118.66	220.67	897.99
YVD-04	12/14/2014	1118.66	221.30	897.36
YVD-04	3/5/2015	1118.66	220.72	897.94
YVD-04	6/15/2015	1118.66	221.61	897.05
YVD-04	9/21/2015	1118.66	221.99	896.67
YVD-04	12/13/2015	1118.66	221.71	896.95
YVD-04	3/8/2016	1118.66	220.74	897.92
YVD-04	6/19/2016	1118.66	221.50	897.16
YVD-04	9/25/2016	1118.66	221.05	897.61
YVD-04	12/11/2016	1118.66	221.07	897.59
YVD-04	3/5/2017	1118.66	220.89	897.77
YVD-04	6/4/2017	1118.66	221.83	896.83
YVD-04	9/27/2017	1118.66	222.49	896.17
YVD-04	12/3/2017	1118.66	222.38	896.28
YVD-04	3/18/2018	1118.66	222.37	896.29

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-04	6/3/2018	1118.66	222.04	896.62
YVD-04	9/8/2018	1118.66	222.29	896.37
YVD-04	12/9/2018	1118.66	222.36	896.30
YVD-04	3/21/2019	1118.66	221.67	896.99
YVD-04	6/1/2019	1118.66	221.71	896.95
YVD-04	9/8/2019	1118.66	222.06	896.60
YVD-04	12/8/2019	1118.66	222.31	896.35
YVD-04	3/29/2020	1118.66	222.47	896.19
YVD-04	6/7/2020	1118.66	222.76	895.90
YVD-04	9/20/2020	1118.66	223.52	895.14
YVD-04	12/6/2020	1118.66	224.24	894.42
YVD-04	2/28/2021	1118.66	224.39	894.27
YVD-04	6/6/2021	1118.66	224.48	894.18
YVD-04	9/20/2021	1118.66	225.71	892.95
YVD-04	12/14/2021	1118.66	225.63	893.03
YVD-04	3/14/2022	1118.66	226.81	891.85
YVD-04	6/5/2022	1118.66	227.54	891.12
YVD-04	9/12/2022	1118.66	229.62	889.04
YVD-04	12/5/2022	1118.66	230.28	888.38
YVD-04	3/5/2023	1118.66	230.47	888.19
YVD-04	6/4/2023	1118.66	231.28	887.38
YVD-05	9/16/2013	1051.78	167.50	884.28
YVD-05	12/9/2013	1051.78	166.35	885.43
YVD-05	3/16/2014	1051.78	165.40	886.38
YVD-05	6/1/2014	1051.78	165.58	886.20
YVD-05	9/21/2014	1051.78	166.01	885.77
YVD-05	12/14/2014	1051.78	165.35	886.43
YVD-05	3/5/2015	1051.78	164.86	886.92
YVD-05	6/15/2015	1051.78	166.04	885.74
YVD-05	9/21/2015	1051.78	168.04	883.74
YVD-05	12/13/2015	1051.78	167.75	884.03
YVD-05	3/8/2016	1051.78	167.71	884.07
YVD-05	6/19/2016	1051.78	168.45	883.33
YVD-05	9/25/2016	1051.78	168.97	882.81
YVD-05	12/11/2016	1051.78	168.51	883.27
YVD-05	3/5/2017	1051.78	167.98	883.80
YVD-05	6/4/2017	1051.78	168.07	883.71
YVD-05	9/27/2017	1051.78	169.83	881.95
YVD-05	12/3/2017	1051.78	169.67	882.11
YVD-05	3/18/2018	1051.78	169.38	882.40
YVD-05	6/3/2018	1051.78	169.45	882.33
YVD-05	9/8/2018	1051.78	169.85	881.93

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-05	12/9/2018	1051.78	169.44	882.34
YVD-05	3/21/2019	1051.78	168.86	882.92
YVD-05	6/1/2019	1051.78	169.06	882.72
YVD-05	9/8/2019	1051.78	170.22	881.56
YVD-05	12/8/2019	1051.78	170.62	881.16
YVD-05	3/29/2020	1051.78	171.06	880.72
YVD-05	6/7/2020	1051.78	171.58	880.20
YVD-05	9/20/2020	1051.78	172.53	879.25
YVD-05	12/6/2020	1051.78	172.95	878.83
YVD-05	2/28/2021	1051.78	173.05	878.73
YVD-05	6/6/2021	1051.78	173.39	878.39
YVD-05	9/20/2021	1051.78	NM[2]	---
YVD-05	12/14/2021	1051.78	174.20	877.58
YVD-05	3/14/2022	1051.78	174.19	877.59
YVD-05	6/5/2022	1051.78	174.32	877.46
YVD-05	9/12/2022	1051.78	175.22	876.56
YVD-05	12/5/2022	1051.78	175.35	876.43
YVD-05	3/5/2023	1051.78	175.05	876.73
YVD-05	6/4/2023	1051.78	175.15	876.63
YVD-06	9/16/2013	1053.51	110.65	942.86
YVD-06	12/9/2013	1053.51	108.21	945.30
YVD-06	3/16/2014	1053.51	105.98	947.53
YVD-06	6/1/2014	1053.51	106.49	947.02
YVD-06	9/21/2014	1053.51	108.02	945.49
YVD-06	12/14/2014	1053.51	106.32	947.19
YVD-06	3/5/2015	1053.51	104.68	948.83
YVD-06	6/15/2015	1053.51	106.37	947.14
YVD-06	9/21/2015	1053.51	109.01	944.50
YVD-06	12/13/2015	1053.51	108.72	944.79
YVD-06	3/8/2016	1053.51	108.90	944.61
YVD-06	6/19/2016	1053.51	111.03	942.48
YVD-06	9/25/2016	1053.51	112.05	941.46
YVD-06	12/15/2016	1053.51	109.70	943.81
YVD-06	3/5/2017	1053.51	107.89	945.62
YVD-06	6/4/2017	1053.51	109.14	944.37
YVD-06	9/27/2017	1053.51	110.99	942.52
YVD-06	12/3/2017	1053.51	109.30	944.21
YVD-06	3/18/2018	1053.51	106.37	947.14
YVD-06	6/3/2018	1053.51	108.02	945.49
YVD-06	9/8/2018	1053.51	109.87	943.64
YVD-06	12/9/2018	1053.51	107.99	945.52
YVD-06	3/21/2019	1053.51	106.86	946.65

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-06	6/1/2019	1053.51	108.32	945.19
YVD-06	9/8/2019	1053.51	110.95	942.56
YVD-06	12/8/2019	1053.51	111.11	942.40
YVD-06	3/29/2020	1053.51	110.92	942.59
YVD-06	6/7/2020	1053.51	112.14	941.37
YVD-06	9/20/2020	1053.51	113.89	939.62
YVD-06	12/6/2020	1053.51	113.00	940.51
YVD-06	2/28/2021	1053.51	111.71	941.80
YVD-06	6/6/2021	1053.51	112.36	941.15
YVD-06	9/20/2021	1053.51	113.89	939.62
YVD-06	12/14/2021	1053.51	111.58	941.93
YVD-06	3/14/2022	1053.51	110.29	943.22
YVD-06	6/5/2022	1053.51	111.01	942.50
YVD-06	9/12/2022	1053.51	112.62	940.89
YVD-06	12/5/2022	1053.51	111.18	942.33
YVD-06	3/5/2023	1053.51	109.35	944.16
YVD-06	6/4/2023	1053.51	110.20	943.31
YVD-07	9/16/2013	1073.03	157.99	915.04
YVD-07	12/9/2013	1073.03	157.26	915.77
YVD-07	3/16/2014	1073.03	153.95	919.08
YVD-07	6/1/2014	1073.03	153.87	919.16
YVD-07	9/21/2014	1073.03	155.93	917.10
YVD-07	12/14/2014	1073.03	155.40	917.63
YVD-07	3/5/2015	1073.03	153.42	919.61
YVD-07	6/15/2015	1073.03	154.30	918.73
YVD-07	9/21/2015	1073.03	157.09	915.94
YVD-07	12/13/2015	1073.03	158.05	914.98
YVD-07	3/8/2016	1073.03	157.96	915.07
YVD-07	6/19/2016	1073.03	158.75	914.28
YVD-07	9/25/2016	1073.03	160.29	912.74
YVD-07	12/11/2016	1073.03	160.00	913.03
YVD-07	3/5/2017	1073.03	157.59	915.44
YVD-07	6/4/2017	1073.03	157.56	915.47
YVD-07	9/27/2017	1073.03	159.81	913.22
YVD-07	12/3/2017	1073.03	159.30	913.73
YVD-07	3/18/2018	1073.03	156.76	916.27
YVD-07	6/3/2018	1073.03	156.44	916.59
YVD-07	9/8/2018	1073.03	158.22	914.81
YVD-07	12/9/2018	1073.03	158.27	914.76
YVD-07	3/21/2019	1073.03	156.58	916.45
YVD-07	6/1/2019	1073.03	157.05	915.98
YVD-07	9/8/2019	1073.03	159.06	913.97

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-07	12/8/2019	1073.03	160.48	912.55
YVD-07	3/29/2020	1073.03	159.62	913.41
YVD-07	6/7/2020	1073.03	160.42	912.61
YVD-07	9/20/2020	1073.03	162.61	910.42
YVD-07	12/6/2020	1073.03	164.10	908.93
YVD-07	2/28/2021	1073.03	162.27	910.76
YVD-07	6/6/2021	1073.03	161.15	911.88
YVD-07	9/20/2021	1073.03	163.83	909.20
YVD-07	12/14/2021	1073.03	163.66	909.37
YVD-07	3/14/2022	1073.03	159.94	913.09
YVD-07	6/5/2022	1073.03	159.47	913.56
YVD-07	9/12/2022	1073.03	161.24	911.79
YVD-07	12/5/2022	1073.03	161.72	911.31
YVD-07	3/5/2023	1073.03	158.98	914.05
YVD-07	6/4/2023	1073.03	158.18	914.85
YVD-08	9/16/2013	1014.38	170.83	843.55
YVD-08	12/9/2013	1014.38	171.08	843.30
YVD-08	3/16/2014	1014.38	170.66	843.72
YVD-08	6/1/2014	1014.38	170.50	843.88
YVD-08	9/21/2014	1014.38	170.50	843.88
YVD-08	12/14/2014	1014.38	170.22	844.16
YVD-08	3/5/2015	1014.38	169.83	844.55
YVD-08	6/15/2015	1014.38	170.13	844.25
YVD-08	9/21/2015	1014.38	170.67	843.71
YVD-08	12/13/2015	1014.38	170.63	843.75
YVD-08	3/8/2016	1014.38	171.00	843.38
YVD-08	6/19/2016	1014.38	171.51	842.87
YVD-08	9/25/2016	1014.38	171.75	842.63
YVD-08	12/11/2016	1014.38	171.52	842.86
YVD-08	3/5/2017	1014.38	171.16	843.22
YVD-08	6/4/2017	1014.38	171.87	842.51
YVD-08	9/27/2017	1014.38	172.30	842.08
YVD-08	12/3/2017	1014.38	171.95	842.43
YVD-08	3/18/2018	1014.38	172.17	842.21
YVD-08	6/3/2018	1014.38	172.10	842.28
YVD-08	9/8/2018	1014.38	172.36	842.02
YVD-08	12/9/2018	1014.38	172.39	841.99
YVD-08	3/21/2019	1014.38	172.03	842.35
YVD-08	6/1/2019	1014.38	172.39	841.99
YVD-08	9/8/2019	1014.38	172.56	841.82
YVD-08	12/8/2019	1014.38	172.73	841.65
YVD-08	3/29/2020	1014.38	172.66	841.72

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-08	6/7/2020	1014.38	172.87	841.51
YVD-08	9/20/2020	1014.38	173.33	841.05
YVD-08	12/6/2020	1014.38	173.75	840.63
YVD-08	2/28/2021	1014.38	173.87	840.51
YVD-08	6/6/2021	1014.38	173.75	840.63
YVD-08	9/20/2021	1014.38	174.58	839.80
YVD-08	12/14/2021	1014.38	174.37	840.01
YVD-08	3/14/2022	1014.38	174.83	839.55
YVD-08	6/5/2022	1014.38	174.85	839.53
YVD-08	9/12/2022	1014.38	175.64	838.74
YVD-08	12/5/2022	1014.38	175.88	838.50
YVD-08	3/5/2023	1014.38	176.02	838.36
YVD-08	6/4/2023	1014.38	176.44	837.94
YVD-09	9/16/2013	966.81	111.14	855.67
YVD-09	12/9/2013	966.81	109.93	856.88
YVD-09	3/16/2014	966.81	109.65	857.16
YVD-09	6/1/2014	966.81	109.95	856.86
YVD-09	9/21/2014	966.81	110.08	856.73
YVD-09	12/14/2014	966.81	109.90	856.91
YVD-09	3/5/2015	966.81	109.95	856.86
YVD-09	6/15/2015	966.81	110.35	856.46
YVD-09	9/21/2015	966.81	110.83	855.98
YVD-09	12/13/2015	966.81	110.89	855.92
YVD-09	3/8/2016	966.81	111.16	855.65
YVD-09	6/19/2016	966.81	111.41	855.40
YVD-09	9/25/2016	966.81	111.68	855.13
YVD-09	12/11/2016	966.81	111.84	854.97
YVD-09	3/5/2017	966.81	111.92	854.89
YVD-09	6/4/2017	966.81	112.29	854.52
YVD-09	9/27/2017	966.81	112.50	854.31
YVD-09	12/3/2017	966.81	112.59	854.22
YVD-09	3/18/2018	966.81	112.56	854.25
YVD-09	6/3/2018	966.81	112.28	854.53
YVD-09	9/8/2018	966.81	112.19	854.62
YVD-09	12/9/2018	966.81	111.77	855.04
YVD-09	3/21/2019	966.81	111.78	855.03
YVD-09	6/1/2019	966.81	112.03	854.78
YVD-09	9/8/2019	966.81	112.37	854.44
YVD-09	12/8/2019	966.81	112.55	854.26
YVD-09	3/29/2020	966.81	112.60	854.21
YVD-09	6/7/2020	966.81	112.92	853.89
YVD-09	9/20/2020	966.81	113.29	853.52

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-09	12/6/2020	966.81	113.55	853.26
YVD-09	2/28/2021	966.81	113.63	853.18
YVD-09	6/6/2021	966.81	113.80	853.01
YVD-09	9/20/2021	966.81	114.41	852.40
YVD-09	12/14/2021	966.81	114.66	852.15
YVD-09	3/14/2022	966.81	114.54	852.27
YVD-09	6/5/2022	966.81	114.70	852.11
YVD-09	9/12/2022	966.81	115.22	851.59
YVD-09	12/5/2022	966.81	115.16	851.65
YVD-09	3/5/2023	966.81	115.21	851.60
YVD-09	6/4/2023	966.81	115.33	851.48
YVD-10	9/16/2013	958.00	90.04	867.96
YVD-10	12/9/2013	958.00	89.20	868.80
YVD-10	3/16/2014	958.00	89.39	868.61
YVD-10	6/1/2014	958.00	90.35	867.65
YVD-10	9/21/2014	958.00	90.41	867.59
YVD-10	12/14/2014	958.00	88.76	869.24
YVD-10	3/5/2015	958.00	89.90	868.10
YVD-10	6/15/2015	958.00	91.10	866.90
YVD-10	9/21/2015	958.00	91.85	866.15
YVD-10	12/13/2015	958.00	91.52	866.48
YVD-10	3/8/2016	958.00	91.91	866.09
YVD-10	6/19/2016	958.00	92.92	865.08
YVD-10	9/25/2016	958.00	92.99	865.01
YVD-10	12/11/2016	958.00	93.02	864.98
YVD-10	3/5/2017	958.00	93.24	864.76
YVD-10	6/4/2017	958.00	93.70	864.30
YVD-10	9/27/2017	958.00	93.39	864.61
YVD-10	12/3/2017	958.00	92.86	865.14
YVD-10	3/18/2018	958.00	92.49	865.51
YVD-10	6/3/2018	958.00	92.81	865.19
YVD-10	9/8/2018	958.00	93.35	864.65
YVD-10	12/9/2018	958.00	92.50	865.50
YVD-10	3/21/2019	958.00	92.36	865.64
YVD-10	6/1/2019	958.00	93.03	864.97
YVD-10	9/8/2019	958.00	93.67	864.33
YVD-10	12/8/2019	958.00	93.44	864.56
YVD-10	3/29/2020	958.00	94.06	863.94
YVD-10	6/7/2020	958.00	94.38	863.62
YVD-10	9/20/2020	958.00	94.92	863.08
YVD-10	12/6/2020	958.00	94.39	863.61
YVD-10	2/28/2021	958.00	94.67	863.33

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-10	6/6/2021	958.00	95.54	862.46
YVD-10	9/20/2021	958.00	95.88	862.12
YVD-10	12/14/2021	958.00	95.35	862.65
YVD-10	3/14/2022	958.00	95.06	862.94
YVD-10	6/5/2022	958.00	95.62	862.38
YVD-10	9/12/2022	958.00	96.37	861.63
YVD-10	12/5/2022	958.00	95.42	862.58
YVD-10	3/5/2023	958.00	95.26	862.74
YVD-10	6/4/2023	958.00	95.84	862.16
YVD-11	9/16/2013	967.91	106.03	861.88
YVD-11	12/9/2013	967.91	105.77	862.14
YVD-11	3/16/2014	967.91	105.72	862.19
YVD-11	6/1/2014	967.91	106.07	861.84
YVD-11	9/21/2014	967.91	106.04	861.87
YVD-11	12/14/2014	967.91	106.08	861.83
YVD-11	3/5/2015	967.91	106.18	861.73
YVD-11	6/15/2015	967.91	106.67	861.24
YVD-11	9/21/2015	967.91	106.52	861.39
YVD-11	12/13/2015	967.91	106.88	861.03
YVD-11	3/8/2016	967.91	107.58	860.33
YVD-11	6/19/2016	967.91	108.52	859.39
YVD-11	9/25/2016	967.91	108.95	858.96
YVD-11	12/11/2016	967.91	108.90	859.01
YVD-11	3/5/2017	967.91	109.08	858.83
YVD-11	6/4/2017	967.91	109.31	858.60
YVD-11	9/27/2017	967.91	108.75	859.16
YVD-11	12/3/2017	967.91	107.73	860.18
YVD-11	3/18/2018	967.91	108.10	859.81
YVD-11	6/3/2018	967.91	108.63	859.28
YVD-11	9/8/2018	967.91	108.97	858.94
YVD-11	12/9/2018	967.91	108.16	859.75
YVD-11	3/21/2019	967.91	108.58	859.33
YVD-11	6/1/2019	967.91	109.00	858.91
YVD-11	9/8/2019	967.91	109.58	858.33
YVD-11	12/8/2019	967.91	109.63	858.28
YVD-11	3/29/2020	967.91	110.09	857.82
YVD-11	6/7/2020	967.91	110.52	857.39
YVD-11	9/20/2020	967.91	111.12	856.79
YVD-11	12/6/2020	967.91	111.12	856.79
YVD-11	2/28/2021	967.91	111.24	856.67
YVD-11	6/6/2021	967.91	111.79	856.12
YVD-11	9/20/2021	967.91	111.94	855.97

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-11	12/14/2021	967.91	111.87	856.04
YVD-11	3/14/2022	967.91	112.00	855.91
YVD-11	6/5/2022	967.91	112.49	855.42
YVD-11	9/12/2022	967.91	111.92	855.99
YVD-11	12/5/2022	967.91	111.28	856.63
YVD-11	3/5/2023	967.91	111.52	856.39
YVD-11	6/4/2023	967.91	112.17	855.74
YVD-12	9/16/2013	961.91	138.50	823.41
YVD-12	12/9/2013	961.91	138.34	823.57
YVD-12	3/16/2014	961.91	137.55	824.36
YVD-12	6/1/2014	961.91	137.61	824.30
YVD-12	9/21/2014	961.91	137.45	824.46
YVD-12	12/14/2014	961.91	137.25	824.66
YVD-12	3/5/2015	961.91	136.52	825.39
YVD-12	6/15/2015	961.91	137.85	824.06
YVD-12	9/21/2015	961.91	138.95	822.96
YVD-12	12/13/2015	961.91	138.11	823.80
YVD-12	3/8/2016	961.91	138.26	823.65
YVD-12	6/19/2016	961.91	139.23	822.68
YVD-12	9/25/2016	961.91	139.13	822.78
YVD-12	12/11/2016	961.91	138.56	823.35
YVD-12	3/5/2017	961.91	138.02	823.89
YVD-12	6/4/2017	961.91	138.90	823.01
YVD-12	9/27/2017	961.91	139.05	822.86
YVD-12	12/3/2017	961.91	138.48	823.43
YVD-12	3/18/2018	961.91	138.46	823.45
YVD-12	6/3/2018	961.91	138.75	823.16
YVD-12	9/8/2018	961.91	139.15	822.76
YVD-12	12/9/2018	961.91	139.14	822.77
YVD-12	3/21/2019	961.91	138.69	823.22
YVD-12	6/1/2019	961.91	139.27	822.64
YVD-12	9/8/2019	961.91	139.67	822.24
YVD-12	12/8/2019	961.91	139.51	822.40
YVD-12	3/29/2020	961.91	139.82	822.09
YVD-12	6/7/2020	961.91	140.11	821.80
YVD-12	9/20/2020	961.91	140.51	821.40
YVD-12	12/6/2020	961.91	140.48	821.43
YVD-12	2/28/2021	961.91	140.39	821.52
YVD-12	6/6/2021	961.91	140.70	821.21
YVD-12	9/20/2021	961.91	141.51	820.40
YVD-12	12/14/2021	961.91	140.81	821.10
YVD-12	3/14/2022	961.91	141.28	820.63

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-12	6/5/2022	961.91	141.39	820.52
YVD-12	9/12/2022	961.91	142.17	819.74
YVD-12	12/5/2022	961.91	141.88	820.03
YVD-12	3/5/2023	961.91	141.76	820.15
YVD-12	6/4/2023	961.91	142.38	819.53
YVD-13	9/16/2013	965.59	127.43	838.16
YVD-13	12/9/2013	965.59	127.25	838.34
YVD-13	3/16/2014	965.59	127.58	838.01
YVD-13	6/1/2014	965.59	127.59	838.00
YVD-13	9/21/2014	965.59	127.29	838.30
YVD-13	12/14/2014	965.59	127.20	838.39
YVD-13	3/5/2015	965.59	127.35	838.24
YVD-13	6/15/2015	965.59	127.60	837.99
YVD-13	9/21/2015	965.59	127.36	838.23
YVD-13	12/13/2015	965.59	127.13	838.46
YVD-13	3/8/2016	965.59	127.87	837.72
YVD-13	6/19/2016	965.59	128.17	837.42
YVD-13	9/25/2016	965.59	127.88	837.71
YVD-13	12/11/2016	965.59	127.57	838.02
YVD-13	3/5/2017	965.59	127.92	837.67
YVD-13	6/4/2017	965.59	128.49	837.10
YVD-13	9/27/2017	965.59	128.05	837.54
YVD-13	12/3/2017	965.59	127.88	837.71
YVD-13	3/18/2018	965.59	128.47	837.12
YVD-13	6/3/2018	965.59	128.44	837.15
YVD-13	9/8/2018	965.59	128.28	837.31
YVD-13	12/9/2018	965.59	127.87	837.72
YVD-13	3/21/2019	965.59	128.46	837.13
YVD-13	6/1/2019	965.59	128.88	836.71
YVD-13	9/8/2019	965.59	128.62	836.97
YVD-13	12/8/2019	965.59	128.51	837.08
YVD-13	3/29/2020	965.59	129.09	836.50
YVD-13	6/7/2020	965.59	129.53	836.06
YVD-13	9/20/2020	965.59	129.32	836.27
YVD-13	12/6/2020	965.59	129.18	836.41
YVD-13	2/28/2021	965.59	129.66	835.93
YVD-13	6/6/2021	965.59	129.99	835.60
YVD-13	9/20/2021	965.59	130.05	835.54
YVD-13	12/14/2021	965.59	129.81	835.78
YVD-13	3/14/2022	965.59	130.36	835.23
YVD-13	6/5/2022	965.59	130.57	835.02
YVD-13	9/12/2022	965.59	130.70	834.89

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-13	12/5/2022	965.59	130.43	835.16
YVD-13	3/5/2023	965.59	131.16	834.43
YVD-13	6/4/2023	965.59	131.70	833.89
YVD-14	9/16/2013	920.19	77.30	842.89
YVD-14	12/9/2013	920.19	76.97	843.22
YVD-14	3/16/2014	920.19	77.45	842.74
YVD-14	6/1/2014	920.19	77.61	842.58
YVD-14	9/21/2014	920.19	77.28	842.91
YVD-14	12/14/2014	920.19	76.90	843.29
YVD-14	3/5/2015	920.19	77.51	842.68
YVD-14	6/17/2015	NM	NM	---
YVD-14	9/21/2015	NM	NM	---
YVD-14R	12/13/2015	921.41	77.76	843.65
YVD-14R	3/8/2016	921.41	78.53	842.88
YVD-14R	6/19/2016	921.41	79.03	842.38
YVD-14R	9/25/2016	921.41	78.68	842.73
YVD-14R	12/11/2016	921.41	78.57	842.84
YVD-14R	3/5/2017	921.41	79.14	842.27
YVD-14R	6/4/2017	921.41	79.53	841.88
YVD-14R	9/27/2017	921.41	78.93	842.48
YVD-14R	12/3/2017	921.41	78.72	842.69
YVD-14R	3/18/2018	921.41	79.40	842.01
YVD-14R	6/3/2018	921.41	79.35	842.06
YVD-14R	9/8/2018	921.41	79.26	842.15
YVD-14R	12/9/2018	921.41	78.93	842.48
YVD-14R	3/21/2019	921.41	79.75	841.66
YVD-14R	6/1/2019	921.41	80.14	841.27
YVD-14R	9/8/2019	921.41	79.74	841.67
YVD-14R	12/8/2019	921.41	79.60	841.81
YVD-14R	3/29/2020	921.41	80.46	840.95
YVD-14R	6/7/2020	921.41	80.83	840.58
YVD-14R	9/20/2020	921.41	80.55	840.86
YVD-14R	12/6/2020	921.41	80.38	841.03
YVD-14R	2/28/2021	921.41	80.92	840.49
YVD-14R	6/6/2021	921.41	81.41	840.00
YVD-14R	9/20/2021	921.41	81.13	840.28
YVD-14R	12/14/2021	921.41	80.95	840.46
YVD-14R	3/14/2022	921.41	81.65	839.76
YVD-14R	6/5/2022	921.41	82.01	839.40
YVD-14R	9/12/2022	921.41	81.91	839.50
YVD-14R	12/5/2022	921.41	81.58	839.83
YVD-14R	3/5/2023	921.41	82.37	839.04

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-14R	6/4/2023	921.41	82.86	838.55
YVD-15	9/16/2013	940.61	90.34	850.27
YVD-15	12/9/2013	940.61	90.49	850.12
YVD-15	3/16/2014	940.61	91.62	848.99
YVD-15	6/1/2014	940.61	92.57	848.04
YVD-15	9/21/2014	940.61	88.84	851.77
YVD-15	12/14/2014	940.61	90.56	850.05
YVD-15	3/5/2015	940.61	92.03	848.58
YVD-15	6/15/2015	940.61	93.22	847.39
YVD-15	9/21/2015	940.61	93.43	847.18
YVD-15	12/13/2015	940.61	93.21	847.40
YVD-15	3/8/2016	940.61	93.83	846.78
YVD-15	6/19/2016	940.61	94.70	845.91
YVD-15	9/25/2016	940.61	94.70	845.91
YVD-15	12/11/2016	940.61	94.44	846.17
YVD-15	3/5/2017	940.61	94.96	845.65
YVD-15	6/4/2017	940.61	95.52	845.09
YVD-15	9/27/2017	940.61	95.16	845.45
YVD-15	12/3/2017	940.61	94.74	845.87
YVD-15	3/18/2018	940.61	94.96	845.65
YVD-15	6/3/2018	940.61	95.32	845.29
YVD-15	9/8/2018	940.61	95.32	845.29
YVD-15	12/9/2018	940.61	94.79	845.82
YVD-15	3/21/2019	940.61	95.36	845.25
YVD-15	6/1/2019	940.61	95.83	844.78
YVD-15	9/8/2019	940.61	95.92	844.69
YVD-15	12/8/2019	940.61	95.55	845.06
YVD-15	3/29/2020	940.61	96.14	844.47
YVD-15	6/7/2020	940.61	96.58	844.03
YVD-15	9/20/2020	940.61	96.50	844.11
YVD-15	12/6/2020	940.61	95.96	844.65
YVD-15	2/28/2021	940.61	96.25	844.36
YVD-15	6/6/2021	940.61	96.97	843.64
YVD-15	9/20/2021	940.61	97.05	843.56
YVD-15	12/14/2021	940.61	96.53	844.08
YVD-15	3/14/2022	940.61	96.95	843.66
YVD-15	6/5/2022	940.61	97.51	843.10
YVD-15	9/12/2022	940.61	97.74	842.87
YVD-15	12/5/2022	940.61	96.95	843.66
YVD-15	3/5/2023	940.61	97.42	843.19
YVD-15	6/4/2023	940.61	98.05	842.56

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-16	9/16/2013	975.90	112.95	862.95
YVD-16	12/9/2013	975.90	112.84	863.06
YVD-16	3/16/2014	975.90	112.50	863.40
YVD-16	6/1/2014	975.90	112.62	863.28
YVD-16	9/21/2014	975.90	113.02	862.88
YVD-16	12/14/2014	975.90	112.86	863.04
YVD-16	3/5/2015	975.90	112.42	863.48
YVD-16	6/15/2015	975.90	112.85	863.05
YVD-16	9/21/2015	975.90	113.95	861.95
YVD-16	12/13/2015	975.90	114.04	861.86
YVD-16	3/8/2016	975.90	114.51	861.39
YVD-16	6/19/2016	975.90	115.18	860.72
YVD-16	9/25/2016	975.90	115.67	860.23
YVD-16	12/11/2016	975.90	115.17	860.73
YVD-16	3/5/2017	975.90	114.90	861.00
YVD-16	6/4/2017	975.90	115.51	860.39
YVD-16	9/27/2017	975.90	115.32	860.58
YVD-16	12/3/2017	975.90	114.86	861.04
YVD-16	3/18/2018	975.90	114.49	861.41
YVD-16	6/3/2018	975.90	114.62	861.28
YVD-16	9/8/2018	975.90	115.77	860.13
YVD-16	12/9/2018	975.90	115.57	860.33
YVD-16	3/21/2019	975.90	115.14	860.76
YVD-16	6/1/2019	975.90	115.72	860.18
YVD-16	9/8/2019	975.90	116.43	859.47
YVD-16	12/8/2019	975.90	116.71	859.19
YVD-16	3/29/2020	975.90	116.83	859.07
YVD-16	6/7/2020	975.90	117.34	858.56
YVD-16	9/20/2020	975.90	118.44	857.46
YVD-16	12/6/2020	975.90	118.68	857.22
YVD-16	2/28/2021	975.90	118.70	857.20
YVD-16	6/6/2021	975.90	118.88	857.02
YVD-16	9/20/2021	975.90	119.54	856.36
YVD-16	12/14/2021	975.90	119.34	856.56
YVD-16	3/14/2022	975.90	119.54	856.36
YVD-16	6/5/2022	975.90	119.79	856.11
YVD-16	9/12/2022	975.90	120.60	855.30
YVD-16	12/5/2022	975.90	120.48	855.42
YVD-16	3/5/2023	975.90	119.91	855.99
YVD-16	6/4/2023	975.90	120.48	855.42
YVD-17	9/16/2013	866.73	32.07	834.66
YVD-17	12/9/2013	866.73	34.81	831.92

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-17	3/16/2014	866.73	37.97	828.76
YVD-17	6/1/2014	866.73	35.50	831.23
YVD-17	9/21/2014	866.73	31.86	834.87
YVD-17	12/14/2014	866.73	34.74	831.99
YVD-17	3/5/2015	866.73	37.79	828.94
YVD-17	6/15/2015	866.73	34.57	832.16
YVD-17	9/21/2015	866.73	31.92	834.81
YVD-17	12/13/2015	866.73	35.16	831.57
YVD-17	3/8/2016	866.73	37.47	829.26
YVD-17	6/19/2016	866.73	35.37	831.36
YVD-17	9/25/2016	866.73	32.31	834.42
YVD-17	12/11/2016	866.73	35.20	831.53
YVD-17	3/5/2017	866.73	37.88	828.85
YVD-17	6/4/2017	866.73	36.13	830.60
YVD-17	9/27/2017	866.73	31.22	835.51
YVD-17	12/3/2017	866.73	34.65	832.08
YVD-17	3/18/2018	866.73	38.54	828.19
YVD-17	6/3/2018	866.73	36.20	830.53
YVD-17	9/8/2018	866.73	32.64	834.09
YVD-17	12/9/2018	866.73	35.42	831.31
YVD-17	3/21/2019	866.73	39.08	827.65
YVD-17	6/1/2019	866.73	37.30	829.43
YVD-17	9/9/2019	866.73	32.69	834.04
YVD-17	12/8/2019	866.73	35.95	830.78
YVD-17	3/29/2020	866.73	39.61	827.12
YVD-17	6/7/2020	866.73	36.93	829.80
YVD-17	9/20/2020	866.73	33.68	833.05
YVD-17	12/6/2020	866.73	36.31	830.42
YVD-17	2/28/2021	866.73	39.80	826.93
YVD-17	6/6/2021	866.73	37.82	828.91
YVD-17	9/20/2021	866.73	34.26	832.47
YVD-17	12/14/2021	866.73	37.37	829.36
YVD-17	3/14/2022	866.73	40.62	826.11
YVD-17	6/5/2022	866.73	38.57	828.16
YVD-17	9/12/2022	866.73	34.72	832.01
YVD-17	12/5/2022	866.73	37.42	829.31
YVD-17	3/5/2023	866.73	41.06	825.67
YVD-17	6/4/2023	866.73	39.70	827.03
YVD-18	9/16/2013	965.74	127.49	838.25
YVD-18	12/9/2013	965.74	127.45	838.29
YVD-18	3/16/2014	965.74	127.75	837.99
YVD-18	6/1/2014	965.74	127.69	838.05

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-18	9/21/2014	965.74	127.33	838.41
YVD-18	12/14/2014	965.74	127.33	838.41
YVD-18	3/5/2015	965.74	127.46	838.28
YVD-18	6/15/2015	965.74	127.71	838.03
YVD-18	9/21/2015	965.74	127.42	838.32
YVD-18	12/13/2015	965.74	127.24	838.50
YVD-18	3/8/2016	965.74	128.05	837.69
YVD-18	6/19/2016	965.74	128.29	837.45
YVD-18	9/25/2016	965.74	127.92	837.82
YVD-18	12/11/2016	965.74	127.66	838.08
YVD-18	3/5/2017	965.74	128.01	837.73
YVD-18	6/4/2017	965.74	128.54	837.20
YVD-18	9/27/2017	965.74	128.14	837.60
YVD-18	12/3/2017	965.74	127.95	837.79
YVD-18	3/18/2018	965.74	128.72	837.02
YVD-18	6/3/2018	965.74	128.48	837.26
YVD-18	9/8/2018	965.74	128.35	837.39
YVD-18	12/9/2018	965.74	128.00	837.74
YVD-18	3/21/2019	965.74	128.62	837.12
YVD-18	6/1/2019	965.74	129.04	836.70
YVD-18	9/8/2019	965.74	128.71	837.03
YVD-18	12/8/2019	965.74	128.63	837.11
YVD-18	3/29/2020	965.74	129.29	836.45
YVD-18	6/7/2020	965.74	129.67	836.07
YVD-18	9/20/2020	965.74	129.41	836.33
YVD-18	12/6/2020	965.74	129.32	836.42
YVD-18	2/28/2021	965.74	129.90	835.84
YVD-18	6/6/2021	965.74	130.11	835.63
YVD-18	9/20/2021	965.74	130.20	835.54
YVD-18	12/14/2021	965.74	129.97	835.77
YVD-18	3/14/2022	965.74	130.62	835.12
YVD-18	6/5/2022	965.74	130.74	835.00
YVD-18	9/12/2022	965.74	130.84	834.90
YVD-18	12/5/2022	965.74	130.56	835.18
YVD-18	3/5/2023	965.74	131.40	834.34
YVD-18	6/4/2023	965.74	131.89	833.85

Notes:

---: not available or not applicable

BTOC: below top of casing

NAVD88: North American Vertical Datum of 1988

Table 5
Estimated Possible Average Linear Groundwater Flow Velocities – Second Quarter 2023

Material	Hydraulic Conductivity[1,2] [K] (feet per day)	Effective Porosity[3] [n_e]	K/n_e	Estimated Possible Average Linear Groundwater Flow Velocities [V_X] (feet per day)			
				Second Quarter 2023 Hydraulic Gradients			
				Site Average I[4]	Upslope I	Central I	Southern I
				0.013	*0.026*	*0.011*	*0.004*
Fine sand	53	0.33	161	2.0	4.2	1.7	0.7
Medium sand to fine gravel	131	0.32	409	5.2	10.6	4.4	1.8
Medium sand to coarse gravel	164	0.30	547	6.9	14.2	5.8	2.4
Fine gravel	267	0.28	954	12.0	24.7	10.2	4.2

Notes:

1. Hydraulic conductivities obtained from U.S. Environmental Protection Agency Method 9100, Saturated Hydraulic Conductivity, Saturated Leachate Conductivity, and Intrinsic Permeability, Chapter 6 – Properties; Publication SW-846: *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* ; 1986.
2. Hydraulic conductivities presented are for well-sorted (poorly graded) material.
3. Effective porosity obtained from *Data Collection Handbook to Support Modeling Impacts of Radioactive Material in Soil* ; Environmental Assessment and Information Sciences Division, Argonne National Laboratory; Argonne, Illinois; April 1993.
4. Hydraulic gradient [I] in feet per foot.

Table 6
Field Parameter Measurements – Second Quarter 2023

Well ID	Measurement Date	Bladder Pump Type (portable or dedicated)	Purge Time (minutes)	Volume Purged (liters)	Temperature (°C)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH (Standard Units)	Oxidation/Reduction Potential (mV)	Turbidity (NTU)
DC-01	6/19/2023	Dedicated	253	16.2	17.2	7.54	747	7.66	130.9	3.48
DC-03	6/20/2023	Dedicated	18	6.8	14.5	5.41	2446	6.82	161.2	0.80
DC-03D	6/20/2023	Dedicated	15	2.0	15.4	1.13	1429	6.84	169.1	0.29
DC-04	6/20/2023	Dedicated	18	6.6	14.3	8.62	1399	7.22	157.7	0.35
DC-05	6/20/2023	Dedicated	18	5.0	14.7	7.84	1218	7.22	203.4	1.63
DC-05D	6/20/2023	Dedicated	15	5.0	14.8	11.8	671	7.62	169.8	0.17
DC-07	6/21/2023	Dedicated	18	5.0	14.9	0.29	1227	6.66	177.2	0.45
DC-09	6/21/2023	Dedicated	15	1.6	16.3	7.74	423.1	7.52	132.9	4.94
DC-14	6/20/2023	Dedicated	30	2.0	17.6	2.37	1831	6.56	151.4	9.14
YVD-03	6/19/2023	Dedicated	15	0.9	14.7	8.19	532.2	8.19	145.6	9.58
YVD-04	6/19/2023	Dedicated	15	0.9	14.8	8.33	484.9	7.65	142.8	2.94
YVD-05	6/20/2023	Dedicated	20	1.1	18.3	7.01	591	7.78	135.0	3.39
YVD-06	6/20/2023	Dedicated	15	2.1	15.7	7.08	287.0	7.80	132.0	3.33
YVD-07	6/20/2023	Dedicated	24	1.8	19.4	8.12	425.1	8.04	136.4	3.43
YVD-08	6/21/2023	Dedicated	27	1.8	19.7	5.53	1519	7.21	139.8	11.2
YVD-09	6/21/2023	Dedicated	15	1.5	16.9	5.13	1517	7.17	132.5	5.94
YVD-10	6/21/2023	Dedicated	15	2.8	13.4	6.19	2490	6.78	145.7	5.26
YVD-11	6/21/2023	Dedicated	15	1.7	14.8	6.40	1863	6.85	226.5	1.14
YVD-12	6/21/2023	Dedicated	24	4.4	17.1	6.26	1134	7.47	139.8	0.84
YVD-13	6/20/2023	Dedicated	15	1.6	16.2	6.79	1219	7.62	154.5	2.19
YVD-14R	6/21/2023	Dedicated	18	4.8	15.3	1.01	2454	6.64	163.8	0.20
YVD-15	6/21/2023	Dedicated	18	5.2	14.5	7.14	986	7.11	171.0	0.61
YVD-16	6/20/2023	Dedicated	33	2.8	16.3	8.68	961	7.43	125.5	5.00
YVD-17	6/20/2023	Dedicated	21	7.4	14.3	4.47	313.1	7.95	143.1	0.18
YVD-18	6/20/2023	Dedicated	15	1.5	15.4	8.62	1056	7.78	146.1	2.65

Notes:

---: no value or not applicable

°C: degrees Celsius

µS/cm: microsiemens per centimeter

mg/L: milligrams per liter

mV: millivolt

NTU: nephelometric turbidity unit

Table 7
Groundwater Analytical Results – Second Quarter 2023

				Analyte	Nitrate (as N)		
				Analytical Method	EPA 300.0		
Well ID	Sample ID	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code
DC-01	YVD-061923-02	6/19/2023	N	K2307010	**7.79**	J	HTQ
DC-03	YVD-062023-20	6/20/2023	N	K2307093	**130**	J	HTQ
DC-03D	YVD-062023-17	6/20/2023	N	K2307093	**36.0**	J	HTQ
DC-03D	YVD-062023-18	6/20/2023	FD	K2307093	**36.2**	J	HTQ
DC-04	YVD-062023-11	6/20/2023	N	K2307010	**27.6**	J	HTQ
DC-05	YVD-062023-08	6/20/2023	N	K2307010	**33.9**	J	HTQ
DC-05D	YVD-062023-10	6/20/2023	N	K2307010	**11.2**	J	HTQ
DC-07	YVD-062123-27	6/21/2023	N	K2307093	**2.50**	J	HTQ
DC-09	YVD-062123-22	6/21/2023	N	K2307093	**6.23**	J	HTQ
DC-09	YVD-062123-23	6/21/2023	FD	K2307093	**5.92**	J	HTQ
DC-14	YVD-062023-12	6/20/2023	N	K2307010	**50.5**	J	HTQ
YVD-02	NS[1]	--	--	--	**--**	--	--
YVD-03	YVD-061923-04	6/19/2023	N	K2307010	**4.97**	J	HTQ
YVD-04	YVD-061923-03	6/19/2023	N	K2307010	**3.93**	J	HTQ
YVD-05	YVD-062023-09	6/20/2023	N	K2307010	**6.18**	J	HTQ
YVD-06	YVD-062023-06	6/20/2023	N	K2307010	**0.76**	J	HTQ
YVD-06	YVD-062023-07	6/20/2023	FD	K2307010	**0.75**	**J**	HTQ
YVD-07	YVD-062023-19	6/20/2023	N	K2307093	**4.15**	J	HTQ
YVD-08	YVD-062123-28	6/21/2023	N	K2307093	**54.3**	J	HTQ
YVD-09	YVD-062123-30	6/21/2023	N	K2307093	**63.6**	J	HTQ
YVD-10	YVD-062123-26	6/21/2023	N	K2307093	**66.1**	J	HTQ
YVD-11	YVD-062123-24	6/21/2023	N	K2307093	**80.8**	J	HTQ
YVD-12	YVD-062123-31	6/21/2023	N	K2307093	**20.5**	J	HTQ
YVD-13	YVD-062023-14	6/20/2023	N	K2307093	**35.0**	J	HTQ
YVD-14R	YVD-062123-29	6/21/2023	N	K2307093	**117**	J	HTQ
YVD-15	YVD-062123-25	6/21/2023	N	K2307093	**12.4**	J	HTQ
YVD-16	YVD-062023-13	6/20/2023	N	K2307010	**24.8**	J	HTQ
YVD-17	YVD-062023-15	6/20/2023	N	K2307093	**0.62**	J	HTQ
YVD-18	YVD-062023-16	6/20/2023	N	K2307093	**32.1**	J	HTQ

Table 7
Groundwater Analytical Results – Second Quarter 2023

Notes:
1. Well YVD-02 was dry. No sample could be collected
Bold: detected result
--: not applicable
(as N): reported as nitrogen
EPA: U.S. Environmental Protection Agency
FD: field duplicate
HTQ: Analysis was conducted outside of the designated holding time.
J: The compound was positively identified; however, the associated numerical value is an estimated concentration.
mg/L: milligrams per liter
N: normal sample
NS: not sampled

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-01	DC-01-130104	01/04/2013	N	EPA01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**9.80**	--	--
DC-01	DC-01-130924	09/24/2013	N	SWI0178	**110**	--	--	**110**	--	--	--	--	--	0.100	U	--	**88.9**	--	--	**44.0**	--	--	0.500	U	--	**32.5**	--	--	--	--	--	**11.1**	--	--
DC-01	DC-01-131211	12/11/2013	N	SWL0063	**159**	--	--	**160**	--	--	--	--	--	--	R	MSD	**91.4**	--	--	**47.8**	--	--	5.00	U	--	**32.6**	--	--	--	--	--	**11.5**	--	--
DC-01	DC-01-140318	03/18/2014	N	SXC0095	**159**	--	--	**160**	--	--	--	--	--	**0.101**	--	--	**90.5**	--	--	**48.2**	--	--	5.00	U	--	**31.4**	--	--	--	--	--	**11.2**	--	--
DC-01	DC-01-140602	06/02/2014	N	SXF0017	**164**	--	--	**165**	--	--	--	--	--	0.100	U	--	**88.6**	--	--	**41.4**	--	--	2.00	U	--	**31.9**	--	--	--	--	--	**9.76**	--	--
DC-01	DC-01-140923	09/23/2014	N	SXI0158	**154**	--	--	**155**	--	--	--	--	--	--	R	MSD	**89.4**	--	--	**41.8**	--	--	5.00	U	--	**31.2**	--	--	--	--	--	**9.00**	--	--
DC-01	DC-01-141216	12/16/2014	N	SXL0121	**140**	--	--	**140**	--	--	--	--	--	0.100	U	--	**92.8**	--	--	**85.7**	--	--	5.00	U	--	**34.0**	--	--	--	--	--	**18.9**	--	--
DC-01	DC-01-150316	03/16/2015	N	5904471	**150**	--	--	**150**	--	--	--	--	--	0.100	U	--	**91.0**	--	--	**44.0**	--	--	5.00	U	--	**32.0**	--	--	--	--	--	**11.0**	--	--
DC-01	DC-01-150616	06/16/2015	N	59010751	**150**	--	--	**150**	--	--	--	--	--	0.100	U	--	**91.0**	J+	MSD	**42.0**	--	--	5.00	U	--	**33.0**	J+	MSD	--	--	--	**9.50**	--	--
DC-01	DC-01-150923	09/23/2015	N	59020281	**150**	--	--	**150**	--	--	--	--	--	**0.130**	--	--	**83.0**	--	--	**37.0**	--	--	5.00	U	--	**32.0**	--	--	--	--	--	**8.60**	--	--
DC-01	YVD-D1-150923	09/23/2015	FD	59020281	**160**	--	--	**160**	--	--	--	--	--	0.100	U	--	**85.0**	--	--	**43.0**	--	--	0.500	U	--	**33.0**	--	--	--	--	--	**10.0**	--	--
DC-01	DC-01-151214	12/14/2015	N	59025431	**170**	J	FDP	**170**	J	FDP	--	--	--	--	R	MSD	**97.0**	--	--	**38.0**	--	--	5.00	U	--	**34.0**	--	--	--	--	--	**8.80**	--	--
DC-01	DC-01-160308	03/08/2016	N	59029711	**150**	--	--	**150**	--	--	--	--	--	--	R	FBK, FDP	**83.0**	--	--	**40.0**	--	--	5.00	U	--	**30.0**	--	--	--	--	--	**8.60**	--	--
DC-01	DC-01-160620	6/20/2016	N	59037101	**150**	--	--	**150**	--	--	--	--	--	0.100	U	--	**83.0**	--	--	**40.0**	--	--	5.00	U	--	**31.0**	--	--	--	--	--	**9.20**	--	--
DC-01	DC-01-160928	9/28/2016	N	K1611629	**147**	--	--	**147**	--	--	--	--	--	0.050	U	MBK	**80.6**	--	--	**34.0**	--	--	**0.250**	--	--	**28.5**	--	--	--	--	--	**9.15**	--	--
DC-01	DC-01-161212	12/12/2016	N	K1615045	**144**	--	--	**144**	--	--	--	--	--	0.050	U	--	**81.1**	--	--	**31.9**	--	--	**0.390**	--	--	**27.9**	--	--	--	--	--	**8.89**	J	HTQ
DC-01	YVD-030817-18	3/8/2017	N	K1702324	**148**	--	--	**148**	--	--	--	--	--	1.00	U	--	**80.8**	--	--	**32.6**	--	--	**0.390**	--	--	**27.0**	--	--	--	--	--	**9.00**	--	--
DC-01	YVD-060417-03	6/4/2017	N	K1705702	**147**	--	--	**147**	--	--	--	--	--	0.050	U	--	**83.4**	--	--	**32.9**	--	--	**0.400**	--	--	**26.2**	--	--	--	--	--	**8.20**	--	--
DC-01	YVD-060417-05	6/4/2017	FD	K1705702	**147**	--	--	**147**	--	--	--	--	--	0.050	U	--	**83.0**	--	--	**33.2**	--	--	**0.380**	--	--	**25.7**	--	--	--	--	--	**8.20**	--	--
DC-01	YVD-092517-13	9/25/2017	N	K1710333	**148**	--	--	**148**	--	--	--	--	--	0.050	U	--	**78.9**	--	--	**33.2**	--	--	**0.370**	--	--	**26.1**	--	--	--	--	--	**8.41**	--	--
DC-01	YVD-120617-31	12/6/2017	N	K1713157	**146**	--	--	**146**	--	--	--	--	--	0.050	U	--	**83.7**	--	--	**33.2**	--	--	**0.370**	--	--	**28.1**	--	--	--	--	--	**8.81**	--	--
DC-01	YVD-060418-19	6/4/2018	N	874662	**141**	--	--	**141**	--	--	0.070	U	FBK	--	--	--	**80.5**	--	--	**34.6**	--	--	**0.360**	--	--	**28.8**	--	--	--	--	--	**8.60**	--	--
DC-01	YVD-060219-03	6/2/2019	N	991939	**142**	--	--	**142**	--	--	0.070	U	--	--	--	--	**76.5**	--	--	46.3	U	FBK	0.990	U	FBK	**26.2**	--	--	--	--	--	**8.60**	--	--
DC-01	YVD-060820-07	6/8/2020	N	009144	**143**	--	--	**143**	--	--	0.070	U	--	--	--	--	**76.0**	--	--	**33.1**	--	--	**0.300**	--	--	**26.3**	--	--	--	--	--	**7.60**	--	--
DC-01	YVD-060721-10	6/7/2021	N	124105	**140**	--	--	**140**	--	--	0.070	U	--	--	--	--	**72.5**	--	--	**32.4**	--	--	**0.320**	--	--	**25.2**	--	--	--	--	--	**8.00**	--	--
DC-01	YVD-060622-15	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**7.80**	--	--
DC-01	YVD-061923-02	6/19/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**7.79**	J	HTQ
DC-03	DC-03-130102	01/02/2013	N	EPA01	--	--	--	--	--	--	--	--	--	0.100	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**190**	--	--
DC-03	DC-03-130918	09/18/2013	N	SWI0138	**435**	--	--	**435**	--	--	--	--	--	0.100	U	--	**284**	--	--	**176**	--	--	5.00	U	--	**73.7**	--	--	--	--	--	**166**	--	--
DC-03	DC-03-131212	12/12/2013	N	SWL0078	**474**	--	--	**475**	--	--	--	--	--	0.020	U	--	**280**	--	--	**172**	--	--	5.00	U	--	**75.0**	--	--	--	--	--	**174**	--	--
DC-03	YVD-D3-131212	12/12/2013	FD	SWL0078	**459**	--	--	**460**	--	--	--	--	--	0.020	U	--	**292**	--	--	**142**	--	--	5.00	U	--	**77.3**	--	--	--	--	--	**182**	--	--
DC-03	DC-03-140319	03/19/2014	N	SXC0107	**459**	--	--	**460**	--	--	--	--	--	0.100	U	--	**261**	--	--	**159**	J	FDP	5.00	U	--	**66.8**	--	--	--	--	--	**195**	--	--
DC-03	YVD-D3-140319	03/19/2014	FD	SXC0107	**469**	--	--	**470**	--	--	--	--	--	0.100	U	--	**261**	--	--	**128**	J	FDP	5.00	U	--	**66.7**	--	--	--	--	--	**164**	--	--
DC-03	DC-03-140604	06/04/2014	N	SXF0025	**425**	--	--	**425**	--	--	--	--	--	0.100	U	--	**259**	--	--	**201**	--	--	10.0	U	--	**67.7**	--	--	--	--	--	**234**	--	--
DC-03	DC-03-140924	09/24/2014	N	SXI0173	**409**	--	--	**410**	--	--	--	--	--	0.100	U	--	**291**	--	--	**147**	--	--	5.00	U	--	**77.1**	--	--	--	--	--	**170**	--	--
DC-03	DC-03-141217	12/17/2014	N	SXL0144	**429**	--	--	**430**	--	--	--	--	--	**0.180**	J+	FBK, MBK	**274**	--	--	**157**	--	--	10.0	U	--	**74.9**	--	--	--	--	--	**193**	--	--
DC-03	YVD-D4-141217	12/17/2014	FD	SXL0144	**423**	--	--	**425**	--	--	--	--	--	0.100	U	--	**271**	--	--	**182**	--	--	5.00	U	--	**72.6**	--	--	--	--	--	**156**	--	--
DC-03	DC-03-150318	03/18/2015	N	5904651	**420**	--	--	**420**	--	--	--	--	--	0.100	U	--	**260**	--	--	**160**	--	--	5.00	U	--	**73.0**	--	--	--	--	--	**180**	--	--
DC-03	YVD-D4-150318	03/18/2015	FD	5904651	**410**	--	--	**410**	--	--	--	--	--	**0.120**	--	--	**270**	--	--	**150**	--	--	2.50	U	--	**74.0**	--	--	--	--	--	**180**	--	--
DC-03	DC-03-150617	06/17/2015	N	59011021	**460**	--	--	**460**	--	--	--	--	--	0.100	U	--	**290**	--	--	**170**	--	--	5.00	U	--	**78.0**	J	RPD	--	--	--	**180**	J--	MSD, FBD, FDP
DC-03	YVD-D4-150617	06/17/2015	FD	59011021	**450**	--	--	**450**	--	--	--	--	--	0.100	U	--	**290**	--	--	**180**	--	--	5.00	U	--	**77.0**	J	RPD	--	--	--	**10**	J--	MSD, FBD, FDP
DC-03	DC-03-150925	09/25/2015	N	59020431	**390**	--	--	**390**	--	--	--	--	--	**0.100**	--	--	**270**	--	--	**140**	--	--	10.0	U	--	**73.0**	--	--	--	--	--	**180**	--	--
DC-03	YVD-D4-150925	09/25/2015	FD	59020431	**460**	--	--	**460**	--	--	--	--	--	**0.200**	--	--	**260**	--	--	**140**	--	--	0.50	U	--	**69.0**	--	--	--	--	--	**180**	--	--
DC-03	DC-03-151216	12/16/2015	N	59025501	**400**	--	--	**400**	--	--	--	--	--	**0.180**	J--	MSD	**260**	--	--	**170**	--	--	5.00	U	--	**75.0**	--	--	--	--	--	**200**	--	--
DC-03	YVD-D4-151216	12/16/2015	FD	59025501	**380**	--	--	**380**	--	--	--	--	--	--	R	MSD	**250**	--	--	**160**	--	--	2.50	U	--	**75.0**	--	--	--	--	--	**170**	--	--
DC-03	DC-03-160310	03/10/2016	N	59029941	**460**	--	--	**460**	--	--	--	--	--	0.100	U	--	**270**	--	--	**150**	--	--	5.00	U	--	**72.0**	--	--	--	--	--	**180**	--	--
DC-03	YVD-D4-160310	03/10/2016	FD	59029941	**480**	--	--	**480**	--	--	--	--	--	0.100	U	--	**270**	--	--	**160**	--	--	5.00	U	--	**72.0**	--	--	--	--	--	**190**	--	--
DC-03	DC-03-160623	6/23/2016	N	59037371	**420**	--	--	**420**	--	--	--	--	--	**0.120**	J--	MSD	**270**	--	--	**150**	--	--	5.00	U	--	**73.0**	--	--	--	--	--	**180**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-03	YVD-D4-160623	6/23/2016	FD	59037371	**410**	--	--	**410**	--	--	--	--	--	**0.110**	J--	MSD	**250**	--	--	**160**	--	--	2.50	U	--	**71.0**	--	--	--	--	--	**170**	--	--
DC-03	DC-03-160927	9/27/2016	N	K1611565	**425**	--	--	**425**	--	--	--	--	--	0.050	U	MBK	**265**	--	--	**136**	--	--	**0.200**	J	--	**72.4**	--	--	--	--	--	**163**	--	--
DC-03	DC-03-D2-160927	9/27/2016	FD	K1611565	**427**	--	--	**427**	--	--	--	--	--	0.050	U	MBK	**262**	--	--	**137**	--	--	**0.190**	J	--	**71.9**	--	--	--	--	--	**163**	--	--
DC-03	DC-03-161212	12/12/2016	N	K1615029	**371**	--	--	**371**	--	--	--	--	--	0.050	U	--	**254**	--	--	**131**	--	--	**0.240**	--	--	**65.7**	--	--	--	--	--	**168**	J	HTQ
DC-03	YVD-030817-13	3/8/2017	N	K1702324	**381**	--	--	**381**	--	--	--	--	--	1.00	U	--	**267**	--	--	**150**	--	--	**0.220**	--	--	**66.0**	--	--	--	--	--	**179**	--	--
DC-03	YVD-060517-02	6/5/2017	N	K1705702	**358**	--	--	**358**	--	--	--	--	--	0.050	U	--	**271**	--	--	**152**	--	--	**0.240**	--	--	**61.6**	--	--	--	--	--	**181**	--	--
DC-03	YVD-060517-04	6/5/2017	FD	K1705702	**360**	--	--	**360**	--	--	--	--	--	0.050	U	--	**269**	--	--	**152**	--	--	**0.280**	--	--	**70.6**	--	--	--	--	--	**182**	--	--
DC-03	YVD-092617-22	9/26/2017	N	K1710333	**329**	--	--	**329**	--	--	--	--	--	0.050	U	--	**279**	--	--	**154**	--	--	**0.240**	--	--	**68.9**	--	--	--	--	--	**192**	--	--
DC-03	YVD-120417-10	12/4/2017	N	K1713026	**333**	--	--	**333**	--	--	--	--	--	0.050	U	--	**274**	--	--	**161**	--	--	**0.240**	--	--	**69.4**	--	--	--	--	--	**207**	--	--
DC-03	YVD-031818-04	3/18/2018	N	870610	**374**	--	--	**374**	--	--	0.070	U	--	--	--	--	**280**	--	--	**156**	--	--	**0.190**	--	--	**67.0**	--	--	--	--	--	**192**	--	--
DC-03	YVD-060418-22	6/4/2018	N	874860	**358**	--	--	**358**	--	--	**1.22**	--	--	--	--	--	**266**	--	--	**152**	--	--	**0.190**	--	--	**67.0**	--	--	--	--	--	**184**	--	--
DC-03	YVD-090918-17	9/9/2018	N	880601	**460**	--	--	**460**	--	--	0.070	U	--	--	--	--	**267**	--	--	**133**	--	--	**0.200**	--	--	**65.5**	--	--	--	--	--	**157**	--	--
DC-03	YVD-121018-03	12/10/2018	N	884857	**415**	--	--	**415**	--	--	0.070	U	--	--	--	--	**263**	--	--	**142**	--	--	0.200	U	FBK	**65.5**	J	MSD	--	--	--	**180**	--	--
DC-03	YVD-031819-19	3/18/2019	N	988273	**435**	--	--	**435**	--	--	0.070	U	--	--	--	--	**276**	--	--	**150**	--	--	**0.190**	--	--	**66.0**	--	--	--	--	--	**186**	--	--
DC-03	YVD-060419-32	6/4/2019	N	992242	**406**	--	--	**406**	--	--	**0.270**	--	--	--	--	--	**282**	--	--	**155**	--	--	**0.270**	--	--	**70.0**	--	--	--	--	--	**178**	--	--
DC-03	YVD-091019-23	9/10/2019	N	998438	**463**	--	--	**463**	--	--	0.070	U	--	--	--	--	**285**	--	--	**132**	--	--	**0.150**	--	--	**74.0**	--	--	--	--	--	**180**	--	--
DC-03	YVD-121019-22	12/10/2019	N	902321	**433**	--	--	**433**	--	--	0.070	U	--	--	--	--	**261**	--	--	**121**	--	--	**0.170**	--	--	**65.5**	--	--	--	--	--	**175**	--	--
DC-03	YVD-033120-22	3/31/2020	N	006260	**418**	--	--	**418**	--	--	0.070	U	--	--	--	--	**284**	--	--	**136**	--	--	**0.170**	--	--	**71.0**	--	--	--	--	--	**166**	--	--
DC-03	YVD-060920-26	6/9/2020	N	009269	**426**	--	--	**426**	--	--	0.070	U	--				**298**	--	--	**163**	--	--	**0.140**	--	--	**75.0**	--	--	--	--	--	**205**	--	--
DC-03	YVD-092120-21	9/21/2020	N	013896	**429**	--	--	**429**	--	--	0.070	U	--	--	--	--	**284**	--	--	**140**	--	--	**0.240**	--	--	**73.5**	--	--	--	--	--	**177**	--	--
DC-03	YVD-120720-05	12/7/2020	N	017035	**430**	--	--	**430**	--	--	0.070	U	--	--	--	--	**260**	--	--	**122**	--	--	**0.150**	--	--	**64.5**	--	--	--	--	--	**144**	--	--
DC-03	YVD-120720-07	12/7/2020	FD	017035	**431**	--	--	**431**	--	--	0.070	U	--	--	--	--	**256**	--	--	**122**	--	--	**0.150**	--	--	**64.5**	--	--	--	--	--	**153**	--	--
DC-03	YVD-030221-23	3/2/2021	N	120034	**393**	--	--	**393**	--	--	0.070	U	--	--	--	--	**286**	--	--	**141**	--	--	**0.170**	--	--	**69.0**	--	--	--	--	--	**186**	--	--
DC-03	YVD-060821-27	6/8/2021	N	124212	**406**	--	--	**406**	--	--	0.070	U	--	--	--	--	**280**	--	--	**150**	--	--	0.100	U	--	**69.5**	--	--	--	--	--	**185**	--	--
DC-03	YVD-031522-10	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**182**	--	--
DC-03	YVD-031522-11	3/15/2022	FD	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**183**	--	--
DC-03	YVD-060522-10	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**157**	--	--
DC-03	YVD-091322-12	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**155**	--	--
DC-03	YVD-122722-21	12/27/2022	N	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**138**	--	--
DC-03	YVD-030623-15	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**140**	--	--	--	--	--
DC-03	YVD-062023-20	6/20/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**130**	J	HTQ
DC-03D	DC-03D-130918	09/18/2013	N	SWI0138	**509**	--	--	**510**	--	--	--	--	--	0.100	U	--	**198**	--	--	**56.0**	--	--	5.00	U	--	**44.0**	--	--	--	--	--	**46.4**	--	--
DC-03D	DC-03D-131212	12/12/2013	N	SWL0073	**559**	--	--	**560**	--	--	--	--	--	0.020	UJ	MSD	**194**	--	--	**67.9**	--	--	5.00	U	--	**43.3**	--	--	--	--	--	**38.9**	--	--
DC-03D	DC-03D-140319	03/19/2014	N	SXC0107	**564**	--	--	**565**	--	--	--	--	--	**0.127**	--	--	**200**	--	--	**65.9**	--	--	5.00	U	--	**43.9**	--	--	--	--	--	**42.5**	--	--
DC-03D	DC-03D-140603	06/03/2014	N	SXF0017	**542**	--	--	**543**	--	--	--	--	--	0.100	U	--	**179**	--	--	**65.5**	--	--	2.00	U	--	**40.9**	--	--	--	--	--	**42.0**	--	--
DC-03D	DC-03D-140923	09/23/2014	N	SXI0173	**514**	--	--	**515**	--	--	--	--	--	0.100	U	--	**216**	--	--	**59.5**	--	--	2.50	U	--	**46.6**	--	--	--	--	--	**38.0**	--	--
DC-03D	DC-03D-141217	12/17/2014	N	SXL0121	**514**	--	--	**515**	--	--	--	--	--	0.100	U	--	**203**	--	--	**62.8**	--	--	2.50	U	--	**46.8**	--	--	--	--	--	**38.6**	--	--
DC-03D	DC-03D-150317	03/17/2015	N	5904651	**530**	--	--	**530**	--	--	--	--	--	0.100	U	--	**210**	--	--	**63.0**	--	--	2.50	U	--	**48.0**	--	--	--	--	--	**37.0**	--	--
DC-03D	DC-03D-150617	06/17/2015	N	59011021	**530**	--	--	**530**	--	--	--	--	--	0.100	U	--	**210**	--	--	**71.0**	--	--	2.50	U	--	**48.0**	J	RPD	--	--	--	**42.0**	J--	MSD
DC-03D	DC-03D-150925	09/25/2015	N	59020431	**610**	--	--	**610**	--	--	--	--	--	0.100	U	--	**200**	--	--	**58.0**	--	--	10.0	U	--	**47.0**	--	--	--	--	--	**33.0**	--	--
DC-03D	DC-03D-151216	12/16/2015	N	59025501	**590**	--	--	**590**	--	--	--	--	--	--	R	MSD	**210**	--	--	**70.0**	--	--	2.50	U	--	**50.0**	--	--	--	--	--	**36.0**	--	--
DC-03D	DC-03D-160310	03/10/2016	N	59029941	**580**	--	--	**580**	--	--	--	--	--	0.100	U	--	**200**	--	--	**65.0**	--	--	2.50	U	--	**47.0**	--	--	--	--	--	**37.0**	--	--
DC-03D	DC-03D-160623	6/23/2016	N	59037371	**530**	--	--	**530**	--	--	--	--	--	**0.110**	J--	MSD	**200**	--	--	**65.0**	--	--	5.00	U	--	**47.0**	--	--	--	--	--	**36.0**	--	--
DC-03D	DC-03D-160927	9/27/2016	N	K1611565	**546**	--	--	**546**	--	--	--	--	--	0.050	U	MBK	**188**	--	--	**58.7**	--	--	**0.100**	J	--	**47.1**	--	--	--	--	--	**32.8**	--	--
DC-03D	DC-03D-161212	12/12/2016	N	K1615029	**544**	--	--	**544**	--	--	--	--	--	0.050	U	--	**200**	--	--	**57.8**	--	--	**0.120**	J	--	**44.8**	--	--	--	--	--	**33.8**	J	HTQ
DC-03D	YVD-030817-14	3/8/2017	N	K1702324	**537**	--	--	**537**	--	--	--	--	--	1.00	U	--	**196**	--	--	**59.5**	--	--	**0.160**	J	--	**43.4**	--	--	--	--	--	**32.9**	--	--
DC-03D	YVD-030817-16	3/8/2017	FD	K1702324	**555**	--	--	**555**	--	--	--	--	--	1.00	U	--	**194**	--	--	**59.1**	--	--	**0.170**	J	--	**42.7**	--	--	--	--	--	**32.8**	--	--
DC-03D	YVD-060517-09	6/5/2017	N	K1705702	**533**	--	--	**533**	--	--	--	--	--	0.050	U	--	**203**	--	--	**58.7**	--	--	**0.130**	J	--	**41.3**	--	--	--	--	--	**31.9**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-03D	YVD-092617-24	9/26/2017	N	K1710333	**537**	--	--	**537**	--	--	--	--	--	0.050	U	--	**194**	--	--	**60.1**	--	--	**0.120**	J	--	**44.2**	--	--	--	--	--	**33.2**	--	--
DC-03D	YVD-120417-08	12/4/2017	N	K1713026	**525**	--	--	**525**	--	--	--	--	--	0.050	U	--	**195**	--	--	**57.9**	--	--	**0.170**	J	--	**41.5**	--	--	--	--	--	**33.6**	--	--
DC-03D	YVD-031818-02	3/18/2018	N	870610	**529**	--	--	**529**	--	--	0.070	U	--	--	--	--	**199**	--	--	**66.1**	--	--	0.100	U	--	**42.7**	--	--	--	--	--	**32.6**	--	--
DC-03D	YVD-060418-24	6/4/2018	N	874860	**533**	--	--	**533**	--	--	0.070	U	--	--	--	--	**187**	--	--	**64.7**	--	--	**0.100**	--	--	**42.9**	--	--	--	--	--	**31.0**	--	--
DC-03D	YVD-090918-15	9/9/2018	N	880601	**541**	--	--	**541**	--	--	0.070	U	--	--	--	--	**200**	--	--	**69.5**	--	--	**0.100**	--	--	**42.9**	--	--	--	--	--	**32.9**	--	--
DC-03D	YVD-121018-05	12/10/2018	N	884857	**543**	--	--	**543**	--	--	0.070	U	--	--	--	--	**191**	--	--	**62.1**	--	--	0.100	U	FBK	**42.5**	J	MSD	--	--	--	**34.8**	--	--
DC-03D	YVD-031819-17	3/18/2019	N	988273	**536**	--	--	**536**	--	--	0.070	U	--	--	--	--	**192**	--	--	**61.4**	--	--	**0.130**	--	--	**41.6**	--	--	--	--	--	**35.4**	--	--
DC-03D	YVD-060419-30	6/4/2019	N	992242	**499**	--	--	**499**	--	--	0.070	U	--	--	--	--	**186**	--	--	**59.6**	--	--	0.100	U	--	**40.4**	--	--	--	--	--	**36.6**	--	--
DC-03D	YVD-060419-31	6/4/2019	FD	992242	**494**	--	--	**494**	--	--	0.070	U	--	--	--	--	**182**	--	--	**60.6**	--	--	0.100	U	--	**40.7**	--	--	--	--	--	**37.2**	--	--
DC-03D	YVD-091019-21	9/10/2019	N	998438	**506**	--	--	**506**	--	--	0.070	U	--	--	--	--	**186**	--	--	**58.4**	--	--	0.100	U	--	**41.0**	--	--	--	--	--	**36.4**	--	--
DC-03D	YVD-091019-22	9/10/2019	FD	998438	**514**	--	--	**514**	--	--	0.070	U	--	--	--	--	**186**	--	--	**58.3**	--	--	0.100	U	--	**41.2**	--	--	--	--	--	**36.5**	--	--
DC-03D	YVD-121019-20	12/10/2019	N	902321	**502**	--	--	**502**	--	--	0.070	U	--	--	--	--	**182**	--	--	**65.0**	--	--	0.100	U	--	**39.9**	--	--	--	--	--	**36.2**	--	--
DC-03D	YVD-033120-20	3/31/2020	N	006260	**456**	--	--	**456**	--	--	0.070	U	--	--	--	--	**175**	--	--	**58.5**	--	--	0.100	U	--	**38.4**	--	--	--	--	--	**39.0**	--	--
DC-03D	YVD-061020-34	6/10/2020	N	009361	**458**	--	--	**458**	--	--	0.070	U	--	--	--	--	**168**	--	--	**60.8**	--	--	0.100	U	--	**36.2**	J	MS	--	--	--	**37.0**	--	--
DC-03D	YVD-092120-19	9/21/2020	N	013896	**460**	--	--	**460**	--	--	0.070	U	--	--	--	--	**176**	--	--	**68.9**	--	--	0.100	U	--	**38.3**	--	--	--	--	--	**38.5**	--	--
DC-03D	YVD-120720-09	12/7/2020	N	017035	**452**	--	--	**452**	--	--	0.070	U	--	--	--	--	**174**	--	--	**66.3**	--	--	**0.150**	--	--	**38.6**	--	--	--	--	--	**35.8**	--	--
DC-03D	YVD-030221-21	3/2/2021	N	120034	**481**	--	--	**481**	--	--	0.070	U	--	--	--	--	**181**	--	--	**69.6**	--	--	0.100	U	--	**39.2**	--	--	--	--	--	**39.8**	--	--
DC-03D	YVD-030221-21	3/2/2021	N	120034	**481**	--	--	**481**	--	--	0.070	U	--	--	--	--	**181**	--	--	**69.6**	--	--	0.100	U	--	**39.2**	--	--	--	--	--	**39.8**	--	--
DC-03D	YVD-060821-29	6/8/2021	N	124212	**456**	--	--	**456**	--	--	0.070	U	--	--	--	--	**175**	--	--	**66.8**	--	--	0.100	U	--	**39.0**	--	--	--	--	--	**41.4**	--	--
DC-03D	YVD-060821-31	6/8/2021	FD	124212	**455**	--	--	**455**	--	--	0.070	U	--	--	--	--	**174**	--	--	**66.7**	--	--	0.100	U	--	**38.4**	--	--	--	--	--	**39.9**	--	--
DC-03D	YVD-121421-10	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**35.1**	--	--
DC-03D	YVD-031422-08	3/14/2022	N	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**41.6**	--	--
DC-03D	YVD-060522-11	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**39.1**	--	--
DC-03D	YVD-060522-11	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**39.1**	--	--
DC-03D	YVD-091322-10	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**37.7**	--	--
DC-03D	YVD-122722-20	12/27/2022	N	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**36.8**	--	--
DC-03D	YVD-030623-14	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**40.7**	--	--	--	--	--
DC-03D	YVD-062023-17	6/20/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**36.0**	J	HTQ
DC-03D	YVD-062023-18	6/20/2023	FD	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**36.2**	J	HTQ
DC-04	DC-04-130103	01/03/2013	N	EPA01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**26.0**	--	--
DC-04	DC-04-130920	09/20/2013	N	SWI0142	**305**	--	--	**305**	--	--	--	--	--	0.100	U	--	**141**	--	--	**39.4**	--	--	5.00	U	--	**25.5**	--	--	--	--	--	--	--	--
DC-04	DC-04-130924	09/24/2013	N	SWI0175	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**31.7**	--	--
DC-04	DC-04-131212	12/12/2013	N	SWL0073	**315**	--	--	**315**	--	--	--	--	--	0.020	UJ	MSD	**148**	--	--	**41.1**	--	--	5.00	U	--	**28.4**	--	--	--	--	--	**36.7**	--	--
DC-04	DC-04-140318	03/18/2014	N	SXC0107	**325**	--	--	**325**	--	--	--	--	--	0.100	U	--	**153**	--	--	**42.0**	--	--	5.00	U	--	**28.0**	--	--	--	--	--	**37.3**	--	--
DC-04	DC-04-140603	06/03/2014	N	SXF0017	**310**	--	--	**310**	--	--	--	--	--	0.100	U	--	**134**	--	--	**36.2**	--	--	2.00	U	--	**28.9**	--	--	--	--	--	**36.4**	--	--
DC-04	DC-04-140923	09/23/2014	N	SXI0173	**317**	--	--	**320**	--	--	--	--	--	0.100	U	--	**174**	--	--	**39.7**	--	--	2.50	U	--	**34.2**	--	--	--	--	--	**37.8**	--	--
DC-04	DC-04-141217	12/17/2014	N	SXL0121	**329**	--	--	**330**	--	--	--	--	--	0.100	U	--	**182**	--	--	**42.7**	--	--	2.50	U	--	**35.7**	--	--	--	--	--	**40.8**	--	--
DC-04	DC-04-150317	03/17/2015	N	5904651	**340**	--	--	**340**	--	--	--	--	--	0.100	U	--	**180**	--	--	**41.0**	--	--	2.50	U	--	**34.0**	--	--	--	--	--	**39.0**	--	--
DC-04	DC-04-150617	06/17/2015	N	59010961	**330**	--	--	**330**	--	--	--	--	--	0.100	U	--	**180**	--	--	**46.0**	--	--	5.00	U	--	**34.0**	--	--	--	--	--	**42.0**	--	--
DC-04	DC-04-150924	09/24/2015	N	59020391	**400**	--	--	**400**	--	--	--	--	--	0.100	UJ	MSD	**160**	--	--	**48.0**	--	--	2.50	U	--	**36.0**	--	--	--	--	--	**48.0**	J+	MSD
DC-04	YVD-D3-150924	09/24/2015	FD	59020391	**380**	--	--	**380**	--	--	--	--	--	0.100	UJ	MSD	**170**	--	--	**53.0**	--	--	2.50	U	--	**37.0**	--	--	--	--	--	**53.0**	J+	MSD
DC-04	DC-04-151215	12/15/2015	N	59025431	**400**	J	FDP	**400**	J	FDP	--	--	--	--	R	MSD	**180**	--	--	**46.0**	--	--	2.50	U	--	**36.0**	--	--	--	--	--	**48.0**	--	--
DC-04	DC-04-160309	03/09/2016	N	59029711	**390**	--	--	**390**	--	--	--	--	--	0.100	UJ	FDP	**190**	--	--	**53.0**	--	--	2.50	U	--	**36.0**	--	--	--	--	--	**53.0**	--	--
DC-04	DC-04-160621	6/21/2016	N	59037271	**360**	--	--	**360**	--	--	--	--	--	0.100	UJ	MSD	**200**	--	--	**50.0**	--	--	2.50	U	--	**40.0**	--	--	--	--	--	**50.0**	--	--
DC-04	DC-04-160926	9/26/2016	N	K1611506	**374**	--	--	**374**	--	--	--	--	--	0.050	U	MBK	**194**	--	--	**43.4**	--	--	**0.120**	J	--	**40.6**	--	--	--	--	--	**44.1**	--	--
DC-04	DC-04-161216	12/12/2016	N	K1615174	**384**	--	--	**384**	--	--	--	--	--	0.050	U	--	**214**	--	--	**44.7**	--	--	**0.150**	J	--	**39.7**	--	--	--	--	--	**45.2**	--	--
DC-04	YVD-031017-31	3/10/2017	N	K1702448	**375**	--	--	**375**	--	--	--	--	--	0.050	U	--	**219**	--	--	**43.1**	--	--	**0.160**	J	--	**36.3**	--	--	--	--	--	**46.0**	--	--
DC-04	YVD-031017-33	3/10/2017	FD	K1702448	**383**	--	--	**383**	--	--	--	--	--	0.050	U	--	**219**	--	--	**43.2**	--	--	**0.160**	J	--	**36.3**	--	--	--	--	--	**45.7**	--	--
DC-04	YVD-060617-26	6/6/2017	N	K1705833	**390**	--	--	**390**	--	--	--	--	--	0.050	U	--	**202**	--	--	**38.6**	--	--	**0.130**	J	--	**37.0**	--	--	--	--	--	**38.4**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-04	YVD-092517-06	9/25/2017	N	K1710274	**391**	--	--	**391**	--	--	--	--	--	0.050	U	--	**192**	--	--	**35.2**	--	--	**0.140**	J	--	**37.0**	--	--	--	--	--	**33.7**	--	--
DC-04	YVD-120517-24	12/5/2017	N	K1713091	**388**	--	--	**388**	--	--	--	--	--	0.050	U	--	**188**	--	--	**34.3**	--	--	**0.120**	J	--	**32.7**	--	--	--	--	--	**33.8**	J	HTQ
DC-04	YVD-031818-07	3/18/2018	N	870610	**377**	--	--	**377**	--	--	0.070	U	--	--	--	--	**182**	--	--	**34.5**	--	--	0.100	U	--	**32.1**	--	--	--	--	--	**32.9**	--	--
DC-04	YVD-060418-18	6/4/2018	N	874662	**380**	--	--	**380**	--	--	0.070	U	FBK	--	--	--	**182**	--	--	**35.4**	--	--	**0.100**	--	--	**33.6**	--	--	--	--	--	**33.0**	--	--
DC-04	YVD-090918-18	9/9/2018	N	880601	**371**	--	--	**371**	--	--	0.070	U	--	--	--	--	**176**	--	--	**32.4**	--	--	**0.120**	--	--	**30.4**	--	--	--	--	--	**30.4**	--	--
DC-04	YVD-121118-18	12/11/2018	N	884939	**376**	--	--	**376**	--	--	0.070	U	--	--	--	--	**166**	--	--	**30.4**	--	--	**0.110**	--	--	**29.4**	--	--	--	--	--	**29.4**	--	--
DC-04	YVD-032019-21	3/20/2019	N	988477	**393**	--	--	**393**	--	--	0.070	U	--	--	--	--	**172**	--	--	**26.2**	--	--	**0.100**	--	--	**30.5**	--	--	--	--	--	**29.6**	--	--
DC-04	YVD-060219-14	6/2/2019	N	991939	**390**	--	--	**390**	--	--	**0.090**	--	--	--	--	--	**173**	--	--	22.9	U	FBK	0.100	U	--	**30.6**	--	--	--	--	--	**29.1**	--	--
DC-04	YVD-090919-09	9/9/2019	N	998357	**387**	--	--	**387**	--	--	0.070	U	--	--	--	--	**169**	--	--	**33.1**	--	--	0.100	U	--	**30.4**	--	--	--	--	--	**31.4**	--	--
DC-04	YVD-120919-07	12/9/2019	N	902276	**382**	--	--	**382**	--	--	0.070	U	--	--	--	--	**167**	--	--	**33.4**	--	--	0.100	U	--	**30.4**	--	--	--	--	--	**31.3**	--	--
DC-04	YVD-033120-18	3/31/2020	N	006260	**390**	--	--	**390**	--	--	0.070	U	--	--	--	--	**171**	--	--	**34.1**	--	--	**0.100**	--	--	**30.5**	--	--	--	--	--	**29.8**	--	--
DC-04	YVD-060820-08	6/8/2020	N	009144	**395**	--	--	**395**	--	--	0.070	U	--	--	--	--	**173**	--	--	**34.5**	--	--	**0.100**	--	--	**31.0**	--	--	--	--	--	**30.9**	--	--
DC-04	YVD-092020-07	9/20/2020	N	013864	**403**	--	--	**403**	--	--	0.070	U	--	--	--	--	**184**	--	--	**39.4**	--	--	0.100	U	--	**33.4**	--	--	--	--	--	**34.1**	--	--
DC-04	YVD-120820-23	12/8/2020	N	017137	**422**	--	--	**422**	--	--	0.070	U	--	--	--	--	**193**	--	--	**41.3**	--	--	0.100	U	--	**34.7**	--	--	--	--	--	**34.4**	--	--
DC-04	YVD-030221-20	3/2/2021	N	120034	**443**	--	--	**443**	--	--	0.070	U	--	--	--	--	**208**	--	--	**46.2**	--	--	**0.150**	--	--	**36.2**	--	--	--	--	--	**35.0**	--	--
DC-04	YVD-030221-22	3/2/2021	FD	120034	**440**	--	--	**440**	--	--	0.070	U	--	--	--	--	**200**	--	--	**45.7**	--	--	**0.150**	--	--	**35.7**	--	--	--	--	--	**34.3**	--	--
DC-04	YVD-030221-20	3/2/2021	N	120034	**443**	--	--	**443**	--	--	0.070	U	--	--	--	--	**208**	--	--	**46.2**	--	--	**0.150**	--	--	**36.2**	--	--	--	--	--	**35.0**	--	--
DC-04	YVD-030221-22	3/2/2021	FD	120034	**440**	--	--	**440**	--	--	0.070	U	--	--	--	--	**200**	--	--	**45.7**	--	--	**0.150**	--	--	**35.7**	--	--	--	--	--	**34.3**	--	--
DC-04	YVD-060621-06	6/6/2021	N	124053	**438**	--	--	**438**	--	--	0.070	U	--	--	--	--	**195**	--	--	**39.6**	--	--	0.100	U	--	**34.8**	--	--	--	--	--	**30.9**	--	--
DC-04	YVD-121521-21	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**32.7**	J	HTQ, MS
DC-04	YVD-031522-15	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**35.3**	--	--
DC-04	YVD-060522-05	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**34.5**	--	--
DC-04	YVD-091322-06	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**33.0**	--	--
DC-04	YVD-120722-09	12/7/2022	N	K2214479	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**30.2**	--	--
DC-04	YVD-120722-10	12/7/2022	FD	K2214479	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**30.4**	--	--
DC-04	YVD-030623-17	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**29.9**	--	--	--	--	--
DC-04	YVD-030623-18	3/6/2023	FD	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**29.7**	--	--	--	--	--
DC-04	YVD-062023-11	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**27.6**	J	HTQ
DC-05	DC-05-130104	01/04/2013	N	EPA01	--		--	--		--	--	--	--	--		--	--		--	--		--	--		--	--		--	--		--	**32.0**		--
DC-05	DC-05-130920	09/20/2013	N	SWI0142	**414**		--	**415**		--	--	--	--	**0.255**		--	**129**		--	**36.7**		--	5.00	U	--	**48.5**		--	--	--	--	--		--
DC-05	DC-05-130924	09/24/2013	N	SWI0175	--		--	--		--	--	--	--	--		--	--		--	--		--	--		--	--		--	--	--	--	**33.6**		--
DC-05	DC-05-131212	12/12/2013	N	SWL0073	**424**	--	--	**425**	--	--	--	--	--	0.020	UJ	MSD	**130**	--	--	**35.9**	--	--	5.00	U	--	**50.2**	--	--	--	--	--	**42.6**	--	--
DC-05	DC-05-140318	03/18/2014	N	SXC0107	**404**	--	--	**405**	--	--	--	--	--	**0.131**	--	--	**133**	--	--	**33.0**	--	--	5.00	U	--	**49.7**	--	--	--	--	--	**33.1**	--	--
DC-05	DC-05-140603	06/03/2014	N	SXF0017	**412**	--	--	**413**	--	--	--	--	--	0.100	U	--	**118**	--	--	**31.6**	--	--	2.00	U	--	**46.7**	--	--	--	--	--	**32.6**	--	--
DC-05	DC-05-140923	09/23/2014	N	SXI0173	**408**	--	--	**410**	--	--	--	--	--	0.100	U	--	**140**	--	--	**35.0**	--	--	2.50	U	--	**53.5**	--	--	--	--	--	**35.8**	--	--
DC-05	DC-05-141217	12/17/2014	N	SXL0121	**414**	--	--	**415**	--	--	--	--	--	0.100	U	--	**147**	--	--	**34.4**	--	--	2.50	U	--	**58.9**	--	--	--	--	--	**33.4**	--	--
DC-05	DC-05-150317	03/17/2015	N	5904541	**430**	--	--	**430**	--	--	--	--	--	0.100	U	--	**150**	--	--	**36.0**	--	--	**2.00**	--	--	**58.0**	--	--	--	--	--	**38.0**	J--	MSD
DC-05	DC-05-150616	06/16/2015	N	59010961	**410**	--	--	**410**	--	--	--	--	--	0.100	U	--	**140**	--	--	**35.0**	--	--	2.00	U	--	**57.0**	--	--	--	--	--	**37.0**	--	--
DC-05	YVD-D2-150616	06/16/2015	FD	59010961	**410**	--	--	**410**	--	--	--	--	--	0.100	U	--	**140**	--	--	**35.0**	--	--	5.00	U	--	**56.0**	--	--	--	--	--	**41.0**	--	--
DC-05	DC-05-150923	09/23/2015	N	59020391	**440**	--	--	**440**	--	--	--	--	--	0.100	UJ	MSD	**130**	--	--	**33.0**	--	--	2.00	U	--	**57.0**	--	--	--	--	--	**38.0**	J+	MSD
DC-05	DC-05-151215	12/15/2015	N	59025431	**440**	J	FDP	**440**	J	FDP	--	--	--	--	R	MSD	**140**	--	--	**29.0**	--	--	2.00	U	--	**55.0**	--	--	--	--	--	**38.0**	--	--
DC-05	DC-05-160309	03/09/2016	N	59029711	**410**	--	--	**410**	--	--	--	--	--	0.100	UJ	FDP	**140**	--	--	**35.0**	--	--	2.00	U	--	**54.0**	--	--	--	--	--	**43.0**	--	--
DC-05	DC-05-160621	6/21/2016	N	59037151	**390**	--	--	**390**	--	--	--	--	--	0.100	UJ	--	**130**	--	--	**34.0**	--	--	2.00	U	--	**54.0**	--	--	--	--	--	**36.0**	--	--
DC-05	DC-05-160926	9/26/2016	N	K1611506	**346**	--	--	**346**	--	--	--	--	--	0.050	U	--	**119**	--	--	**26.5**	--	--	**0.150**	J	--	**49.7**	--	--	--	--	--	**32.1**	--	--
DC-05	DC-05-D1-160926	9/26/2016	FD	K1611506	**364**	--	--	**364**	--	--	--	--	--	0.050	U	MBK	**124**	--	--	**26.6**	--	--	**0.160**	J	--	**52.5**	--	--	--	--	--	**32.2**	--	--
DC-05	DC-05-161216	12/16/2016	N	K1615174	**348**	--	--	**348**	--	--	--	--	--	0.050	U	--	**129**	--	--	**28.6**	--	--	**0.190**	J	--	**45.4**	--	--	--	--	--	**33.7**	--	--
DC-05	YVD-D5-161216	12/16/2016	FD	K1615174	**340**	--	--	**340**	--	--	--	--	--	0.050	U	--	**128**	--	--	**28.9**	--	--	**0.190**	J	--	**48.0**	--	--	--	--	--	**33.3**	--	--
DC-05	YVD-030717-09	3/7/2017	N	K1702324	**367**	--	--	**367**	--	--	--	--	--	1.00	U	--	**117**	--	--	**28.5**	--	--	**0.200**	J	--	**43.5**	--	--	--	--	--	**32.9**	J	HTQ
DC-05	YVD-060717-30	6/7/2017	N	K1705833	**364**	--	--	**364**	--	--	--	--	--	0.050	U	--	**122**	--	--	**26.8**	--	--	**0.160**	J	--	**47.1**	--	--	--	--	--	**30.8**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-05	YVD-060717-32	6/7/2017	FD	K1705833	**364**	--	--	**364**	--	--	--	--	--	0.050	U	--	**122**	--	--	**26.3**	--	--	**0.160**	J	--	**45.8**	--	--	--	--	--	**30.7**	--	--
DC-05	YVD-092517-04	9/25/2017	N	K1710274	**368**	--	--	**368**	--	--	--	--	--	0.050	U	--	**126**	--	--	**28.1**	--	--	**0.190**	J	--	**49.7**	--	--	--	--	--	**30.7**	--	--
DC-05	YVD-120517-16	12/5/2017	N	K1713091	**364**	--	--	**364**	--	--	--	--	--	0.050	U	--	**119**	--	--	**31.9**	--	--	**0.180**	J	--	**42.5**	--	--	--	--	--	**34.5**	J	HTQ
DC-05	YVD-120517-18	12/5/2017	FD	K1713091	**366**	--	--	**366**	--	--	--	--	--	0.050	U	--	**120**	--	--	**31.3**	--	--	**0.190**	J	--	**43.1**	--	--	--	--	--	**33.9**	J	HTQ
DC-05	YVD-031818-03	3/18/2018	N	870610	**364**	--	--	**364**	--	--	**0.100**	--	--	--	--	--	**116**	--	--	**33.0**	--	--	0.140	U	--	**42.4**	--	--	--	--	--	**33.6**	--	--
DC-05	YVD-031818-05	3/18/2018	FD	870610	**356**	--	--	**356**	--	--	0.070	U	--	--	--	--	**116**	--	--	**33.1**	--	--	**0.140**	--	--	**42.9**	--	--	--	--	--	**33.8**	--	--
DC-05	YVD-060318-02	6/3/2018	FD	874568	**368**	--	--	**368**	--	--	0.070	U	--	--	--	--	**118**	--	--	**32.2**	--	--	**0.150**	--	--	**43.5**	--	--	--	--	--	**34.4**	--	--
DC-05	YVD-090918-03	9/9/2018	N	880601	**378**	--	--	**378**	--	--	0.070	U	--	--	--	--	**122**	--	--	**31.4**	--	--	**0.180**	--	--	**42.6**	--	--	--	--	--	**31.5**	--	--
DC-05	YVD-121118-16	12/11/2018	N	884939	**390**	--	--	**390**	--	--	0.070	U	--	--	--	--	**120**	--	--	**33.7**	--	--	**0.160**	--	--	**43.4**	--	--	--	--	--	**33.2**	--	--
DC-05	YVD-031719-02	3/17/2019	N	988239	**396**	--	--	**396**	--	--	0.070	U	--	--	--	--	**126**	--	--	**29.9**	--	--	0.120	U	FBK	**44.3**	--	--	--	--	--	**30.4**	--	--
DC-05	YVD-060219-08	6/2/2019	N	991939	**400**	--	--	**400**	--	--	0.070	U	--	--	--	--	**122**	--	--	26.2	U	FBK	0.120	U	FBK	**44.2**	--	--	--	--	--	**28.8**	--	--
DC-05	YVD-090919-14	9/9/2019	N	998357	**389**	--	--	**389**	--	--	0.070	U	--	--	--	--	**120**	--	--	**25.4**	--	--	**0.140**	--	--	**42.3**	--	--	--	--	--	**26.7**	--	--
DC-05	YVD-120919-03	12/9/2019	N	902276	**400**	--	--	**400**	--	--	0.070	U	--	--	--	--	**120**	--	--	**28.1**	--	--	**0.140**	--	--	**43.0**	--	--	--	--	--	**29.3**	--	--
DC-05	YVD-033020-12	3/30/2020	N	006241	**402**	--	--	**402**	--	--	0.070	U	--	--	--	--	**120**	--	--	**26.0**	--	--	**0.140**	--	--	**43.5**	--	--	--	--	--	**25.6**	--	--
DC-05	YVD-060820-06	6/8/2020	N	009144	**404**	--	--	**404**	--	--	0.070	U	--	--	--	--	**116**	--	--	**24.4**	--	--	**0.160**	--	--	**41.8**	--	--	--	--	--	**24.0**	--	--
DC-05	YVD-092020-03	9/20/2020	N	013864	**387**	--	--	**387**	--	--	0.070	U	--	--	--	--	**126**	--	--	**26.8**	--	--	**0.120**	--	--	**45.1**	--	--	--	--	--	**27.8**	--	--
DC-05	YVD-120720-06	12/7/2020	N	017035	**372**	--	--	**372**	--	--	0.070	U	--	--	--	--	**130**	--	--	**24.0**	--	--	**0.120**	--	--	**47.6**	--	--	--	--	--	**29.6**	--	--
DC-05	YVD-030221-16	3/2/2021	N	120034	**388**	--	--	**388**	--	--	0.070	U	--	--	--	--	**139**	--	--	**30.5**	--	--	**0.120**	--	--	**49.3**	--	--	--	--	--	**32.3**	--	--
DC-05	YVD-060721-14	6/7/2021	N	124105	**360**	--	--	**360**	--	--	0.070	U	--	--	--	--	**129**	--	--	**34.9**	--	--	**0.170**	--	--	**46.5**	--	--	--	--	--	**38.5**	--	--
DC-05	YVD-121521-15	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**43.5**	J	HTQ, MS
DC-05	YVD-031422-04	3/14/2022	N	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**35.9**	--	--
DC-05	YVD-060522-02	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**41.7**	--	--
DC-05	YVD-060522-03	6/5/2022	FD	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**40.6**	--	--
DC-05	YVD-091322-02	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**18.6**	--	--
DC-05	YVD-091322-04	9/13/2022	FD	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**19.0**	--	--
DC-05	YVD-120622-02	12/6/2022	N	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**10.0**	--	--
DC-05	YVD-120622-03	12/6/2022	FD	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**10.0**	--	--
DC-05	YVD-030623-20	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**12.5**	--	--	--	--	--
DC-05	YVD-062023-08	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**33.9**	J	HTQ
DC-05D	DC-05D-130920	09/20/2013	N	SWI0142	**214**	--	--	**215**	--	--	--	--	--	0.100	U	--	**86.7**	--	--	**43.6**	--	--	5.00	U	--	**30.3**	--	--	--	--	--	--	--	--
DC-05D	DC-05D-130924	09/24/2013	N	SWI0178	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**14.6**	--	--
DC-05D	DC-05D-131211	12/11/2013	N	SWL0073	**209**	--	--	**210**	--	--	--	--	--	0.020	UJ	MSD	**81.8**	--	--	**32.3**	--	--	5.00	U	--	**28.8**	--	--	--	--	--	**16.0**	--	--
DC-05D	DC-05D-140318	03/18/2014	N	SXC0095	**209**	--	--	**210**	--	--	--	--	--	**0.182**	--	--	**86.2**	--	--	**33.4**	--	--	5.00	U	--	**29.4**	--	--	--	--	--	**12.8**	--	--
DC-05D	DC-05D-140602	06/02/2014	N	SXF0017	**214**	--	--	**215**	--	--	--	--	--	**0.163**	--	--	**67.4**	--	--	**30.6**	--	--	2.00	U	--	**24.6**	--	--	--	--	--	**3.36**	--	--
DC-05D	DC-05D-140922	09/22/2014	N	SXI0148	**203**	--	--	**205**	--	--	--	--	--	0.100	U	--	**83.3**	--	--	**30.9**	--	--	2.00	U	--	**30.2**	--	--	--	--	--	**11.7**	--	--
DC-05D	DC-05D-141216	12/16/2014	N	SXL0121	**199**	--	--	**200**	--	--	--	--	--	0.100	U	--	**78.9**	--	--	**35.9**	--	--	5.00	U	--	**29.5**	--	--	--	--	--	**7.90**	--	--
DC-05D	DC-05D-150317	03/17/2015	N	5904541	**210**	--	--	**210**	--	--	--	--	--	0.100	U	--	**78.0**	--	--	**31.0**	--	--	2.00	U	--	**29.0**	--	--	--	--	--	**7.70**	J--	MSD
DC-05D	DC-05D-150616	06/16/2015	N	59010961	**210**	--	--	**210**	--	--	--	--	--	0.100	U	--	**79.0**	--	--	**34.0**	--	--	2.00	U	--	**30.0**	--	--	--	--	--	**8.60**	--	--
DC-05D	DC-05D-150923	09/23/2015	N	59020391	**200**	--	--	**200**	--	--	--	--	--	0.100	UJ	MSD	**74.0**	--	--	**31.0**	--	--	2.00	U	--	**31.0**	--	--	--	--	--	**8.90**	J+	MSD
DC-05D	YVD-D2-150923	09/23/2015	FD	59020391	**220**	--	--	**220**	--	--	--	--	--	**0.160**	J	MSD	**73.0**	--	--	**33.0**	--	--	0.500	U	--	**30.0**	--	--	--	--	--	**10.0**	J+	MSD
DC-05D	DC-05D-151215	12/15/2015	N	59025431	**230**	J	FDP	**230**	J	FDP	--	--	--	--	R	MSD	**78.0**	--	--	**30.0**	--	--	2.00	U	--	**29.0**	--	--	--	--	--	**9.90**	--	--
DC-05D	DC-05D-160309	03/09/2016	N	59029711	**220**	--	--	**220**	--	--	--	--	--	0.100	UJ	FDP	**81.0**	--	--	**33.0**	--	--	2.00	U	--	**30.0**	--	--	--	--	--	**13.0**	--	--
DC-05D	DC-05D-160621	6/21/2016	N	59037271	**210**	--	--	**210**	--	--	--	--	--	**0.130**	J--	MSD	**78.0**	--	--	**32.0**	--	--	2.00	U	--	**30.0**	--	--	--	--	--	**12.0**	--	--
DC-05D	DC-05D-160926	9/26/2016	N	K1611506	**209**	--	--	**209**	--	--	--	--	--	0.050	U	--	**81.4**	--	--	**25.6**	--	--	**0.260**	--	--	**28.4**	--	--	--	--	--	**11.2**	--	--
DC-05D	DC-05D-161214	12/14/2016	N	K1615126	**202**	--	--	**202**	--	--	--	--	--	0.050	U	--	**78.1**	--	--	**25.7**	--	--	**0.280**	--	--	**27.5**	--	--	--	--	--	**11.2**	--	--
DC-05D	YVD-030717-12	3/7/2017	N	K1702324	**206**	--	--	**206**	--	--	--	--	--	1.00	U	--	**76.4**	--	--	**26.3**	--	--	**0.320**	--	--	**26.5**	--	--	--	--	--	**11.6**	J	HTQ
DC-05D	YVD-060717-34	6/7/2017	N	K1705833	**201**	--	--	**201**	--	--	--	--	--	0.050	U	--	**79.1**	--	--	**23.9**	--	--	**0.290**	--	--	**27.3**	--	--	--	--	--	**10.8**	--	--
DC-05D	YVD-092517-02	9/25/2017	N	K1710274	**207**	--	--	**207**	--	--	--	--	--	0.050	U	--	**79.2**	--	--	**25.2**	--	--	**0.280**	--	--	**28.9**	--	--	--	--	--	**11.1**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-05D	YVD-092517-03	9/25/2017	FD	K1710274	**207**	--	--	**207**	--	--	--	--	--	0.050	U	--	**80.6**	--	--	**24.9**	--	--	**0.270**	--	--	**29.1**	--	--	--	--	--	**11.0**	--	--
DC-05D	YVD-120517-20	12/5/2017	N	K1713091	**202**	--	--	**202**	--	--	--	--	--	0.050	U	--	**81.2**	--	--	**26.6**	--	--	**0.280**	--	--	**27.1**	--	--	--	--	--	**11.9**	J	HTQ
DC-05D	YVD-031818-08	3/18/2018	N	870610	**198**	--	--	**198**	--	--	0.070	U	--	--	--	--	**82.0**	--	--	**27.4**	--	--	**0.250**	--	--	**27.5**	--	--	--	--	--	**12.6**	--	--
DC-05D	YVD-060318-03	6/3/2018	N	874568	**203**	--	--	**203**	--	--	0.080	U	FBK	--	--	--	**78.5**	--	--	**27.4**	--	--	**0.350**	--	--	**28.0**	--	--	--	--	--	**12.5**	--	--
DC-05D	YVD-060318-05	6/3/2018	FD	874568	**202**	--	--	**202**	--	--	0.070	U	--	--	--	--	**78.5**	--	--	**27.4**	--	--	**0.260**	--	--	**28.0**	--	--	--	--	--	**13.4**	--	--
DC-05D	YVD-090918-02	9/9/2018	N	880601	**204**	--	--	**204**	--	--	0.070	U	--	--	--	--	**79.5**	--	--	**26.8**	--	--	**0.250**	--	--	**26.8**	--	--	--	--	--	**12.2**	--	--
DC-05D	YVD-121118-14	12/11/2018	N	884939	**204**	--	--	**204**	--	--	0.070	U	--	--	--	--	**78.5**	--	--	**25.7**	--	--	**0.240**	--	--	**26.5**	--	--	--	--	--	**12.4**	--	--
DC-05D	YVD-031719-04	3/17/2019	N	988239	**204**	--	--	**204**	--	--	0.070	U	--	--	--	--	**79.0**	--	--	**26.6**	--	--	0.220	U	FBK	**26.9**	--	--	--	--	--	**12.8**	--	--
DC-05D	YVD-031719-06	3/17/2019	FD	988239	**206**	--	--	**206**	--	--	0.070	U	--	--	--	--	**81.5**	--	--	**26.4**	--	--	0.220	U	FBK	**27.1**	--	--	--	--	--	**12.6**	--	--
DC-05D	YVD-060219-10	6/2/2019	N	991939	**206**	--	--	**206**	--	--	0.070	U	--	--	--	--	**78.0**	--	--	26.0	U	FBK	0.250	U	FBK	**26.7**	--	--	--	--	--	**13.8**	--	--
DC-05D	YVD-090919-12	9/9/2019	N	998357	**205**	--	--	**205**	--	--	0.070	U	--	--	--	--	**78.5**	--	--	**26.5**	--	--	**0.300**	--	--	**26.2**	--	--	--	--	--	**12.5**	--	--
DC-05D	YVD-120919-05	12/9/2019	N	902276	**201**	--	--	**201**	--	--	0.070	U	--	--	--	--	**76.5**	--	--	**26.3**	--	--	**0.280**	--	--	**26.2**	--	--	--	--	--	**12.9**	--	--
DC-05D	YVD-033020-14	3/30/2020	N	006241	**202**	--	--	**202**	--	--	0.070	U	--	--	--	--	**75.5**	--	--	**27.3**	--	--	**0.250**	--	--	**26.3**	--	--	--	--	--	**12.8**	--	--
DC-05D	YVD-060820-02	6/8/2020	N	009144	**202**	--	--	**202**	--	--	0.070	U	--	--	--	--	**76.5**	--	--	**26.9**	--	--	**0.200**	--	--	**26.6**	--	--	--	--	--	**14.4**	--	--
DC-05D	YVD-060820-04	6/8/2020	FD	009144	**202**	--	--	**202**	--	--	0.070	U	--	--	--	--	**76.0**	--	--	**26.9**	--	--	**0.200**	--	--	**26.6**	--	--	--	--	--	**12.0**	--	--
DC-05D	YVD-092020-04	9/20/2020	N	013864/20I0421	**202**	--	--	**202**	--	--	0.070	U	--	--	--	--	**78.0**	--	--	**27.2**	--	--	**0.210**	--	--	**27.0**	--	--	--	--	--	**12.0**	--	--
DC-05D	YVD-092020-05	9/20/2020	FD	013864/20I0421	**202**	--	--	**202**	--	--	0.070	U	--	--	--	--	**78.5**	--	--	**27.2**	--	--	**0.220**	--	--	**26.8**	--	--	--	--	--	**12.0**	--	--
DC-05D	YVD-120720-02	12/7/2020	N	017035	**200**	--	--	**200**	--	--	0.070	U	--	--	--	--	**77.5**	--	--	**23.5**	--	--	**0.200**	--	--	**27.1**	--	--	--	--	--	**12.9**	--	--
DC-05D	YVD-120720-04	12/7/2020	FD	017035	**198**	--	--	**198**	--	--	0.070	U	--	--	--	--	**76.5**	--	--	**21.0**	--	--	**0.180**	--	--	**26.9**	--	--	--	--	--	**12.9**	--	--
DC-05D	YVD-030221-18	3/2/2021	N	120034	**206**	--	--	**206**	--	--	0.070	U	--	--	--	--	**80.5**	--	--	**27.9**	--	--	**0.230**	--	--	**27.1**	--	--	--	--	--	**12.8**	--	--
DC-05D	YVD-060721-13	6/7/2021	N	124105	**212**	--	--	**212**	--	--	0.070	U	--	--	--	--	**78.0**	--	--	**27.2**	--	--	**0.220**	--	--	**26.9**	--	--	--	--	--	**13.0**	--	--
DC-05D	YVD-121421-04	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**12.7**	J	HTQ, MS
DC-05D	YVD-031422-02	3/14/2022	N	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**14.2**	--	--
DC-05D	YVD-031422-03	3/14/2022	FD	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**14.2**	--	--
DC-05D	YVD-060522-04	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**9.83**	--	--
DC-05D	YVD-091322-03	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**9.30**	--	--
DC-05D	YVD-120622-04	12/6/2022	N	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**9.80**	--	--
DC-05D	YVD-030623-22	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**10.1**	--	--	--	--	--
DC-05D	YVD-062023-10	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**11.2**	J	HTQ
DC-07	DC-07-130103	01/03/2013	N	EPA01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**2.80**	--	--
DC-07	DC-07-130918	09/18/2013	N	SWI0123	**315**	--	--	**315**	--	--	--	--	--	0.100	U	--	**122**	--	--	**30.5**	--	--	5.00	U	--	**18.4**	--	--	--	--	--	**4.30**	--	--
DC-07	YVD-D1-130918	09/18/2013	FD	SWI0123	**295**	--	--	**295**	--	--	--	--	--	0.100	U	--	**122**	--	--	**32.8**	--	--	5.00	U	--	**18.5**	--	--	--	--	--	**4.30**	--	--
DC-07	DC-07-131210	12/10/2013	N	SWL0055	**260**	--	--	**260**	--	--	--	--	--	0.020	UJ	MSD	**27.5**	--	--	**31.0**	--	--	5.00	U	--	**11.5**	--	--	--	--	--	**4.70**	--	--
DC-07	DC-07-140316	03/16/2014	N	SXC0081	**260**	--	--	**260**	--	--	--	--	--	**0.116**	--	--	**88.4**	--	--	**26.5**	--	--	2.00	U	--	**15.4**	--	--	--	--	--	**4.72**	--	--
DC-07	DC-07-140602	06/02/2014	N	SXF0008	**245**	--	--	**245**	--	--	--	--	--	0.100	U	--	**93.7**	--	--	**28.2**	--	--	2.00	U	--	**16.5**	--	--	--	--	--	0.800	U	--
DC-07	DC-07-140922	09/22/2014	N	SXI0148	**215**	--	--	**215**	--	--	--	--	--	0.100	U	--	**87.1**	--	--	**29.8**	--	--	2.00	U	--	**16.1**	--	--	--	--	--	**4.88**	--	--
DC-07	DC-07-141216	12/16/2014	N	SXL0108	**210**	--	--	**210**	--	--	--	--	--	0.100	U	--	**83.6**	--	--	**24.2**	--	--	2.00	U	--	**15.1**	--	--	--	--	--	**2.80**	--	--
DC-07	YVD-D2-141216	12/16/2014	FD	SXL0108	**210**	--	--	**210**	--	--	--	--	--	0.100	U	--	**84.2**	--	--	**25.6**	--	--	0.500	U	--	**15.1**	--	--	--	--	--	**2.92**	--	--
DC-07	DC-07-150317	03/17/2015	N	5904541	**240**	--	--	**240**	--	--	--	--	--	0.100	U	--	**94.0**	--	--	**29.0**	--	--	2.00	U	--	**17.0**	--	--	--	--	--	**4.60**	J--	MSD
DC-07	DC-07-150617	06/17/2015	N	59011021	**230**	--	--	**230**	--	--	--	--	--	0.100	U	--	**97.0**	--	--	**32.0**	--	--	2.00	U	--	**17.0**	J	RPD	--	--	--	**4.00**	J--	MSD
DC-07	DC-07-150924	09/24/2015	N	59020391	**240**	--	--	**240**	--	--	--	--	--	0.100	UJ	MSD	**76.0**	--	--	**30.0**	--	--	2.00	U	--	**15.0**	--	--	--	--	--	**2.70**	J+	MSD
DC-07	DC-07-151215	12/15/2015	N	59025501	**240**	--	--	**240**	--	--	--	--	--	--	R	MSD	**87.0**	--	--	**29.0**	--	--	2.00	U	--	**16.0**	--	--	--	--	--	**2.50**	--	--
DC-07	DC-07-160309	03/09/2016	N	59029941	**280**	--	--	**280**	--	--	--	--	--	0.100	U	--	**91.0**	--	--	**31.0**	--	--	2.00	U	--	**17.0**	--	--	--	--	--	**2.20**	--	--
DC-07	DC-07-160621	6/21/2016	N	59037271	**250**	--	--	**250**	--	--	--	--	--	**0.100**	J--	MSD	**96.0**	--	--	**33.0**	--	--	2.00	U	--	**18.0**	--	--	--	--	--	**4.80**	--	--
DC-07	DC-07-160926	9/26/2016	N	K1611565	**204**	--	--	**204**	--	--	--	--	--	0.050	U	--	**82.3**	--	--	**24.4**	--	--	0.200	U	--	**15.0**	--	--	--	--	--	**2.74**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-07	DC-07-161214	12/14/2016	N	K1615083	**218**	--	--	**218**	--	--	--	--	--	0.050	U	--	**77.0**	--	--	**19.2**	--	--	0.200	U	--	**13.1**	--	--	--	--	--	**1.44**	--	--
DC-07	YVD-030917-25	3/9/2017	N	K1702448	**255**	--	--	**255**	--	--	--	--	--	0.050	U	--	**87.9**	--	--	**21.4**	--	--	0.200	U	--	**14.4**	--	--	--	--	--	**2.58**	--	--
DC-07	YVD-060617-18	6/6/2017	N	K1705754	**232**	--	--	**232**	--	--	--	--	--	0.050	U	--	**82.8**	--	--	**24.5**	--	--	**0.110**	J	--	**14.3**	--	--	--	--	--	**2.42**	--	--
DC-07	YVD-092517-12	9/25/2017	N	K1710333	**235**	--	--	**235**	--	--	--	--	--	0.050	U	--	**86.1**	--	--	**25.4**	--	--	**0.090**	J	--	**13.9**	--	--	--	--	--	**2.34**	--	--
DC-07	YVD-120417-14	12/4/2017	N	K1713026	**221**	--	--	**221**	--	--	--	--	--	0.050	U	--	**80.9**	--	--	**25.7**	--	--	**0.180**	J	--	**13.3**	--	--	--	--	--	**2.92**	--	--
DC-07	YVD-060318-17	6/3/2018	N	874568	**202**	--	--	**202**	--	--	0.070	U	--	--	--	--	**90.5**	--	--	**28.5**	--	--	0.100	U	--	**15.9**	--	--	--	--	--	**6.90**	--	--
DC-07	YVD-060319-20	6/3/2019	N	992053	**349**	--	--	**349**	--	--	0.070	U	--	--	--	--	**120**	--	--	**20.4**	--	--	0.100	U	--	**20.2**	--	--	--	--	--	**2.95**	--	--
DC-07	YVD-060920-18	6/9/2020	N	009269	**468**	--	--	**468**	--	--	0.070	U	--	--	--	--	**174**	--	--	**48.8**	--	--	0.100	U	--	**27.0**	--	--	--	--	--	**10.1**	--	--
DC-07	YVD-092120-22	9/21/2020	N	013896	**500**	--	--	**500**	--	--	0.070	U	--	--	--	--	**194**	--	--	**62.3**	--	--	0.100	U	--	**29.0**	--	--	--	--	--	**26.5**	--	--
DC-07	YVD-120820-22	12/8/2020	N	017137	**507**	--	--	**507**	--	--	0.070	U	--	--	--	--	**172**	--	--	**40.6**	--	--	**0.110**	--	--	**26.0**	--	--	--	--	--	**13.4**	--	--
DC-07	YVD-030121-10	3/1/2021	N	119931	**500**	--	--	**500**	--	--	0.070	U	--	--	--	--	**169**	--	--	**35.1**	--	--	0.100	U	--	**26.6**	--	--	--	--	--	**5.80**	--	--
DC-07	YVD-060721-16	6/7/2021	N	124105	**490**	--	--	**490**	--	--	0.070	U	--	--	--	--	**152**	--	--	**23.1**	--	--	0.100	U	--	**23.6**	--	--	--	--	--	**8.80**	--	--
DC-07	YVD-060721-17	6/7/2021	FD	124105	**490**	--	--	**490**	--	--	0.070	U	--	--	--	--	**150**	--	--	**23.2**	--	--	0.100	U	--	**23.4**	--	--	--	--	--	**9.90**	--	--
DC-07	YVD-121521-17	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**20.3**	J	HTQ, MS
DC-07	YVD-031522-13	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**20.1**	--	--
DC-07	YVD-060522-08	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**28.5**	--	--
DC-07	YVD-091422-16	9/14/2022	N	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**18.3**	--	--
DC-07	YVD-091422-17	9/14/2022	FD	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**18.5**	--	--
DC-07	YVD-122722-23	12/27/2022	N	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**6.20**	--	--
DC-07	YVD-030623-12	3/6/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**6.22**	--	--	--	--	--
DC-07	YVD-062123-27	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**2.50**	J	HTQ
DC-09	DC-09-130103	01/03/2013	N	EPA01	--	--	--	--	--	--	--	--	--	0.100	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**6.00**	--	--
DC-09	DC-09-130923	09/23/2013	N	SWI0178	**44.7**	--	--	**45.0**	--	--	--	--	--	0.100	U	--	**34.0**	--	--	--	--	--	--	--	--	**8.41**	--	--	--	--	--	--	--	--
DC-09	DC-09-130926	09/26/2013	N	SWI0190	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**16.2**	--	--	0.500	U	--	--	--	--	--	--	--	**6.02**	--	--
DC-09	DC-09-131211	12/11/2013	N	SWL0063	**129**	--	--	**130**	--	--	--	--	--	--	R	MSD	**34.8**	--	--	**17.4**	--	--	0.500	U	--	**7.89**	--	--	--	--	--	**6.78**	--	--
DC-09	DC-09-140317	03/17/2014	N	SXC0095	**144**	--	--	**145**	--	--	--	--	--	0.100	U	--	**35.4**	--	--	**15.6**	--	--	**0.820**	--	--	**8.43**	--	--	--	--	--	**5.85**	--	--
DC-09	DC-09-140602	06/02/2014	N	SXF0008	**129**	--	--	**130**	--	--	--	--	--	**0.106**	--	--	**33.9**	--	--	**15.9**	--	--	0.500	U	--	**8.27**	--	--	--	--	--	**6.18**	--	--
DC-09	YVD-D3-140602	06/02/2014	FD	SXF0008	**129**	--	--	**130**	--	--	--	--	--	0.100	U	--	**34.2**	--	--	**15.8**	--	--	0.500	U	--	**8.73**	--	--	--	--	--	**5.97**	--	--
DC-09	DC-09-140923	09/23/2014	N	SXI0158	**124**	--	--	**125**	--	--	--	--	--	--	R	MSD	**32.2**	--	--	**15.8**	--	--	0.500	U	--	**6.75**	--	--	--	--	--	**6.01**	--	--
DC-09	DC-09-141216	12/16/2014	N	SXL0108	**129**	--	--	**130**	--	--	--	--	--	0.100	U	--	**35.3**	--	--	**16.3**	--	--	0.500	U	--	**7.98**	--	--	--	--	--	**5.94**	--	--
DC-09	DC-09-150316	03/16/2015	N	5904541	**130**	--	--	**130**	--	--	--	--	--	**0.150**	--	--	**36.0**	--	--	**17.0**	--	--	**0.600**	--	--	**8.00**	--	--	--	--	--	**5.90**	J--	MSD
DC-09	DC-09-150616	06/16/2015	N	59010751	**130**	--	--	**130**	--	--	--	--	--	0.100	U	--	**34.0**	J+	MSD	**16.0**	--	--	0.500	U	--	**8.10**	J+	MSD	--	--	--	**5.80**	--	--
DC-09	DC-09-150923	09/23/2015	N	59020281	**140**	--	--	**140**	--	--	--	--	--	0.100	U	--	**33.0**	--	--	**16.0**	--	--	0.500	U	--	**8.10**	--	--	--	--	--	**5.80**	--	--
DC-09	DC-09-151214	12/14/2015	N	59025431	**150**	J	FDP	**150**	J	FDP	--	--	--	--	R	MSD	**34.0**	--	--	**16.0**	--	--	0.500	U	--	**8.20**	--	--	--	--	--	**5.90**	--	--
DC-09	DC-09-160308	03/08/2016	N	59029711	**130**	--	--	**130**	--	--	--	--	--	--	R	FBK, FDP	**35.0**	--	--	**16.0**	--	--	0.500	U	--	**8.80**	--	--	--	--	--	**5.70**	--	--
DC-09	YVD-D2-160308	03/08/2016	FD	59029711	**130**	--	--	**130**	--	--	--	--	--	0.100	UJ	FDP	**34.0**	--	--	**16.0**	--	--	0.500	U	--	**8.60**	--	--	--	--	--	**5.70**	--	--
DC-09	DC-09-160621	6/21/2016	N	59037151	**130**	--	--	**130**	--	--	--	--	--	0.100	UJ	--	**32.0**	--	--	**17.0**	--	--	**0.510**	--	--	**7.50**	--	--	--	--	--	**5.90**	--	--
DC-09	DC-09-160929	9/29/2016	N	K1611704	**129**	--	--	**129**	--	--	--	--	--	0.050	U	MBK	**30.6**	--	--	**14.8**	--	--	**0.380**	--	--	**6.25**	--	--	--	--	--	**5.53**	--	--
DC-09	DC-09-D4-160929	9/29/2016	FD	K1611704	**128**	--	--	**128**	--	--	--	--	--	0.050	U	MBK	**30.4**	--	--	**14.9**	--	--	**0.380**	--	--	**6.22**	--	--	--	--	--	**5.53**	--	--
DC-09	DC-09-161215	12/15/2016	N	K1615126	**127**	--	--	**127**	--	--	--	--	--	0.050	U	--	**33.0**	--	--	**15.0**	--	--	**0.410**	--	--	**6.65**	--	--	--	--	--	**5.62**	--	--
DC-09	YVD-D4-161215	12/15/2016	FD	K1615126	**127**	--	--	**127**	--	--	--	--	--	0.050	U	--	**32.8**	--	--	**15.0**	--	--	**0.420**	--	--	**6.62**	--	--	--	--	--	**5.61**	--	--
DC-09	YVD-031317-36	3/13/2017	N	K1702489	**124**	--	--	**124**	--	--	--	--	--	0.050	U	--	**33.8**	--	--	**14.6**	--	--	**0.440**	--	--	**6.75**	--	--	--	--	--	**5.54**	--	--
DC-09	YVD-060717-27	6/7/2017	N	K1705833	**126**	--	--	**126**	--	--	--	--	--	0.050	U	--	**33.3**	--	--	**14.7**	--	--	**0.400**	--	--	**6.88**	--	--	--	--	--	**5.55**	--	--
DC-09	YVD-092617-23	9/26/2017	N	K1710333	**132**	--	--	**132**	--	--	--	--	--	0.050	U	--	**32.9**	--	--	**14.7**	--	--	**0.400**	--	--	**6.71**	--	--	--	--	--	**5.47**	--	--
DC-09	YVD-120417-09	12/4/2017	N	K1713026	**129**	--	--	**129**	--	--	--	--	--	0.050	U	--	**33.0**	--	--	**15.1**	--	--	**0.430**	--	--	**6.50**	--	--	--	--	--	**5.80**	--	--
DC-09	YVD-060418-25	6/4/2018	N	874860	**127**	--	--	**127**	--	--	0.070	U	--	--	--	--	**33.4**	--	--	**14.1**	--	--	**0.390**	--	--	**7.30**	--	--	--	--	--	**5.29**	--	--
DC-09	YVD-060319-19	6/3/2019	N	992053	**128**	--	--	**128**	--	--	0.070	U	--	--	--	--	**34.5**	--	--	**13.1**	--	--	**0.390**	--	--	**7.25**	--	--	--	--	--	**5.23**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-09	YVD-060920-25	6/9/2020	N	009269	**128**	--	--	**128**	--	--	0.070	U	--	--	--	--	**34.0**	--	--	**14.4**	--	--	**0.350**	--	--	**7.15**	--	--	--	--	--	**5.60**	--	--
DC-09	YVD-060721-15	6/7/2021	N	124105	**129**	--	--	**129**	--	--	0.070	U	--	--	--	--	**34.4**	--	--	**14.8**	--	--	**0.380**	--	--	**7.35**	--	--	--	--	--	**6.20**	--	--
DC-09	YVD-060722-29	6/7/2022	N	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**6.76**	J	HTQ
DC-09	YVD-062123-22	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**6.23**	J	HTQ
DC-09	YVD-062123-23	6/21/2023	FD	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**5.92**	J	HTQ
DC-14	DC-14-130103	01/03/2013	N	EPA01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**26.0**	--	--
DC-14	DC-14-130917	09/17/2013	N	SWI0113	**454**	--	--	**455**	--	--	--	--	--	**0.115**	--	--	**121**	--	--	**80.2**	--	--	0.500	U	--	**32.3**	--	--	--	--	--	**12.0**	--	--
DC-14	DC-14-131211	12/11/2013	N	SWL0063	**434**	--	--	**435**	--	--	--	--	--	--	R	MSD	**91.2**	--	--	**64.4**	--	--	5.00	U	--	**23.9**	--	--	--	--	--	**5.80**	--	--
DC-14	DC-14-140318	03/18/2014	N	SXC0095	**494**	--	--	**495**	--	--	--	--	--	0.100	U	--	**107**	--	--	**71.8**	--	--	5.00	U	--	**28.4**	--	--	--	--	--	**10.6**	--	--
DC-14	DC-14-140602	06/02/2014	N	SXF0017	**425**	--	--	**425**	--	--	--	--	--	0.100	U	--	**95.9**	--	--	**56.1**	--	--	1.00	U	--	**26.3**	--	--	--	--	--	**6.46**	--	--
DC-14	DC-14-140923	09/23/2014	N	SXI0158	**424**	--	--	**425**	--	--	--	--	--	--	R	MSD	**106**	--	--	**63.7**	--	--	1.00	U	--	**27.6**	--	--	--	--	--	**8.90**	--	--
DC-14	DC-14-141216	12/16/2014	N	SXL0108	**429**	--	--	**430**	--	--	--	--	--	0.100	U	--	**110**	--	--	**74.4**	--	--	1.00	U	--	**31.5**	--	--	--	--	--	**10.4**	--	--
DC-14	DC-14-150316	03/16/2015	N	5904541	**490**	--	--	**490**	--	--	--	--	--	**0.160**	--	--	**140**	--	--	**80.0**	--	--	1.00	U	--	**38.0**	--	--	--	--	--	**18.0**	J--	MSD
DC-14	DC-14-150616	06/16/2015	N	59010961	**430**	--	--	**430**	--	--	--	--	--	0.100	U	--	**120**	--	--	**76.0**	--	--	1.00	U	--	**33.0**	--	--	--	--	--	**12.0**	--	--
DC-14	DC-14-150924	09/24/2015	N	59020391	**470**	--	--	**470**	--	--	--	--	--	0.100	UJ	MSD	**130**	--	--	**96.0**	--	--	1.00	U	--	**42.0**	--	--	--	--	--	**22.0**	J+	MSD
DC-14	DC-14-151214	12/14/2015	N	59025351	**550**	--	--	**550**	--	--	--	--	--	--	R	MSD	**150**	--	--	**90.0**	--	--	1.00	U	--	**43.0**	--	--	--	--	--	**21.0**	--	--
DC-14	YVD-D1-151214	12/14/2015	FD	59025351	**540**	--	--	**540**	--	--	--	--	--	--	R	MSD	**150**	--	--	**85.0**	--	--	0.500	U	--	**43.0**	--	--	--	--	--	**22.0**	--	--
DC-14	DC-14-160309	03/09/2016	N	59029711	**490**	--	--	**490**	--	--	--	--	--	0.100	UJ	FDP	**130**	--	--	**82.0**	--	--	1.00	U	--	**38.0**	--	--	--	--	--	**16.0**	--	--
DC-14	DC-14-160620	6/20/2016	N	59037151	**460**	--	--	**460**	--	--	--	--	--	0.100	U	--	**120**	--	--	**75.0**	--	--	1.00	U	--	**36.0**	--	--	--	--	--	**16.0**	--	--
DC-14	DC-14-160929	9/29/2016	N	K1611704	**394**	--	--	**394**	--	--	--	--	--	0.050	U	MBK	**97.2**	--	--	**56.4**	--	--	**0.300**	--	--	**28.9**	--	--	--	--	--	**7.19**	--	--
DC-14	DC-14-161216	12/16/2016	N	K1615174	**361**	--	--	**361**	--	--	--	--	--	0.050	U	--	**93.3**	--	--	**53.9**	--	--	**0.360**	--	--	**22.3**	--	--	--	--	--	**4.45**	--	--
DC-14	YVD-031317-38	3/14/2017	N	K1702542	**359**	--	--	**359**	--	--	--	--	--	0.050	U	--	**91.0**	--	--	**49.6**	--	--	**0.340**	--	--	**24.4**	--	--	--	--	--	**4.34**	--	--
DC-14	YVD-060617-19	6/6/2017	N	K1705754	**386**	--	--	**386**	--	--	--	--	--	0.050	U	--	**97.7**	--	--	**49.2**	--	--	**0.340**	--	--	**24.4**	--	--	--	--	--	**3.86**	--	--
DC-14	YVD-092517-11	9/25/2017	N	K1710274	**382**	--	--	**382**	--	--	--	--	--	0.050	U	--	**98.2**	--	--	**43.3**	--	--	**0.340**	--	--	**24.5**	--	--	--	--	--	**2.41**	--	--
DC-14	YVD-120617-27	12/6/2017	N	K1713157	**378**	--	--	**378**	--	--	--	--	--	0.050	U	MBK	**100**	--	--	**46.4**	--	--	**0.350**	--	--	**23.5**	--	--	--	--	--	**2.52**	--	--
DC-14	YVD-120617-29	12/6/2017	FD	K1713157	**372**	--	--	**372**	--	--	--	--	--	0.050	U	--	**97.7**	--	--	**46.0**	--	--	**0.340**	--	--	**22.8**	--	--	--	--	--	**2.52**	--	--
DC-14	YVD-031918-20	3/19/2018	N	870634	**372**	--	--	**372**	--	--	0.070	U	--	--	--	--	**95.0**	--	--	**47.9**	--	--	**0.310**	--	--	**22.6**	--	--	--	--	--	**2.86**	--	--
DC-14	YVD-060518-28	6/5/2018	N	874860	**370**	--	--	**370**	--	--	0.070	U	--	--	--	--	**92.0**	--	--	**56.5**	--	--	**0.310**	--	--	**23.5**	--	--	--	--	--	**4.00**	--	--
DC-14	YVD-060518-30	6/5/2018	FD	874860	--	R	PRS	--	R	PRS	0.070	U	--	--	--	--	**97.5**	--	--	--	R	PRS	--	R	PRS	**24.6**	--	--	--	--	--	--	R	PRS
DC-14	YVD-090918-08	9/9/2018	N	880601	**368**	--	--	**368**	--	--	0.070	U	--	--	--	--	**104**	--	--	**63.5**	--	--	**0.290**	--	--	**25.0**	--	--	--	--	--	**4.08**	--	--
DC-14	YVD-090918-10	9/9/2018	FD	880601	**363**	--	--	**363**	--	--	0.070	U	--	--	--	--	**105**	--	--	**70.8**	--	--	**0.290**	--	--	**25.1**	--	--	--	--	--	**4.00**	--	--
DC-14	YVD-121018-07	12/10/2018	N	884857	**376**	--	--	**376**	--	--	0.070	U	--	--	--	--	**105**	--	--	**72.8**	--	--	0.280	U	FBK	**25.7**	J	MSD	--	--	--	**4.60**	--	--
DC-14	YVD-031719-09	3/17/2019	N	988239	**395**	--	--	**395**	--	--	0.070	U	--	--	--	--	**118**	--	--	**83.8**	--	--	0.250	U	FBK	**27.8**	--	--	--	--	--	**5.00**	--	--
DC-14	YVD-060319-17	6/3/2019	N	992053	**395**	--	--	**395**	--	--	0.070	U	--	--	--	--	**122**	--	--	**79.7**	--	--	**0.220**	--	--	**29.7**	--	--	--	--	--	**5.35**	--	--
DC-14	YVD-091019-18	9/10/2019	N	998438	**427**	--	--	**427**	--	--	0.070	U	--	--	--	--	**132**	--	--	**89.5**	--	--	**0.240**	--	--	**32.3**	--	--	--	--	--	**7.70**	--	--
DC-14	YVD-120919-14	12/9/2019	N	902276	**438**	--	--	**438**	--	--	0.070	U	--	--	--	--	**134**	--	--	**95.2**			**0.320**			**32.9**	--	--	--	--	--	**8.00**	--	--
DC-14	YVD-033120-19	3/31/2020	N	006260	**451**	--	--	**451**	--	--	0.070	U	--	--	--	--	**134**	--	--	**87.6**	--	--	**0.240**	--	--	**32.5**	--	--	--	--	--	**9.50**	--	--
DC-14	YVD-033120-21	3/31/2020	FD	006260	**448**	--	--	**448**	--	--	0.070	U	--	--	--	--	**136**	--	--	**87.7**	--	--	**0.260**	--	--	**33.1**	--	--	--	--	--	**9.60**	--	--
DC-14	YVD-061020-32	6/10/2020	N	009361	**437**	--	--	**437**	--	--	0.070	U	--	--	--	--	**138**	--	--	**84.9**	--	--	**0.230**	--	--	**33.7**	J	MS	--	--	--	**11.5**	--	--
DC-14	YVD-061020-33	6/10/2020	FD	009361	**461**	--	--	**461**	--	--	0.070	U	--	--	--	--	**139**	--	--	**87.3**	--	--	**0.220**	--	--	**33.3**	J	MS	--	--	--	**12.0**	--	--
DC-14	YVD-092120-23	9/21/2020	N	013896	**472**	--	--	**472**	--	--	0.070	U	--	--	--	--	**150**	--	--	**90.5**	--	--	**0.210**	--	--	**36.1**	--	--	--	--	--	**17.3**	--	--
DC-14	YVD-120820-21	12/8/2020	N	017137	**496**	--	--	**496**	--	--	0.070	U	--	--	--	--	**174**	--	--	**89.4**	--	--	**0.180**	--	--	**41.5**	--	--	--	--	--	**23.6**	--	--
DC-14	YVD-030121-09	3/1/2021	N	119931	**517**	--	--	**517**	--	--	0.070	U	--	--	--	--	**186**	--	--	**90.9**	--	--	**0.240**	--	--	**44.3**	--	--	--	--	--	**31.2**	--	--
DC-14	YVD-060821-33	6/8/2021	N	124212	**563**	--	--	**563**	--	--	0.070	U	--	--	--	--	**196**	--	--	**93.4**	--	--	**0.140**	--	--	**47.1**	--	--	--	--	--	**40.2**	--	--
DC-14	YVD-121521-19	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**51.4**	J	HTQ, MS
DC-14	YVD-031522-16	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**48.8**	--	--
DC-14	YVD-060722-28	6/7/2022	N	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**57.4**	J	HTQ
DC-14	YVD-091422-18	9/14/2022	N	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**55.0**	--	--
DC-14	YVD-122822-24	12/28/2022	N	K2215296	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**55.7**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-14	YVD-030623-16	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**52.0**	--	--	--	--	--
DC-14	YVD-062023-12	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**50.5**	J	HTQ
YVD-02	YVD-02-130924	09/24/2013	N	SWI0178	**54.9**	--	--	**55.0**	--	--	--	--	--	**0.146**	--	--	**20.4**	--	--	**3.85**	--	--	0.500	U	--	**5.89**	--	--	--	--	--	**0.410**	--	--
YVD-02	YVD-02-140316	03/16/2014	N	SXC0081	**199**	--	--	**200**	--	--	--	--	--	0.100	U	--	**90.8**	--	--	**3.93**	--	--	**1.02**	--	--	**71.7**	--	--	--	--	--	0.200	U	--
YVD-02	YVD-02-140602	06/02/2014	N	SXF0008	**82.2**	--	--	**82.5**	--	--	--	--	--	0.100	U	--	**62.7**	--	--	**2.75**	--	--	0.500	U	--	**48.7**	--	--	--	--	--	0.200	U	--
YVD-02	YVD-02-140921	09/21/2014	N	SXI0148	**89.4**	--	--	**90.0**	--	--	--	--	--	0.100	U	--	**29.6**	--	--	**2.64**	--	--	0.500	U	--	**13.7**	J	FDP	--	--	--	0.200	U	--
YVD-02	YVD-D1-140921	09/21/2014	FD	SXI0148	**89.4**	--	--	**90.0**	--	--	--	--	--	0.100	U	--	**35.8**	--	--	**2.20**	--	--	0.500	U	--	**18.2**	J	FDP	--	--	--	0.200	U	--
YVD-02	YVD-02-141215	12/15/2014	N	SXL0103	**94.7**	--	--	**95.0**	--	--	--	--	--	0.100	U	--	**35.7**	--	--	**2.90**	J+	MSD	0.500	U	--	**17.4**	--	--	--	--	--	**0.220**	J	DUP
YVD-02	YVD-02-150615	06/15/2015	N	59010751	**75.0**	J+	FBK	**75.0**	J+	FBK	--	--	--	**0.110**	--	--	**32.0**	J+	MSD	**2.60**	--	--	0.500	U	--	**16.0**	J+	MSD	--	--	--	**0.230**	--	--
YVD-02	YVD-02-150923	09/23/2015	N	59020281	**95.0**	--	--	**95.0**	--	--	--	--	--	0.100	U	--	**28.0**	--	--	**2.50**	--	--	0.500	U	--	**17.0**	--	--	--	--	--	0.200	U	--
YVD-02	YVD-02-151214	12/14/2015	N	59025351	**100.0**	--	--	**100.0**	--	--	--	--	--	--	R	MSD	**38.0**	--	--	**2.60**	--	--	0.500	U	--	**23.0**	--	--	--	--	--	0.200	U	--
YVD-02	YVD-02-160308	03/08/2016	N	59029521	**110**	J	FDP	**110**	J	FDP	--	--	--	0.100	UJ	RPD	**32.0**	--	--	**3.00**	--	--	**0.570**	--	--	**20.0**	--	--	--	--	--	0.200	U	--
YVD-02	YVD-02-160620	6/20/2016	N	59037101	**75.0**	--	--	**75.0**	--	--	--	--	--	0.100	U	--	**25.0**	--	--	**2.90**	--	--	0.500	U	--	**10.0**	--	--	--	--	--	**0.310**	--	--
YVD-02	YVD-02-160928	9/28/2016	N	K1611629	**72.0**	--	--	**72.0**	--	--	--	--	--	0.050	U	MBK	**17.2**	--	--	**2.79**	J	DUP	**0.160**	J	--	**4.64**	--	--	--	--	--	**0.130**	--	--
YVD-02	YVD-030817-15	3/8/2017	N	K1702324	**103**	--	--	**103**	--	--	--	--	--	1.00	U	--	**30.2**	--	--	**3.85**	--	--	**0.210**	--	--	**7.22**	--	--	--	--	--	**5.40**	--	--
YVD-02	YVD-060617-14	6/6/2017	N	K1705754	**81.0**	--	--	**81.0**	--	--	--	--	--	0.050	U	--	**20.9**	--	--	**3.03**	--	--	**0.160**	J	--	**4.85**	--	--	--	--	--	**0.200**	--	--
YVD-02	YVD-060617-16	6/6/2017	FD	K1705754	**67.0**	--	--	**67.0**	--	--	--	--	--	0.050	U	--	**20.2**	--	--	**2.95**	--	--	**0.150**	J	--	**4.74**	--	--	--	--	--	**0.200**	--	--
YVD-02	YVD-092617-20	9/26/2017	N	K1710333	**75.0**	--	--	**75.0**	--	--	--	--	--	0.050	U	--	**17.7**	--	--	**2.63**	--	--	**0.150**	J	--	**4.64**	--	--	--	--	--	**0.170**	--	--
YVD-02	YVD-120417-02	12/4/2017	N	K1713026	**89.0**	--	--	**89.0**	--	--	--	--	--	0.050	U	--	**20.0**	--	--	**2.37**	--	--	**0.290**	--	--	**7.43**	--	--	--	--	--	**0.220**	--	--
YVD-02	YVD-120417-04	12/4/2017	FD	K1713026	**93.0**	--	--	**93.0**	--	--	--	--	--	0.050	U	--	**19.6**	--	--	**2.20**	--	--	**0.310**	--	--	**7.74**	--	--	--	--	--	**0.200**	--	--
YVD-02	YVD-061218-32	6/12/2018	N	875438	--	R	NR	--	R	NR	--	R	NR	--	--	--	--	R	NR	--	R	NR	--	R	NR	--	R	NR	--	--	--	--	R	NR
YVD-02	YVD-060419-28	6/4/2019	N	992242	**191**	--	--	**191**	--	--	0.070	U	--	--	--	--	**54.0**	--	--	**12.5**	--	--	**0.180**	--	--	**19.6**	--	--	--	--	--	**33.9**	J	HTQ
YVD-02	YVD-070219-33	7/2/2019	N	994356	**204**	--	--	**204**	--	--	0.070	U	--	--	--	--	**87.0**	--	--	**13.0**	--	--	**0.190**	--	--	**32.4**	--	--	--	--	--	**36.1**	--	--
YVD-02	YVD-091019-19	9/10/2019	N	998438	**200**	--	--	**200**	--	--	0.070	U	--	--	--	--	**97.0**	--	--	**11.3**	--	--	**0.130**	--	--	**27.0**	--	--	--	--	--	**43.6**	--	--
YVD-02	YVD-121019-23	12/10/2019	N	902321	**226**	--	--	**226**	--	--	0.070	U	--				**85.0**	--	--	**11.6**	--	--	**0.330**	--	--	**31.6**	--	--	--	--	--	**38.9**	--	--
YVD-02	YVD-040120-23	4/1/2020	N	006311	**237**	--	--	**237**	--	--	0.070	U	--	--	--	--	**59.5**	--	--	**11.7**	--	--	**0.550**	--	--	**25.4**	--	--	--	--	--	**20.6**	--	--
YVD-02	YVD-061120-35	6/11/2020	N	009430	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**15.5**	--	--
YVD-02	NS[1]	9/21/2020	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	12/8/2020	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	3/1/2021	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	6/8/2021	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	12/15/2021	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	3/15/2022	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	6/7/2022	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	9/12/2022	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	12/5/2022	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	3/6/2023	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	6/20/2023	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-03	YVD-03-130916	09/16/2013	N	SWI0113	**209**	--	--	**210**	--	--	--	--	--	0.100	U	--	**57.5**	--	--	**14.0**	--	--	**0.740**	--	--	**24.3**	--	--	--	--	--	**4.75**	--	--
YVD-03	YVD-03-131210	12/10/2013	N	SWL0063	**214**	--	--	**215**	--	--	--	--	--	--	R	MSD	**48.7**	--	--	**14.3**	--	--	1.00	U	--	**20.4**	--	--	--	--	--	**5.96**	--	--
YVD-03	YVD-03-140317	03/17/2014	N	SXC0081	**219**	--	--	**220**	--	--	--	--	--	**0.249**	--	--	**51.2**	--	--	**13.3**	--	--	**1.03**	--	--	**18.2**	--	--	--	--	--	**4.75**	--	--
YVD-03	YVD-03-140602	06/02/2014	N	SXF0008	**206**	--	--	**208**	--	--	--	--	--	0.100	U	--	**46.4**	--	--	**10.7**	--	--	0.500	U	--	**16.8**	--	--	--	--	--	**3.86**	--	--
YVD-03	YVD-03-140923	09/23/2014	N	SXI0158	**199**	--	--	**200**	--	--	--	--	--	--	R	MSD	**52.2**	--	--	**11.8**	--	--	**0.620**	--	--	**19.5**	--	--	--	--	--	**3.97**	--	--
YVD-03	YVD-D3-140923	09/23/2014	FD	SXI0158	**199**	--	--	**200**	--	--	--	--	--	--	R	MSD	**45.4**	--	--	**12.1**	--	--	**0.650**	--	--	**16.2**	--	--	--	--	--	**4.04**	--	--
YVD-03	YVD-03-141215	12/15/2014	N	SXL0108	**199**	--	--	**200**	--	--	--	--	--	0.100	U	--	**51.7**	--	--	**12.9**	--	--	**0.540**	--	--	**19.3**	--	--	--	--	--	**4.27**	--	--
YVD-03	YVD-03-150316	03/16/2015	N	5904541	**210**	--	--	**210**	--	--	--	--	--	0.100	U	--	**46.0**	--	--	**13.0**	--	--	**0.840**	--	--	**17.0**	--	--	--	--	--	**4.10**	J--	MSD
YVD-03	YVD-03-150616	06/16/2015	N	59010751	**200**	--	--	**200**	--	--	--	--	--	**0.120**	--	--	**50.0**	J+	MSD	**12.0**	--	--	**0.680**	--	--	**20.0**	J+	MSD	--	--	--	**4.00**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-03	YVD-03-150922	09/22/2015	N	59020141	**220**	--	--	**220**	--	--	--	--	--	0.100	U	--	**43.0**	--	--	**14.0**	--	--	**0.660**	--	--	**19.0**	--	--	--	--	--	**4.90**	--	--
YVD-03	YVD-03-151214	12/14/2015	N	59025351	**230**	--	--	**230**	--	--	--	--	--	--	R	MSD	**49.0**	--	--	**14.0**	--	--	**0.740**	--	--	**22.0**	--	--	--	--	--	**4.90**	--	--
YVD-03	YVD-03-160307	03/07/2016	N	59029521	**150**	J	FDP	**150**	J	FDP	--	--	--	0.100	UJ	RPD	**43.0**	--	--	**13.0**	--	--	**0.720**	--	--	**20.0**	--	--	--	--	--	**4.60**	--	--
YVD-03	YVD-03-160620	6/20/2016	N	59037151	**190**	--	--	**190**	--	--	--	--	--	0.100	U	--	**46.0**	--	--	**14.0**	--	--	**0.760**	--	--	**21.0**	--	--	--	--	--	**4.60**	--	--
YVD-03	YVD-03-160929	9/29/2016	N	K1611758	**196**	--	--	**196**	--	--	--	--	--	0.050	U	MBK	**43.2**	--	--	**11.7**	--	--	**0.610**	--	--	**18.3**	--	--	--	--	--	**4.39**	--	--
YVD-03	YVD-03-161213	12/13/2016	N	K1615045	**189**	--	--	**189**	--	--	--	--	--	0.050	U	--	**40.0**	--	--	**11.6**	--	--	**0.690**	--	--	**17.4**	--	--	--	--	--	**4.47**	--	--
YVD-03	YVD-030617-02	3/6/2017	N	K1702228	**190**	--	--	**190**	--	--	--	--	--	0.050	U	--	**41.6**	--	--	**11.4**	--	--	**0.600**	--	--	**17.3**	--	--	--	--	--	**4.42**	--	--
YVD-03	YVD-030617-03	3/6/2017	FD	K1702228	**192**	--	--	**192**	--	--	--	--	--	0.050	U	--	**41.5**	--	--	**11.6**	--	--	**0.650**	--	--	**17.3**	--	--	--	--	--	**4.48**	--	--
YVD-03	YVD-060517-13	6/5/2017	N	K1705702	**189**	--	--	**189**	--	--	--	--	--	0.050	U	--	**41.9**	--	--	**11.9**	--	--	**0.660**	--	--	**18.1**	--	--	--	--	--	**4.61**	--	--
YVD-03	YVD-092517-05	9/25/2017	N	K1710274	**193**	--	--	**193**	--	--	--	--	--	0.050	U	--	**41.6**	--	--	**11.6**	--	--	**0.660**	--	--	**18.7**	--	--	--	--	--	**4.45**	--	--
YVD-03	YVD-120517-19	12/5/2017	N	K1713091	**181**	--	--	**181**	--	--	--	--	--	0.050	U	--	**41.9**	--	--	**11.1**	--	--	**0.640**	--	--	**17.4**	--	--	--	--	--	**4.52**	--	--
YVD-03	YVD-060518-27	6/5/2018	N	874860	**188**	--	--	**188**	--	--	0.070	U	--	--	--	--	**39.0**	--	--	**11.3**	--	--	**0.620**	--	--	**17.4**	--	--	--	--	--	**4.70**	--	--
YVD-03	YVD-060219-07	6/2/2019	N	991939	**185**	--	--	**185**	--	--	0.070	U	--	--	--	--	**40.3**	--	--	8.19	U	FBK	0.440	U	FBK	**17.2**	--	--	--	--	--	**3.16**	--	--
YVD-03	YVD-060820-09	6/8/2020	N	009144	**184**	--	--	**184**	--	--	0.070	U	--	--	--	--	**40.5**	--	--	**11.6**	--	--	**0.560**	--	--	**17.6**	--	--	--	--	--	**5.20**	--	--
YVD-03	YVD-060821-24	6/8/2021	N	124212	**182**	--	--	**182**	--	--	0.070	U	--	--	--	--	**42.2**	--	--	**8.09**	--	--	**0.370**	--	--	**17.8**	--	--	--	--	--	**3.23**	--	--
YVD-03	YVD-060822-31	6/8/2022	N	K2206299	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**5.08**	--	--
YVD-03	YVD-060822-32	6/8/2022	FD	K2206299	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**5.10**	--	--
YVD-03	YVD-061923-04	6/19/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**4.97**	J	HTQ
YVD-04	YVD-04-130916	09/16/2013	N	SWI0113	**184**	--	--	**185**	--	--	--	--	--	0.100	U	--	**37.4**	--	--	**14.9**	--	--	0.500	U	--	**11.2**	--	--	--	--	--	**4.45**	--	--
YVD-04	YVD-04-131210	12/10/2013	N	SWL0063	**203**	--	--	**205**	--	--	--	--	--	--	R	MSD	**38.2**	--	--	**15.0**	--	--	1.00	U	--	**11.7**	--	--	--	--	--	**4.64**	--	--
YVD-04	YVD-04-140317	03/17/2014	N	SXC0081	**209**	--	--	**210**	--	--	--	--	--	0.100	U	--	**37.7**	--	--	**15.1**	--	--	**0.630**	--	--	**11.6**	--	--	--	--	--	**4.03**	--	--
YVD-04	YVD-04-140602	06/02/2014	N	SXF0008	**191**	--	--	**193**	--	--	--	--	--	**0.113**	--	--	**36.8**	--	--	**14.3**	--	--	1.00	U	--	**11.5**	--	--	--	--	--	**3.78**	--	--
YVD-04	YVD-04-140923	09/23/2014	N	SXI0158	**188**	--	--	**190**	--	--	--	--	--	--	R	MSD	**37.8**	--	--	**15.3**	--	--	0.500	U	--	**11.5**	--	--	--	--	--	**3.87**	--	--
YVD-04	YVD-04-141215	12/15/2014	N	SXL0108	**188**	--	--	**190**	--	--	--	--	--	0.100	U	--	**38.8**	--	--	**15.2**	--	--	0.500	U	--	**12.4**	--	--	--	--	--	**3.81**	--	--
YVD-04	YVD-04-150315	03/15/2015	N	5904471	**190**	--	--	**190**	--	--	--	--	--	0.100	U	--	**38.0**	--	--	**16.0**	--	--	0.500	U	--	**12.0**	--	--	--	--	--	**4.30**	--	--
YVD-04	YVD-04-150615	06/15/2015	N	59010751	**190**	--	--	**190**	--	--	--	--	--	0.100	U	--	**38.0**	J+	MSD	**15.0**	--	--	0.500	U	--	**8.50**	J+	MSD	--	--	--	**4.00**	--	--
YVD-04	YVD-04-150922	09/22/2015	N	59020141	**200**	--	--	**200**	--	--	--	--	--	**0.130**	--	--	**36.0**	--	--	**15.0**	--	--	0.500	U	--	**11.0**	--	--	--	--	--	**3.90**	--	--
YVD-04	YVD-04-151213	12/13/2015	N	59025351	**200**	--	--	**200**	--	--	--	--	--	--	R	MSD	**39.0**	--	--	**15.0**	--	--	0.500	U	--	**12.0**	--	--	--	--	--	**4.10**	--	--
YVD-04	YVD-04-160307	03/07/2016	N	59029521	**250**	J	FDP	**250**	J	FDP	--	--	--	0.100	UJ	RPD	**36.0**	--	--	**14.0**	--	--	0.500	U	--	**12.0**	--	--	--	--	--	**3.70**	--	--
YVD-04	YVD-04-160620	6/20/2016	N	59037101	**190**	--	--	**190**	--	--	--	--	--	0.100	U	--	**36.0**	--	--	**15.0**	--	--	0.500	U	--	**12.0**	--	--	--	--	--	**4.00**	--	--
YVD-04	YVD-D1-160620	6/20/2016	FD	59037101	**180**	--	--	**180**	--	--	--	--	--	0.100	U	--	**35.0**	--	--	**15.0**	--	--	0.500	U	--	**12.0**	--	--	--	--	--	**4.00**	--	--
YVD-04	YVD-04-160928	9/28/2016	N	K1611629	**187**	--	--	**187**	--	--	--	--	--	0.050	U	--	**34.7**	--	--	**13.2**	--	--	**0.210**	--	--	**10.7**	--	--	--	--	--	**3.67**	--	--
YVD-04	YVD-04-D3-160928	9/28/2016	FD	K1611629	**185**	--	--	**185**	--	--	--	--	--	0.050	U	MBK	**34.7**	--	--	**13.2**	--	--	**0.200**	--	--	**10.9**	--	--	--	--	--	**3.68**	--	--
YVD-04	YVD-04-161213	12/13/2016	N	K1615045	**181**	--	--	**181**	--	--	--	--	--	0.050	U	--	**35.2**	--	--	**13.2**	--	--	**0.230**	--	--	**10.9**	--	--	--	--	--	**3.74**	--	--
YVD-04	YVD-031017-28	3/10/2017	N	K1702448	**167**	--	--	**167**	--	--	--	--	--	0.050	U	--	**37.8**	--	--	**13.2**	--	--	**0.210**	--	--	**10.9**	--	--	--	--	--	**3.70**	--	--
YVD-04	YVD-060517-11	6/5/2017	N	K1705702	**182**	--	--	**182**	--	--	--	--	--	0.050	U	--	**36.5**	--	--	**13.0**	--	--	**0.220**	--	--	**9.85**	--	--	--	--	--	**3.53**	--	--
YVD-04	YVD-092517-07	9/25/2017	N	K1710274	**188**	--	--	**188**	--	--	--	--	--	0.050	U	--	**37.2**	--	--	**12.9**	--	--	**0.210**	--	--	**11.7**	--	--	--	--	--	**3.57**	--	--
YVD-04	YVD-120417-13	12/4/2017	N	K1713091	**185**	--	--	**185**	--	--	--	--	--	0.050	U	--	**36.5**	--	--	**13.2**	--	--	**0.240**	--	--	**10.9**	--	--	--	--	--	**3.79**	--	--
YVD-04	YVD-060418-21	6/4/2018	N	874662	**179**	--	--	**179**	--	--	0.080	U	FBK	--	--	--	**37.0**	--	--	**12.3**	--	--	**0.190**	--	--	**11.7**	--	--	--	--	--	**4.10**	--	--
YVD-04	YVD-060219-05	6/2/2019	N	991939	**181**	--	--	**181**	--	--	0.070	U	--	--	--	--	**36.2**	--	--	22.9	U	FBK	0.790	U	FBK	**11.1**	--	--	--	--	--	**3.85**	--	--
YVD-04	YVD-060820-05	6/8/2020	N	009144	**182**	--	--	**182**	--	--	0.070	U	--	--	--	--	**34.9**	--	--	**12.7**	--	--	**0.160**	--	--	**10.9**	--	--	--	--	--	**4.10**	--	--
YVD-04	YVD-060821-22	6/8/2021	N	124212	**182**	--	--	**182**	--	--	0.070	U	--	--	--	--	**35.4**	--	--	**12.5**	--	--	**0.160**	--	--	**10.7**	--	--	--	--	--	**3.73**	--	--
YVD-04	YVD-060622-17	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**4.70**	--	--
YVD-04	YVD-061923-03	6/19/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**3.93**	J	HTQ
YVD-05	YVD-05-130917	09/17/2013	N	SWI0113	**184**	--	--	**185**	--	--	--	--	--	**0.112**	--	--	**66.0**	--	--	**10.2**	--	--	0.500	U	--	**31.0**	--	--	--	--	--	**4.90**	--	--
YVD-05	YVD-05-131211	12/11/2013	N	SWL0063	**174**	--	--	**175**	--	--	--	--	--	--	R	MSD	**41.5**	--	--	**10.0**	--	--	1.00	U	--	**17.0**	--	--	--	--	--	**4.36**	--	--
YVD-05	YVD-05-140317	03/17/2014	N	SXC0081	**174**	--	--	**175**	--	--	--	--	--	0.100	U	--	**33.7**	--	--	**8.40**	--	--	**1.30**	--	--	**13.5**	--	--	--	--	--	**3.30**	--	--
YVD-05	YVD-05-140601	06/01/2014	N	SXF0008	**164**	--	--	**165**	--	--	--	--	--	0.100	U	--	**30.8**	--	--	**8.40**	--	--	1.00	U	--	**13.2**	--	--	--	--	--	**3.00**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-05	YVD-05-140922	09/22/2014	N	SXI0148	**159**	--	--	**160**	--	--	--	--	--	0.100	U	--	**31.6**	--	--	**7.60**	--	--	1.00	U	--	**13.7**	--	--	--	--	--	**2.82**	--	--
YVD-05	YVD-05-141215	12/15/2014	N	SXL0103	**154**	--	--	**155**	--	--	--	--	--	0.100	U	--	**36.9**	--	--	**4.56**	J+	MSD, FDP	1.00	U	--	**17.0**	--	--	--	--	--	**1.50**	J	FDP, DUP
YVD-05	YVD-D1-141215	12/15/2014	FD	SXL0103	**153**	--	--	**155**	--	--	--	--	--	0.100	U	--	**34.2**	--	--	**7.80**	J+	MSD, FDP	0.500	U	--	**15.0**	--	--	--	--	--	**2.65**	J	FDP, DUP
YVD-05	YVD-05-150316	03/16/2015	N	5904471	**160**	--	--	**160**	--	--	--	--	--	0.100	U	--	**33.0**	--	--	**8.00**	--	--	1.00	U	--	**15.0**	--	--	--	--	--	**2.80**	--	--
YVD-05	YVD-05-150616	06/16/2015	N	59010751	**170**	--	--	**170**	--	--	--	--	--	0.100	U	--	**35.0**	J+	MSD	**8.90**	--	--	1.00	U	--	**16.0**	J+	MSD	--	--	--	**3.10**	--	--
YVD-05	YVD-05-150922	09/22/2015	N	59020281	**160**	--	--	**160**	--	--	--	--	--	0.100	U	--	**42.0**	--	--	**8.80**	--	--	1.00	U	--	**20.0**	--	--	--	--	--	**3.00**	--	--
YVD-05	YVD-05-151214	12/14/2015	N	59025351	**180**	--	--	**180**	--	--	--	--	--	--	R	MSD	**37.0**	--	--	**7.90**	--	--	1.00	U	--	**17.0**	--	--	--	--	--	**2.80**	--	--
YVD-05	YVD-05-160307	03/07/2016	N	59029521	**160**	J	FDP	**160**	J	FDP	--	--	--	0.100	UJ	RPD	**32.0**	--	--	**8.30**	--	--	1.00	U	--	**15.0**	--	--	--	--	--	**2.70**	--	--
YVD-05	YVD-D1-160307	03/07/2016	FD	59029521	**170**	J	FDP	**170**	J	FDP	--	--	--	0.100	UJ	RPD	**32.0**	--	--	**8.70**	--	--	**0.590**	--	--	**15.0**	--	--	--	--	--	**2.90**	--	--
YVD-05	YVD-05-160620	6/20/2016	N	59037151	**170**	--	--	**170**	--	--	--	--	--	0.100	U	--	**31.0**	--	--	**9.10**	--	--	1.00	U	--	**14.0**	--	--	--	--	--	**3.00**	--	--
YVD-05	YVD-05-160928	9/28/2016	N	K1611698	**171**	--	--	**171**	--	--	--	--	--	0.050	U	MBK	**32.1**	--	--	**8.37**	--	--	**0.440**	--	--	**13.8**	--	--	--	--	--	**3.12**	--	--
YVD-05	YVD-05-161215	12/15/2016	N	K1615174	**163**	--	--	**163**	--	--	--	--	--	0.050	U	--	**33.3**	--	--	**8.30**	--	--	**0.480**	--	--	**13.1**	--	--	--	--	--	**3.15**	--	--
YVD-05	YVD-031317-32	3/13/2017	N	K1702489	**166**	--	--	**166**	--	--	--	--	--	0.050	U	--	**31.4**	--	--	**7.89**	--	--	**0.490**	--	--	**14.1**	--	--	--	--	--	**2.88**	--	--
YVD-05	YVD-031317-34	3/13/2017	FD	K1702489	**168**	--	--	**168**	--	--	--	--	--	0.050	U	--	**31.4**	--	--	**7.92**	--	--	**0.480**	--	--	**14.0**	--	--	--	--	--	**2.91**	--	--
YVD-05	YVD-060617-23	6/6/2017	N	K1705754	**168**	--	--	**168**	--	--	--	--	--	0.050	U	--	**31.6**	--	--	**8.12**	--	--	**0.470**	--	--	**13.9**	--	--	--	--	--	**2.90**	--	--
YVD-05	YVD-092517-09	9/25/2017	N	K1710274	**173**	--	--	**173**	--	--	--	--	--	0.050	U	--	**35.3**	--	--	**8.01**	--	--	**0.470**	--	--	**14.6**	--	--	--	--	--	**2.82**	--	--
YVD-05	YVD-120517-15	12/5/2017	N	K1713091	**171**	--	--	**171**	--	--	--	--	--	0.050	U	MBK	**31.3**	--	--	**7.92**	--	--	**0.510**	--	--	**13.5**	--	--	--	--	--	**2.81**	--	--
YVD-05	YVD-060518-29	6/5/2018	N	874860	**170**	--	--	**170**	--	--	0.070	U	--	--	--	--	**31.6**	--	--	**8.29**	--	--	**0.440**	--	--	**14.2**	--	--	--	--	--	**2.79**	--	--
YVD-05	YVD-060219-09	6/2/2019	N	991939	**176**	--	--	**176**	--	--	0.070	U	--	--	--	--	**33.2**	--	--	6.43	U	FBK	0.310	U	FBK	**14.4**	--	--	--	--	--	**2.18**	--	--
YVD-05	YVD-060920-15	6/9/2020	N	009269	**182**	--	--	**182**	--	--	0.070	U	--	--	--	--	**35.4**	--	--	**9.24**	--	--	**0.390**	--	--	**15.4**	--	--	--	--	--	**3.88**	--	--
YVD-05	YVD-060821-26	6/8/2021	N	124212	**198**	--	--	**198**	--	--	0.070	U	--	--	--	--	**39.6**	--	--	**11.0**	--	--	**0.680**	--	--	**17.3**	--	--	--	--	--	**4.50**	--	--
YVD-05	YVD-060622-19	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**5.60**	--	--
YVD-05	YVD-062023-09	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**6.18**	J	HTQ
YVD-06	YVD-06-130917	09/17/2013	N	SWI0113	**149**	--	--	**150**	--	--	--	--	--	0.100	U	--	**46.0**	--	--	**3.13**	--	--	0.500	U	--	**12.8**	--	--	--	--	--	**0.510**	--	--
YVD-06	YVD-06-131209	12/09/2013	N	SWL0055	**154**	--	--	**155**	--	--	--	--	--	0.020	UJ	MSD	**31.2**	J	FDP	**2.73**	--	--	0.500	U	--	**5.27**	J	FDP	--	--	--	**0.490**	J	FDP
YVD-06	YVD-D1-131209	12/09/2013	FD	SWL0055	**159**	--	--	**160**	--	--	--	--	--	0.020	UJ	MSD	**38.9**	J	FDP	8.00	U	--	5.00	U	--	**6.55**	J	FDP	--	--	--	**6.400**	J	FDP
YVD-06	YVD-06-140316	03/16/2014	N	SXC0081	**174**	--	--	**175**	--	--	--	--	--	0.100	U	--	**40.1**	--	--	**3.47**	--	--	**0.580**	--	--	**7.59**	--	--	--	--	--	**0.610**	--	--
YVD-06	YVD-D1-140316	03/16/2014	FD	SXC0081	**159**	--	--	**160**	--	--	--	--	--	0.100	U	--	**40.5**	--	--	**3.16**	--	--	**0.550**	--	--	**7.78**	--	--	--	--	--	**0.620**	--	--
YVD-06	YVD-06-140601	06/01/2014	N	SXF0008	**156**	--	--	**158**	--	--	--	--	--	**0.172**	--	--	**37.8**	--	--	**2.88**	J	DUP	0.500	U	--	**6.50**	--	--	--	--	--	**0.510**	--	--
YVD-06	YVD-D1-140601	06/01/2014	FD	SXF0008	**153**	--	--	**155**	--	--	--	--	--	0.100	U	--	**38.3**	--	--	**2.95**	--	--	0.500	U	--	**6.56**	--	--	--	--	--	**0.560**	--	--
YVD-06	YVD-06-140921	09/21/2014	N	SXI0148	**149**	--	--	**150**	--	--	--	--	--	**0.139**	--	--	**41.3**	--	--	**2.45**	--	--	0.500	U	--	**8.52**	--	--	--	--	--	**0.440**	--	--
YVD-06	YVD-06-141215	12/15/2014	N	SXL0103	**149**	--	--	**150**	--	--	--	--	--	0.100	U	--	**40.3**	--	--	**2.50**	J+	MSD	0.500	U	--	**7.83**	--	--	--	--	--	**0.450**	J	DUP
YVD-06	YVD-06-150316	03/16/2015	N	5904471	**150**	--	--	**150**	--	--	--	--	--	0.100	U	--	**38.0**	--	--	**2.80**	--	--	0.500	U	--	**6.80**	--	--	--	--	--	**0.990**	--	--
YVD-06	YVD-06-150616	06/16/2015	N	59010751	**150**	--	--	**150**	--	--	--	--	--	0.100	U	--	**40.0**	J+	MSD	**2.70**	--	--	0.500	U	--	**7.00**	J+	MSD	--	--	--	**0.530**	--	--
YVD-06	YVD-06-150922	09/22/2015	N	59020141	**170**	--	--	**170**	--	--	--	--	--	**0.110**	--	--	**41.0**	--	--	**2.80**	--	--	0.500	U	--	**9.80**	--	--	--	--	--	**0.510**	--	--
YVD-06	YVD-06-151214	12/14/2015	N	59025351	**170**	--	--	**170**	--	--	--	--	--	--	R	MSD	**42.0**	--	--	**2.40**	--	--	0.500	U	--	**7.30**	--	--	--	--	--	**0.510**	--	--
YVD-06	YVD-06-160307	03/07/2016	N	59029521	**160**	J	FDP	**160**	J	FDP	--	--	--	0.100	UJ	RPD	**38.0**	--	--	**2.80**	--	--	0.500	U	--	**7.20**	--	--	--	--	--	**0.510**	--	--
YVD-06	YVD-06-160620	6/20/2016	N	59037151	**150**	--	--	**150**	--	--	--	--	--	0.100	U	--	**37.0**	--	--	**3.10**	--	--	0.500	U	--	**6.60**	--	--	--	--	--	**0.530**	--	--
YVD-06	YVD-06-160929	9/29/2016	N	K1611704	**145**	--	--	**145**	--	--	--	--	--	0.050	U	MBK	**35.7**	--	--	**2.64**	--	--	**0.200**	--	--	**6.12**	--	--	--	--	--	**0.550**	--	--
YVD-06	YVD-06-161215	12/15/2016	N	K1615126	**136**	--	--	**136**	--	--	--	--	--	0.050	U	--	**33.5**	--	--	**3.14**	--	--	**0.230**	--	--	**5.73**	--	--	--	--	--	**0.700**	--	--
YVD-06	YVD-030617-04	3/6/2017	N	K1702228	**142**	--	--	**142**	--	--	--	--	--	**0.021**	J	--	**35.2**	--	--	**2.83**	--	--	**0.290**	--	--	**5.84**	--	--	--	--	--	**0.610**	--	--
YVD-06	YVD-060617-21	6/6/2017	N	K1705754	**144**	--	--	**144**	--	--	--	--	--	0.050	U	--	**36.9**	--	--	**2.54**	--	--	**0.190**	J	--	**6.07**	--	--	--	--	--	**0.510**	--	--
YVD-06	YVD-092617-17	9/26/2017	N	K1710333	**140**	--	--	**140**	--	--	--	--	--	0.050	U	--	**35.0**	--	--	**2.94**	--	--	**0.230**	--	--	**5.82**	--	--	--	--	--	**0.620**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-06	YVD-092617-18	9/26/2017	FD	K1710333	**140**	--	--	**140**	--	--	--	--	--	0.050	U	--	**34.6**	--	--	**2.95**	--	--	**0.220**	--	--	**5.77**	--	--	--	--	--	**0.620**	--	--
YVD-06	YVD-120517-17	12/5/2017	N	K1713091	**137**	--	--	**137**	--	--	--	--	--	0.050	U	MBK	**34.7**	--	--	**3.23**	--	--	**0.250**	--	--	**5.81**	--	--	--	--	--	**0.730**	--	--
YVD-06	YVD-060318-15	6/3/2018	N	874568	**138**	--	--	**138**	--	--	0.090	U	FBK	--	--	--	**37.5**	--	--	**2.69**	--	--	**0.180**	--	--	**6.45**	--	--	--	--	--	**0.560**	--	--
YVD-06	YVD-060219-11	6/2/2019	N	991939	**134**	--	--	**134**	--	--	0.070	U	--	--	--	--	**35.6**	--	--	2.50	U	FBK	0.150	U	FBK	**6.05**	--	--	--	--	--	**0.510**	--	--
YVD-06	YVD-060920-17	6/9/2020	N	009269	**132**	--	--	**132**	--	--	0.070	U	--	--	--	--	**34.2**	--	--	**3.20**	--	--	**0.170**	--	--	**5.90**	--	--	--	--	--	**0.700**	--	--
YVD-06	YVD-060721-19	6/7/2021	N	124105	**160**	--	--	**160**	--	--	0.070	U	--	--	--	--	**34.0**	--	--	**4.95**	--	--	**0.250**	--	--	**5.90**	--	--	--	--	--	**0.670**	--	--
YVD-06	YVD-062023-06	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**0.76**	J	HTQ
YVD-06	YVD-062023-07	6/20/2023	FD	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**0.75**	J	HTQ
YVD-07	YVD-07-130923	09/23/2013	N	SWI0178	**79.4**	--	--	**80.0**	--	--	--	--	--	0.100	U	--	**27.7**	--	--	--	--	--	--	--	--	**16.2**	--	--	--	--	--	--	--	--
YVD-07	YVD-07-130926	09/26/2013	N	SWI0190	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**7.53**	--	--	0.500	U	--	--	--	--	--	--	--	**4.40**	--	--
YVD-07	YVD-07-131210	12/10/2013	N	SWL0055	**135**	--	--	**135**	--	--	--	--	--	0.020	UJ	MSD	**99.2**	--	--	**8.46**	--	--	**0.550**	--	--	**16.0**	--	--	--	--	--	**5.30**	--	--
YVD-07	YVD-07-140316	03/16/2014	N	SXC0081	**134**	--	--	**135**	--	--	--	--	--	**0.116**	--	--	**33.4**	--	--	**11.6**	--	--	**0.830**	--	--	**14.1**	--	--	--	--	--	**3.90**	--	--
YVD-07	YVD-07-140604	06/04/2014	N	SXF0025	**137**	--	--	**138**	--	--	--	--	--	0.100	U	--	**38.4**	--	--	**9.74**	--	--	1.00	U	--	**18.3**	--	--	--	--	--	**3.36**	--	--
YVD-07	YVD-07-140922	09/22/2014	N	SXI0158	**134**	--	--	**135**	--	--	--	--	--	--	R	MSD	**31.4**	--	--	**10.3**	--	--	1.00	U	--	**12.7**	--	--	--	--	--	**5.52**	--	--
YVD-07	YVD-07-141216	12/16/2014	N	SXL0108	**133**	--	--	**135**	--	--	--	--	--	0.100	U	--	**29.9**	--	--	**8.76**	--	--	1.00	U	--	**12.2**	--	--	--	--	--	**2.92**	--	--
YVD-07	YVD-07-150316	03/16/2015	N	5904541	**140**	--	--	**140**	--	--	--	--	--	0.100	U	--	**37.0**	--	--	**15.0**	--	--	1.00	U	--	**15.0**	--	--	--	--	--	**4.00**	J--	MSD
YVD-07	YVD-D2-150316	03/16/2015	FD	5904541	**140**	--	--	**140**	--	--	--	--	--	0.100	U	--	**35.0**	--	--	**16.0**	--	--	**0.650**	--	--	**14.0**	--	--	--	--	--	**4.20**	J--	MSD
YVD-07	YVD-07-150616	06/16/2015	N	59010751	**150**	--	--	**150**	--	--	--	--	--	0.100	U	--	**34.0**	J+	MSD	**13.0**	--	--	0.500	U	--	**14.0**	J+	MSD	--	--	--	**3.30**	--	--
YVD-07	YVD-D1-150616	06/16/2015	FD	59010751	**140**	--	--	**140**	--	--	--	--	--	0.100	U	--	**35.0**	J+	MSD	**14.0**	--	--	0.500	U	--	**14.0**	J+	MSD	--	--	--	**3.50**	--	--
YVD-07	YVD-07-150923	09/23/2015	N	59020281	**160**	--	--	**160**	--	--	--	--	--	**0.220**	--	--	**33.0**	--	--	**9.90**	--	--	1.00	U	--	**14.0**	--	--	--	--	--	**4.70**	--	--
YVD-07	YVD-07-151214	12/14/2015	N	59025431	**140**	J	FDP	**140**	J	FDP	--	--	--	--	R	MSD	**30.0**	--	--	**6.70**	--	--	1.00	U	--	**13.0**	--	--	--	--	--	**2.40**	--	--
YVD-07	YVD-07-160308	03/08/2016	N	59029711	**140**	--	--	**140**	--	--	--	--	--	**1.10**	J+	FBK, FDP	**25.0**	--	--	**6.70**	--	--	1.00	U	--	**11.0**	--	--	--	--	--	**1.80**	--	--
YVD-07	YVD-07-160621	6/21/2016	N	59037151	**100.0**	--	--	**100.0**	--	--	--	--	--	0.100	U	--	**19.0**	--	--	**6.20**	--	--	1.00	U	--	**9.00**	--	--	--	--	--	**1.20**	--	--
YVD-07	YVD-07-160929	9/29/2016	N	K1611704	**113**	--	--	**113**	--	--	--	--	--	0.050	U	MBK	**17.8**	--	--	**5.30**	--	--	**0.400**	--	--	**7.14**	--	--	--	--	--	**1.37**	--	--
YVD-07	YVD-07-161213	12/13/2016	N	K1615083	**120**	--	--	**120**	--	--	--	--	--	0.050	U	--	**25.9**	--	--	**6.38**	--	--	**0.400**	--	--	**10.2**	--	--	--	--	--	**2.15**	--	--
YVD-07	YVD-030717-07	3/7/2017	N	K1702324	**107**	--	--	**107**	--	--	--	--	--	1.00	U	--	**17.6**	--	--	**5.34**	--	--	**0.430**	--	--	**6.47**	--	--	--	--	--	**1.74**	J	HTQ
YVD-07	YVD-060517-15	6/5/2017	N	K1705754	**105**	--	--	**105**	--	--	--	--	--	0.050	U	--	**19.4**	--	--	**6.07**	--	--	**0.390**	--	--	**7.31**	--	--	--	--	--	**2.07**	--	--
YVD-07	YVD-092617-21	9/26/2017	N	K1710333	**116**	--	--	**116**	--	--	--	--	--	0.050	U	--	**25.4**	--	--	**7.45**	--	--	**0.350**	--	--	**9.27**	--	--	--	--	--	**3.47**	--	--
YVD-07	YVD-120417-11	12/4/2017	N	K1713026	**130**	--	--	**130**	--	--	--	--	--	0.050	U	--	**29.5**	--	--	**8.32**	--	--	**0.370**	--	--	**11.1**	--	--	--	--	--	**4.40**	--	--
YVD-07	YVD-060418-23	6/4/2018	N	874662	**126**	--	--	**126**	--	--	0.470	U	FBK	--	--	--	**34.0**	--	--	**10.5**	--	--	**0.300**	--	--	**13.4**	--	--	--	--	--	**3.34**	--	--
YVD-07	YVD-060319-16	6/3/2019	N	992053	**127**	--	--	**127**	--	--	0.070	U	--	--	--	--	**31.0**	--	--	**5.83**	--	--	**0.170**	--	--	**11.8**	--	--	--	--	--	**1.86**	--	--
YVD-07	YVD-060920-27	6/9/2020	N	009269	**145**	--	--	**145**	--	--	0.070	U	--	--	--	--	**33.8**	--	--	**8.90**	--	--	**0.290**	--	--	**13.7**	--	--	--	--	--	**4.86**	--	--
YVD-07	YVD-060821-34	6/8/2021	N	124212	**142**	--	--	**142**	--	--	0.070	U	--	--	--	--	**33.1**	--	--	**7.68**	--	--	**0.220**	--	--	**13.5**	--	--	--	--	--	**3.34**	--	--
YVD-07	YVD-060622-21	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**4.30**	--	--
YVD-07	YVD-060622-22	6/6/2022	FD	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**4.30**	--	--
YVD-07	YVD-062023-19	6/20/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**4.15**	J	HTQ
YVD-08	YVD-08-130919	09/19/2013	N	SWI0138	**354**	--	--	**355**	--	--	--	--	--	0.100	U	--	**126**	--	--	**145**	--	--	5.00	U	--	**43.8**	--	--	--	--	--	**8.00**	--	--
YVD-08	YVD-08-131211	12/11/2013	N	SWL0063	**259**	--	--	**260**	--	--	--	--	--	--	R	MSD	**134**	--	--	**123**	--	--	5.00	U	--	**53.8**	--	--	--	--	--	**22.5**	--	--
YVD-08	YVD-08-140317	03/17/2014	N	SXC0095	**294**	--	--	**295**	--	--	--	--	--	**0.146**	--	--	**122**	--	--	**128**	--	--	5.00	U	--	**42.0**	--	--	--	--	--	**14.3**	--	--
YVD-08	YVD-08-140602	06/02/2014	N	SXF0017	**279**	--	--	**280**	--	--	--	--	--	0.100	U	--	**138**	--	--	**118**	--	--	2.00	U	--	**64.6**	--	--	--	--	--	**14.7**	--	--
YVD-08	YVD-08-140923	09/23/2014	N	SXI0173	**249**	--	--	**250**	--	--	--	--	--	0.100	U	--	**103**	--	--	**122**	--	--	2.50	U	--	**36.3**	--	--	--	--	--	**8.10**	--	--
YVD-08	YVD-08-141216	12/16/2014	N	SXL0108	**264**	--	--	**265**	--	--	--	--	--	0.100	U	--	**111**	--	--	**126**	--	--	2.50	U	--	**41.4**	--	--	--	--	--	**14.0**	--	--
YVD-08	YVD-08-150317	03/17/2015	N	5904541	**230**	--	--	**230**	--	--	--	--	--	0.100	U	--	**110**	--	--	**120**	--	--	2.50	U	--	**40.0**	--	--	--	--	--	**13.0**	J--	MSD
YVD-08	YVD-D3-150317	03/17/2015	FD	5904541	**240**	--	--	**240**	--	--	--	--	--	0.100	U	--	**100**	--	--	**130**	--	--	0.500	U	--	**39.0**	--	--	--	--	--	**14.0**	J--	MSD
YVD-08	YVD-08-150617	06/17/2015	N	59010961	**280**	J	FDP	**280**	J	FDP	--	--	--	**0.140**	--	--	**110**	--	--	**120**	--	--	2.50	U	--	**40.0**	--	--	--	--	--	**19.0**	--	--
YVD-08	YVD-D3-150617	06/17/2015	FD	59010961	**220**	J	FDP	**220**	J	FDP	--	--	--	0.100	U	--	**110**	--	--	**140**	--	--	5.00	U	--	**39.0**	--	--	--	--	--	**19.0**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-08	YVD-08-150924	09/24/2015	N	59020391	**260**	--	--	**260**	--	--	--	--	--	0.100	UJ	MSD	**110**	--	--	**120**	--	--	2.50	U	--	**44.0**	--	--	--	--	--	**20.0**	J+	MSD
YVD-08	YVD-08-151215	12/15/2015	N	59025501	**260**	--	--	**260**	--	--	--	--	--	--	R	MSD	**120**	--	--	**120**	--	--	2.50	U	--	**44.0**	--	--	--	--	--	**26.0**	--	--
YVD-08	YVD-D3-151215	12/15/2015	FD	59025501	**250**	--	--	**250**	--	--	--	--	--	**0.150**	J--	MSD	**120**	--	--	**110**	--	--	5.00	U	--	**46.0**	--	--	--	--	--	**26.0**	--	--
YVD-08	YVD-08-160310	03/10/2016	N	59029941	**240**	--	--	**240**	--	--	--	--	--	0.100	U	--	**120**	--	--	**120**	--	--	2.50	U	--	**44.0**	--	--	--	--	--	**32.0**	--	--
YVD-08	YVD-08-160622	6/22/2016	N	59037271	**230**	--	--	**230**	--	--	--	--	--	0.100	UJ	MSD	**120**	--	--	**110**	--	--	2.50	U	--	**46.0**	--	--	--	--	--	**34.0**	--	--
YVD-08	YVD-D3-160622	6/22/2016	FD	59037271	**230**	--	--	**230**	--	--	--	--	--	0.100	UJ	FBK, MSD	**120**	--	--	**120**	--	--	0.500	U	--	**46.0**	--	--	--	--	--	**34.0**	--	--
YVD-08	YVD-08-160927	9/27/2016	N	K1611565	**239**	--	--	**239**	--	--	--	--	--	0.050	U	MBK	**120**	--	--	**96.0**	--	--	**0.180**	J	--	**47.0**	--	--	--	--	--	**30.6**	--	--
YVD-08	YVD-08-161213	12/13/2016	N	K1615045	**222**	--	--	**222**	--	--	--	--	--	0.050	U	--	**122**	--	--	**89.3**	--	--	**0.230**	--	--	**41.9**	--	--	--	--	--	**34.5**	J	HTQ
YVD-08	YVD-030917-24	3/9/2017	N	K1702448	**263**	--	--	**263**	--	--	--	--	--	0.050	U	--	**136**	--	--	**95.2**	--	--	**0.200**	J	--	**44.4**	--	--	--	--	--	**37.3**	J	HTQ
YVD-08	YVD-060717-29	6/7/2017	N	K1705833	**236**	--	--	**236**	--	--	--	--	--	0.050	U	--	**139**	--	--	**94.3**	--	--	**0.170**	J	--	**48.3**	--	--	--	--	--	**44.0**	--	--
YVD-08	YVD-092617-19	9/26/2017	N	K1710333	**271**	--	--	**271**	--	--	--	--	--	0.050	U	--	**137**	--	--	**98.0**	--	--	**0.190**	J	--	**44.3**	--	--	--	--	--	**38.6**	J	HTQ
YVD-08	YVD-120517-23	12/5/2017	N	K1713157	**233**	--	--	**233**	--	--	--	--	--	0.050	U	--	**147**	--	--	**98.8**	--	--	**0.200**	J	--	**48.1**	--	--	--	--	--	**49.3**	--	--
YVD-08	YVD-031918-15	3/19/2018	N	870634	**250**	--	--	**250**	--	--	0.070	U	--	--	--	--	**134**	--	--	**103**	--	--	**0.150**	--	--	**46.0**	--	--	--	--	--	**46.3**	--	--
YVD-08	YVD-060518-31	6/5/2018	N	874860	**238**	--	--	**238**	--	--	0.070	U	--	--	--	--	**136**	--	--	**99.0**	--	--	**0.160**	--	--	**47.5**	--	--	--	--	--	**53.0**	--	--
YVD-08	YVD-090918-04	9/9/2018	N	880601	**237**	--	--	**237**	--	--	0.070	U	--	--	--	--	**146**	--	--	**103**	--	--	**0.180**	--	--	**49.2**	--	--	--	--	--	**54.4**	--	--
YVD-08	YVD-121118-19	12/11/2018	N	884939	**227**	--	--	**227**	--	--	0.070	U	--	--	--	--	**138**	--	--	**117**	--	--	**0.160**	--	--	**45.9**	--	--	--	--	--	**59.4**	--	--
YVD-08	YVD-031719-03	3/17/2019	N	988239	**234**	--	--	**234**	--	--	0.070	U	--	--	--	--	**138**	--	--	**119**	--	--	0.220	U	FBK	**46.3**	--	--	--	--	--	**54.8**	--	--
YVD-08	YVD-060319-21	6/3/2019	N	992053	**240**	--	--	**240**	--	--	0.070	U	--	--	--	--	**138**	--	--	**100**	--	--	**0.100**	--	--	**46.1**	--	--	--	--	--	**50.0**	--	--
YVD-08	YVD-090919-02	9/9/2019	N	998357	**226**	--	--	**226**	--	--	0.070	U	--	--	--	--	**139**	--	--	**89.8**	--	--	**0.150**	--	--	**45.7**	--	--	--	--	--	**62.0**	--	--
YVD-08	YVD-120919-02	12/9/2019	N	902276	**227**	--	--	**227**	--	--	0.070	U	--	--	--	--	**132**	--	--	**95.6**	--	--	**0.160**	--	--	**44.6**	--	--	--	--	--	**61.8**	--	--
YVD-08	YVD-120919-04	12/9/2019	FD	902276	**226**	--	--	**226**	--	--	0.070	U	--	--	--	--	**130**	--	--	**94.3**	--	--	**0.150**	--	--	**44.5**	--	--	--	--	--	**61.6**	--	--
YVD-08	YVD-033120-17	3/31/2020	N	006260	**213**	--	--	**213**	--	--	0.070	U	--	--	--	--	**132**	--	--	**96.5**	--	--	**0.180**	--	--	**45.7**	--	--	--	--	--	**68.0**	--	--
YVD-08	YVD-060920-23	6/9/2020	N	009269	**217**	--	--	**217**	--	--	0.070	U	--	--	--	--	**132**	--	--	**96.1**	--	--	**0.190**	--	--	**44.8**	--	--	--	--	--	**66.6**	--	--
YVD-08	YVD-092120-11	9/21/2020	N	013896	**216**	--	--	**216**	--	--	0.070	U	--	--	--	--	**134**	--	--	**96.2**	--	--	**0.160**	--	--	**45.8**	--	--	--	--	--	**66.0**	--	--
YVD-08	YVD-120720-11	12/7/2020	N	017035	**215**	--	--	**215**	--	--	0.070	U	--	--	--	--	**132**	--	--	**107**	--	--	**0.200**	--	--	**45.9**	--	--	--	--	--	**62.2**	--	--
YVD-08	YVD-030121-07	3/1/2021	N	119931	**217**	--	--	**217**	--	--	0.070	U	--	--	--	--	**135**	--	--	**92.9**	--	--	**0.200**	--	--	**45.8**	--	--	--	--	--	**68.8**	--	--
YVD-08	YVD-060821-28	6/8/2021	N	124212	**218**	--	--	**218**	--	--	0.070	U	--	--	--	--	**130**	--	--	**94.2**	--	--	**0.170**	--	--	**44.9**	--	--	--	--	--	**62.0**	--	--
YVD-08	YVD-121521-20	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**60.8**	J	HTQ, MS
YVD-08	YVD-031522-12	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**68.1**	--	--
YVD-08	YVD-060722-27	6/7/2022	N	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**69.1**	J	HTQ
YVD-08	YVD-091322-05	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**64.8**	--	--
YVD-08	YVD-122722-19	12/27/2022	N	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**71.5**	--	--
YVD-08	YVD-030623-13	3/6/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**47.8**	--	--	--	--	--
YVD-08	YVD-062123-28	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**54.3**	J	HTQ
YVD-09	YVD-09-130919	09/19/2013	N	SWI0138	**369**	--	--	**370**	--	--	--	--	--	0.100	U	--	**107**	--	--	**96.3**	--	--	5.00	U	--	**39.3**	--	--	--	--	--	**74.7**	--	--
YVD-09	YVD-09-131212	12/12/2013	N	SWL0078	**384**	--	--	**385**	--	--	--	--	--	0.020	U	--	**109**	--	--	**87.2**	--	--	5.00	U	--	**42.0**	--	--	--	--	--	**64.4**	--	--
YVD-09	YVD-09-140319	03/19/2014	N	SXC0107	**388**	--	--	**390**	--	--	--	--	--	0.100	U	--	**109**	--	--	**104**	--	--	**5.50**		--	**40.8**	--	--	--	--	--	**62.4**	--	--
YVD-09	YVD-09-140603	06/03/2014	N	SXF0025	**367**	--	--	**368**	--	--	--	--	--	0.100	U	--	**113**	--	--	**89.8**	--	--	5.00	U	--	**44.5**	--	--	--	--	--	**57.1**	--	--
YVD-09	YVD-09-140924	09/24/2014	N	SXI0173	**359**	--	--	**360**	--	--	--	--	--	0.100	U	--	**118**	--	--	**68.2**	--	--	5.00	U	--	**41.7**	--	--	--	--	--	**48.0**	--	--
YVD-09	YVD-09-141217	12/17/2014	N	SXL0121	**359**	--	--	**360**	--	--	--	--	--	0.100	U	--	**130**	--	--	**85.0**	--	--	5.00	U	--	**56.3**	--	--	--	--	--	**53.9**	--	--
YVD-09	YVD-09-150318	03/18/2015	N	5904651	**350**	--	--	**350**	--	--	--	--	--	**0.140**	--	--	**110**	--	--	**74.0**	--	--	5.00	U	--	**46.0**	--	--	--	--	--	**47.0**	--	--
YVD-09	YVD-09-150617	06/17/2015	N	59010961	**350**	--	--	**350**	--	--	--	--	--	**0.140**	--	--	**110**	--	--	**89.0**	--	--	5.00	U	--	**43.0**	--	--	--	--	--	**54.0**	--	--
YVD-09	YVD-09-150923	09/23/2015	N	59020391	**330**	--	--	**330**	--	--	--	--	--	**0.210**	J	MSD	**110**	--	--	**78.0**	--	--	0.500	U	--	**46.0**	--	--	--	--	--	**56.0**	J+	MSD
YVD-09	YVD-09-151215	12/15/2015	N	59025501	**340**	--	--	**340**	--	--	--	--	--	--	R	MSD	**110**	--	--	**77.0**	--	--	5.00	U	--	**42.0**	--	--	--	--	--	**52.0**	--	--
YVD-09	YVD-09-160310	03/10/2016	N	59029941	**360**	--	--	**360**	--	--	--	--	--	**0.120**	--	--	**110**	--	--	**72.0**	--	--	5.00	U	--	**42.0**	--	--	--	--	--	**48.0**	--	--
YVD-09	YVD-09-160622	6/22/2016	N	59037271	**350**	--	--	**350**	--	--	--	--	--	0.100	UJ	MSD	**100**	--	--	**76.0**	--	--	5.00	U	--	**42.0**	--	--	--	--	--	**49.0**	--	--
YVD-09	YVD-09-160929	9/29/2016	N	K1611704	**347**	--	--	**347**	--	--	--	--	--	0.050	U	MBK	**103**	--	--	**66.7**	--	--	**0.340**	--	--	**41.2**	--	--	--	--	--	**43.2**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-09	YVD-09-161213	12/13/2016	N	K1615045	**340**	--	--	**340**	--	--	--	--	--	0.050	U	--	**107**	--	--	**59.8**	--	--	**0.400**	--	--	**38.1**	--	--	--	--	--	**42.8**	J	HTQ
YVD-09	YVD-D2-161213	12/13/2016	FD	K1615045	**340**	--	--	**340**	--	--	--	--	--	0.050	U	--	**108**	--	--	**61.4**	--	--	**0.400**	--	--	**37.1**	--	--	--	--	--	**43.3**	J	HTQ
YVD-09	YVD-031317-35	3/13/2017	N	K1702489	**329**	--	--	**329**	--	--	--	--	--	0.050	U	--	**108**	--	--	**63.9**	--	--	**0.370**	--	--	**39.2**	--	--	--	--	--	**44.3**	--	--
YVD-09	YVD-060517-08	6/5/2017	N	K1705702	**341**	--	--	**341**	--	--	--	--	--	0.050	U	--	**110**	--	--	**62.6**	--	--	**0.390**	--	--	**39.4**	--	--	--	--	--	**44.6**	--	--
YVD-09	YVD-092617-29	9/26/2017	N	K1710381	**351**	--	--	**351**	--	--	--	--	--	0.050	U	--	**109**	--	--	**61.0**	--	--	**0.380**	--	--	**37.2**	--	--	--	--	--	**44.1**	J	HTQ
YVD-09	YVD-092617-30	9/26/2017	FD	K1710381	**415**	--	--	**415**	--	--	--	--	--	0.050	U	--	**109**	--	--	**61.1**	--	--	**0.380**	--	--	**37.4**	--	--	--	--	--	**44.1**	J	HTQ
YVD-09	YVD-120517-21	12/5/2017	N	K1713091	**351**	--	--	**351**	--	--	--	--	--	0.050	U	--	**108**	--	--	**63.0**	--	--	**0.380**	--	--	**35.9**	--	--	--	--	--	**46.9**	--	--
YVD-09	YVD-031918-18	3/19/2018	N	870634	**350**	--	--	**350**	--	--	0.070	U	--	--	--	--	**108**	--	--	**69.2**	--	--	**0.340**	--	--	**35.9**	--	--	--	--	--	**48.5**	--	--
YVD-09	YVD-060318-13	6/3/2018	N	874568	**348**	--	--	**348**	--	--	0.070	U	--	--	--	--	**107**	--	--	**63.4**	--	--	**0.360**	--	--	**37.8**	--	--	--	--	--	**50.6**	--	--
YVD-09	YVD-090918-06	9/9/2018	N	880601	**354**	--	--	**354**	--	--	0.070	U	--	--	--	--	**108**	--	--	**71.0**	--	--	**0.350**	--	--	**35.9**	--	--	--	--	--	**51.4**	--	--
YVD-09	YVD-121118-15	12/11/2018	N	884939	**358**	--	--	**358**	--	--	0.070	U	--	--	--	--	**102**	--	--	**65.6**	--	--	**0.340**	--	--	**34.3**	--	--	--	--	--	**52.8**	--	--
YVD-09	YVD-121118-17	12/11/2018	FD	884939	**357**	--	--	**357**	--	--	0.070	U	--	--	--	--	**103**	--	--	**68.0**	--	--	**0.330**	--	--	**34.6**	--	--	--	--	--	**54.6**	--	--
YVD-09	YVD-031719-05	3/17/2019	N	988239	**356**	--	--	**356**	--	--	0.070	U	--	--	--	--	**104**	--	--	**67.4**	--	--	0.310	U	FBK	**35.8**	--	--	--	--	--	**56.0**	--	--
YVD-09	YVD-060319-15	6/3/2019	N	992053	**353**	--	--	**353**	--	--	0.070	U	--	--	--	--	**104**	--	--	**43.4**	--	--	**0.360**	--	--	**35.7**	--	--	--	--	--	**53.3**	--	--
YVD-09	YVD-090919-04	9/9/2019	N	998357	**363**	--	--	**363**	--	--	0.070	U	--	--	--	--	**110**	--	--	**64.7**	--	--	**0.330**	--	--	**36.5**	--	--	--	--	--	**58.2**	--	--
YVD-09	YVD-120919-06	12/9/2019	N	902276	**356**	--	--	**356**	--	--	0.070	U	--	--	--	--	**106**	--	--	**69.1**	--	--	**0.370**	--	--	**35.8**	--	--	--	--	--	**57.0**	--	--
YVD-09	YVD-033020-05	3/30/2020	N	006241	**350**	--	--	**350**	--	--	0.070	U	--	--	--	--	**102**	--	--	**71.4**	--	--	**0.370**	--	--	**35.2**	--	--	--	--	--	**55.2**	--	--
YVD-09	YVD-060920-24	6/9/2020	N	009269	**350**	--	--	**350**	--	--	0.070	U	--	--	--	--	**102**	--	--	**68.8**	--	--	**0.310**	--	--	**35.4**	--	--	--	--	--	**55.2**	--	--
YVD-09	YVD-092120-16	9/21/2020	N	013896	**347**	--	--	**347**	--	--	0.070	U	--	--	--	--	**101**	--	--	**72.5**	--	--	0.100	U	--	**35.1**	--	--	--	--	--	**56.2**	--	--
YVD-09	YVD-120720-13	12/7/2020	N	017035	**345**	--	--	**345**	--	--	0.070	U	--	--	--	--	**101**	--	--	**69.4**	--	--	**0.260**	--	--	**35.7**	--	--	--	--	--	**54.0**	--	--
YVD-09	YVD-030121-05	3/1/2021	N	119931	**347**	--	--	**347**	--	--	0.070	U	--	--	--	--	**104**	--	--	**68.8**	--	--	**0.350**	--	--	**36.3**	--	--	--	--	--	**57.4**	--	--
YVD-09	YVD-060721-18	6/7/2021	N	124105	**352**	--	--	**352**	--	--	0.070	U	--	--	--	--	**102**	--	--	**75.9**	--	--	**0.320**	--	--	**35.5**	--	--	--	--	--	**54.4**	--	--
YVD-09	YVD-121421-09	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**55.3**	J	HTQ, MS
YVD-09	YVD-031522-14	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**60.8**	--	--
YVD-09	YVD-060622-12	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**60.7**	--	--
YVD-09	YVD-091322-07	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**59.8**	--	--
YVD-09	YVD-120822-15	12/8/2022	N	K2214578	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**61.8**	--	--
YVD-09	YVD-030623-19	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**65.0**	--	--	--	--
YVD-09	YVD-062123-30	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**63.6**	J	HTQ
YVD-10	YVD-10-130917	09/17/2013	N	SWI0123	**464**	--	--	**465**	--	--	--	--	--	0.100	U	--	**216**	--	--	**95.4**	--	--	5.00	U	--	**51.8**	--	--	--	--	--	**95.0**		--
YVD-10	YVD-10-131212	12/12/2013	N	SWL0078	**459**	--	--	**460**	--	--	--	--	--	0.020	U	--	**202**	--	--	**91.4**	--	--	5.00	U	--	**55.6**	--	--	--	--	--	**86.9**	--	--
YVD-10	YVD-10-140319	03/19/2014	N	SXC0107	**489**	--	--	**490**	--	--	--	--	--	**0.109**	--	--	**218**	--	--	**86.8**	--	--	5.00	U	--	**54.0**	--	--	--	--	--	**77.6**	--	--
YVD-10	YVD-10-140603	06/03/2014	N	SXF0025	**487**	--	--	**488**	--	--	--	--	--	**0.105**	--	--	**232**	--	--	**94.3**	--	--	5.00	U	--	**58.6**	--	--	--	--	--	**86.1**	--	--
YVD-10	YVD-10-140924	09/24/2014	N	SXI0173	**523**	--	--	**525**	--	--	--	--	--	0.100	U	--	**276**	--	--	**115**	--	--	5.00	U	--	**65.8**	--	--	--	--	--	**97.2**	--	--
YVD-10	YVD-10-141217	12/17/2014	N	SXL0144	**503**	--	--	**505**	--	--	--	--	--	0.500	U	--	**248**	--	--	**97.9**	--	--	5.00	U	--	**60.4**	--	--	--	--	--	**78.7**	--	--
YVD-10	YVD-10-150318	03/18/2015	N	5904651	**590**	--	--	**590**	--	--	--	--	--	0.100	U	--	**400**	--	--	**180**	--	--	5.00	U	--	**92.0**	--	--	--	--	--	**120**	--	--
YVD-10	YVD-10-150617	06/17/2015	N	59010961	**600**	--	--	**600**	--	--	--	--	--	**0.120**	--	--	**390**	--	--	**39.0**	--	--	5.00	U	--	**95.0**	--	--	--	--	--	**20.0**	--	--
YVD-10	YVD-10-150923	09/23/2015	N	59020391	**620**	--	--	**620**	--	--	--	--	--	**0.720**	J	MSD	**330**	--	--	**160**	--	--	5.00	U	--	**89.0**	--	--	--	--	--	**120**	J+	MSD
YVD-10	YVD-10-151214	12/14/2015	N	59025351	**600**	--	--	**600**	--	--	--	--	--	--	R	MSD	**350**	--	--	**150**	--	--	5.00	U	--	**84.0**	--	--	--	--	--	**120**	--	--
YVD-10	YVD-10-160309	03/09/2016	N	59029711	**520**	--	--	**520**	--	--	--	--	--	0.100	UJ	FDP	**310**	--	--	**140**	--	--	5.00	U	--	**73.0**	--	--	--	--	--	**98.0**	--	--
YVD-10	YVD-10-160621	6/21/2016	N	59037271	**510**	--	--	**510**	--	--	--	--	--	**0.110**	J--	MSD	**270**	--	--	**120**	--	--	5.00	U	--	**73.0**	--	--	--	--	--	**96.0**	--	--
YVD-10	YVD-10-160929	9/29/2016	N	K1611698	**513**	--	--	**513**	--	--	--	--	--	0.050	U	MBK	**286**	--	--	**105**	--	--	0.200	U	MBK	**63.1**	--	--	--	--	--	**84.0**	--	--
YVD-10	YVD-10-161212	12/12/2016	N	K1615029	**524**	--	--	**524**	--	--	--	--	--	0.050	U	--	**303**	--	--	**141**	--	--	**0.100**	J	--	**66.9**	--	--	--	--	--	**109**	J	HTQ
YVD-10	YVD-030917-27	3/9/2017	N	K1702448	**637**	--	--	**637**	--	--	--	--	--	0.050	U	--	**569**	--	--	**173**	--	--	**0.090**	J	--	**128**	--	--	--	--	--	**123**	J	HTQ
YVD-10	YVD-060617-22	6/6/2017	N	K1705754	**525**	--	--	**525**	--	--	--	--	--	0.050	U	--	**349**	--	--	**125**	--	--	**0.140**	J	--	**76.7**	--	--	--	--	--	**99.4**	--	--
YVD-10	YVD-092617-31	9/26/2017	N	K1710381	**523**	--	--	**523**	--	--	--	--	--	0.050	U	--	**316**	--	--	**113**	--	--	**0.090**	J	--	**66.7**	--	--	--	--	--	**93.9**	J	HTQ
YVD-10	YVD-120517-30	12/5/2017	N	K1713091	**540**	--	--	**540**	--	--	--	--	--	0.050	U	--	**327**	--	--	**128**	--	--	**0.110**	J	--	**67.3**	--	--	--	--	--	**109**	J	HTQ
YVD-10	YVD-031818-06	3/18/2018	N	870610	**527**	--	--	**527**	--	--	0.070	U	--	--	--	--	**296**	--	--	**121**	--	--	0.100	U	--	**61.0**	--	--	--	--	--	**91.4**	--	--
YVD-10	YVD-060318-06	6/3/2018	N	874568	**543**	--	--	**543**	--	--	0.080	U	FBK	--	--	--	**298**	--	--	**122**	--	--	0.100	U	--	**65.0**	--	--	--	--	--	**92.0**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-10	YVD-090918-13	9/9/2018	N	880601	**557**	--	--	**557**	--	--	0.070	U	--	--	--	--	**308**	--	--	**128**	--	--	**0.100**	--	--	**63.5**	--	--	--	--	--	**90.0**	--	--
YVD-10	YVD-121018-08	12/10/2018	N	884857	**544**	--	--	**544**	--	--	0.070	U	--	--	--	--	**274**	--	--	**124**	--	--	0.100	U	FBK	**58.0**	J	MSD	--	--	--	**87.0**	--	--
YVD-10	YVD-031819-16	3/18/2019	N	988273	**527**	--	--	**527**	--	--	0.070	U	--	--	--	--	**276**	--	--	**141**	--	--	**0.100**	--	--	**58.0**	--	--	--	--	--	**81.6**	--	--
YVD-10	YVD-060319-18	6/3/2019	N	992053	**568**	--	--	**568**	--	--	0.070	U	--	--	--	--	**297**	--	--	**135**	--	--	0.100	U	--	**63.0**	--	--	--	--	--	**74.4**	--	--
YVD-10	YVD-091019-20	9/10/2019	N	998438	**584**	--	--	**584**	--	--	0.070	U	--	--	--	--	**256**	--	--	**92.0**	--	--	0.100	U	--	**54.5**	--	--	--	--	--	**69.0**	--	--
YVD-10	YVD-121019-21	12/10/2019	N	902321	**576**	--	--	**576**	--	--	0.070	U	--	--	--	--	**286**	--	--	**114**	--	--	0.100	U	--	**59.5**	--	--	--	--	--	**84.4**	--	--
YVD-10	YVD-033020-08	3/30/2020	N	006241	**568**	--	--	**568**	--	--	0.070	U	--	--	--	--	**264**	--	--	**104**	--	--	0.100	U	--	**57.0**	--	--	--	--	--	**73.2**	--	--
YVD-10	YVD-060920-12	6/9/2020	N	009269	**586**	--	--	**586**	--	--	0.070	U	--	--	--	--	**293**	--	--	**128**	--	--	0.100	U	--	**62.0**	--	--	--	--	--	**82.6**	--	--
YVD-10	YVD-092020-08	9/20/2020	N	013864	**596**	--	--	**596**	--	--	0.070	U	--	--	--	--	**306**	--	--	**110**	--	--	0.100	U	--	**63.5**	--	--	--	--	--	**76.0**	--	--
YVD-10	YVD-120720-12	12/7/2020	N	017035	**612**	--	--	**612**	--	--	0.070	U	--	--	--	--	**331**	--	--	**161**	--	--	0.100	U	--	**71.0**	--	--	--	--	--	**76.0**	--	--
YVD-10	YVD-030121-12	3/1/2021	N	119931	**770**	--	--	**770**	--	--	0.070	U	--	--	--	--	**482**	--	--	**90.0**	--	--	0.100	U	--	**97.0**	--	--	--	--	--	**44.4**	--	--
YVD-10	YVD-060621-07	6/6/2021	N	124053	**710**	--	--	**710**	--	--	0.070	U	--	--	--	--	**320**	--	--	**85.3**	--	--	**0.490**	--	--	**68.0**	--	--	--	--	--	**53.1**	--	--
YVD-10	YVD-121421-06	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**75.8**	--	--
YVD-10	YVD-031422-06	3/14/2022	N	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**17.7**	--	--
YVD-10	YVD-060522-06	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**55.3**	--	--
YVD-10	YVD-091422-20	9/14/2022	N	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**55.9**	--	--
YVD-10	YVD-120722-11	12/7/2022	N	K2214479	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**68.8**	--	--
YVD-10	YVD-030623-10	3/6/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**60.1**	--	--	--	--	--
YVD-10	YVD-062123-26	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**66.1**	J	HTQ
YVD-11	YVD-11-130923	09/23/2013	N	SWI0178	**254**	J	FDP	**255**	J	FDP	--	--	--	0.100	U	--	**183**	--	--	--	--	--	--	--	--	**51.9**	--	--	--	--	--	--	--	--
YVD-11	YVD-D2-130923	09/23/2013	FD	SWI0178	**199**	J	FDP	**200**	J	FDP	--	--	--	0.100	U	--	**175**	--	--	--	--	--	--	--	--	**46.0**	--	--	--	--	--	--	--	--
YVD-11	YVD-11-130926	09/26/2013	N	SWI0190	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**54.7**	--	--	5.00	U	--	--	--	--	--	--	--	**38.4**	--	--
YVD-11	YVD-D3-130926	09/26/2013	FD	SWI0190	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**61.4**	--	--	5.00	U	--	--	--	--	--	--	--	**46.2**	--	--
YVD-11	YVD-11-131212	12/12/2013	N	SWL0073	**294**	--	--	**295**	--	--	--	--	--	0.020	UJ	MSD	**171**	--	--	**58.7**	--	--	5.00	U	--	**43.4**	--	--	--	--	--	**49.9**	--	--
YVD-11	YVD-11-140318	03/18/2014	N	SXC0107	**324**	--	--	**325**	--	--	--	--	--	0.100	U	--	**183**	--	--	**61.6**	--	--	5.00	U	--	**44.4**	--	--	--	--	--	**43.7**	--	--
YVD-11	YVD-11-140603	06/03/2014	N	SXF0017	**312**	--	--	**313**	--	--	--	--	--	0.100	U	--	**176**	--	--	**67.2**	--	--	5.00	U	--	**50.3**	--	--	--	--	--	**49.1**	--	--
YVD-11	YVD-11-140924	09/24/2014	N	SXI0173	**294**	--	--	**295**	--	--	--	--	--	0.100	U	--	**193**	--	--	**67.2**	--	--	2.50	U	--	**47.9**	--	--	--	--	--	**46.6**	--	--
YVD-11	YVD-11-141217	12/17/2014	N	SXL0121	**289**	--	--	**290**	--	--	--	--	--	0.100	U	--	**198**	--	--	**72.1**	--	--	5.00	U	--	**53.6**	--	--	--	--	--	**49.1**	--	--
YVD-11	YVD-11-150317	03/17/2015	N	5904651	**290**	--	--	**290**	--	--	--	--	--	0.100	U	--	**190**	--	--	**76.0**	--	--	5.00	U	--	**51.0**	--	--	--	--	--	**52.0**	--	--
YVD-11	YVD-11-150616	06/16/2015	N	59010961	**290**	--	--	**290**	--	--	--	--	--	0.100	U	--	**200**	--	--	**86.0**	--	--	5.00	U	--	**50.0**	--	--	--	--	--	**56.0**	--	--
YVD-11	YVD-11-150923	09/23/2015	N	59020281	**310**	--	--	**310**	--	--	--	--	--	**0.120**	--	--	**200**	--	--	**90.0**	--	--	5.00	U	--	**55.0**	--	--	--	--	--	**66.0**	--	--
YVD-11	YVD-11-151215	12/15/2015	N	59025431	**110**	J	FDP	**110**	J	FDP	--	--	--	--	R	MSD	**210**	--	--	**100**	--	--	5.00	U	--	**60.0**	--	--	--	--	--	**74.0**	--	--
YVD-11	YVD-D2-151215	12/15/2015	FD	59025431	**360**	J	FDP	**360**	J	FDP	--	--	--	--	R	MSD	**210**	--	--	**98.0**	--	--	0.500	U	--	**58.0**	--	--	--	--	--	**70.0**	--	--
YVD-11	YVD-11-160309	03/09/2016	N	59029711	**340**	--	--	**340**	--	--	--	--	--	**0.140**	J	FDP	**200**	--	--	**99.0**	--	--	5.00	U	--	**53.0**	--	--	--	--	--	**65.0**	--	--
YVD-11	YVD-11-160621	6/21/2016	N	59037151	**340**	--	--	**340**	--	--	--	--	--	0.100	U	--	**200**	--	--	**120**	--	--	5.00	U	--	**56.0**	--	--	--	--	--	**71.0**	--	--
YVD-11	YVD-11-160927	9/27/2016	N	K1611629	**375**	--	--	**375**	--	--	--	--	--	0.050	U	MBK	**204**	--	--	**82.0**	--	--	**0.180**	J	--	**52.6**	--	--	--	--	--	**48.9**	J	HTQ
YVD-11	YVD-11-161214	12/14/2016	N	K1615126	**352**	--	--	**352**	--	--	--	--	--	0.050	U	--	**209**	--	--	**82.5**	--	--	**0.190**	J	--	**57.8**	--	--	--	--	--	**55.5**	--	--
YVD-11	YVD-031317-37	3/13/2017	N	K1702489	**353**	--	--	**353**	--	--	--	--	--	0.050	U	--	**235**	--	--	**102**	--	--	**0.210**	--	--	**62.1**	--	--	--	--	--	**77.3**	--	--
YVD-11	YVD-060517-10	6/5/2017	N	K1705702	**341**	--	--	**341**	--	--	--	--	--	0.050	U	--	**271**	--	--	**129**	--	--	**0.180**	J	--	**69.1**	--	--	--	--	--	**97.1**	--	--
YVD-11	YVD-092617-26	9/26/2017	N	K1710381	**347**	--	--	**347**	--	--	--	--	--	0.050	U	--	**276**	--	--	**135**	--	--	**0.170**	J	--	**68.6**	--	--	--	--	--	**103**	J	HTQ
YVD-11	YVD-120417-06	12/4/2017	N	K1713026	**361**	--	--	**361**	--	--	--	--	--	0.050	U	--	**248**	--	--	**110**	--	--	**0.160**	J	--	**58.6**	--	--	--	--	--	**84.8**	--	--
YVD-11	YVD-031918-12	3/19/2018	N	870634	**386**	--	--	**386**	--	--	0.070	U	--	--	--	--	**223**	--	--	**91.4**	--	--	**0.110**	--	--	**51.5**	--	--	--	--	--	**61.8**	--	--
YVD-11	YVD-031918-14	3/19/2018	FD	870634	**387**	--	--	**387**	--	--	0.070	U	--	--	--	--	**222**	--	--	**89.1**	--	--	**0.120**	--	--	**50.5**	--	--	--	--	--	**61.2**	--	--
YVD-11	YVD-060418-14	6/4/2018	N	874662	**377**	--	--	**377**	--	--	0.340	U	FBK	--	--	--	**224**	--	--	**114**	--	--	**0.120**	--	--	**57.0**	--	--	--	--	--	**68.6**	--	--
YVD-11	YVD-060418-16	6/4/2018	FD	874662	**380**	--	--	**380**	--	--	0.080	U	FBK	--	--	--	**231**	--	--	**114**	--	--	**0.120**	--	--	**57.5**	--	--	--	--	--	**68.2**	--	--
YVD-11	YVD-090918-05	9/9/2018	N	880601	**395**	--	--	**395**	--	--	0.070	U	--	--	--	--	**223**	--	--	**102**	--	--	**0.200**	--	--	**53.0**	--	--	--	--	--	**62.8**	--	--
YVD-11	YVD-121018-10	12/10/2018	N	884857	**410**	--	--	**410**	--	--	0.070	U	--	--	--	--	**182**	--	--	**75.6**	--	--	0.140	U	FBK	**44.9**	J	MSD	--	--	--	**41.1**	--	--
YVD-11	YVD-031819-18	3/18/2019	N	988273	**440**	--	--	**440**	--	--	0.070	U	--	--	--	--	**158**	--	--	**38.6**	--	--	**0.120**	--	--	**38.9**	--	--	--	--	--	**20.2**	--	--
YVD-11	YVD-060219-02	6/2/2019	N	991939	**424**	--	--	**424**	--	--	0.070	U	--	--	--	--	**156**	--	--	49.2	U	FBK	0.590	U	FBK	**38.3**	--	--	--	--	--	**26.4**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-11	YVD-060219-04	6/2/2019	FD	991939	**423**	--	--	**423**	--	--	0.070	U	--	--	--	--	**156**	--	--	49.8	U	FBK	0.600	U	FBK	**38.7**	--	--	--	--	--	**26.7**	--	--
YVD-11	YVD-090919-05	9/9/2019	N	998357	**423**	--	--	**423**	--	--	0.070	U	--	--	--	--	**164**	--	--	**52.2**	--	--	**0.120**	--	--	**40.0**	--	--	--	--	--	**32.8**	--	--
YVD-11	YVD-120919-13	12/9/2019	N	902276	**429**	--	--	**429**	--	--	0.070	U	--	--	--	--	**162**	--	--	**46.1**	--	--	**0.110**	--	--	**39.7**	--	--	--	--	--	**27.8**	--	--
YVD-11	YVD-033020-10	3/30/2020	N	006241	**426**	--	--	**426**	--	--	0.070	U	--	--	--	--	**150**	--	--	**39.6**	--	--	**0.130**	--	--	**36.6**	--	--	--	--	--	**23.8**	--	--
YVD-11	YVD-061020-31	6/10/2020	N	009361	**420**	--	--	**420**	--	--	0.070	U	--	--	--	--	**151**	--	--	**47.0**	--	--	**0.130**	--	--	**36.6**	J	MS	--	--	--	**24.9**	--	--
YVD-11	YVD-092120-20	9/21/2020	N	013896	**413**	--	--	**413**	--	--	0.070	U	--	--	--	--	**162**	--	--	**69.2**	--	--	**0.120**	--	--	**40.9**	--	--	--	--	--	**37.5**	--	--
YVD-11	YVD-120720-10	12/7/2020	N	017035	**412**	--	--	**412**	--	--	0.070	U	--	--	--	--	**179**	--	--	**78.2**	--	--	**0.240**	--	--	**44.4**	--	--	--	--	--	**48.0**	--	--
YVD-11	YVD-030121-06	3/1/2021	N	119931	**422**	--	--	**422**	--	--	0.070	U	--	--	--	--	**178**	--	--	**85.9**	--	--	**0.170**	--	--	**45.6**	--	--	--	--	--	**44.1**	--	--
YVD-11	YVD-060821-23	6/8/2021	N	124212	**414**	--	--	**414**	--	--	0.070	U	--	--	--	--	**170**	--	--	**85.4**	--	--	**0.110**	--	--	**41.9**	--	--	--	--	--	**41.7**	--	--
YVD-11	YVD-121421-05	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**46.1**	--	--
YVD-11	YVD-031522-19	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**44.6**	--	--
YVD-11	YVD-060622-18	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**82.7**	--	--
YVD-11	YVD-091422-21	9/14/2022	N	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**57.1**	--	--
YVD-11	YVD-120622-06	12/6/2022	N	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**62.5**	--	--
YVD-11	YVD-030623-21	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**58.7**	--	--	--
YVD-11	YVD-062123-24	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**80.8**	J	HTQ
YVD-12	YVD-12-130919	09/19/2013	N	SWI0142	**204**	--	--	**205**	--	--	--	--	--	0.100	U	--	**98.6**	--	--	**98.2**	--	--	5.00	U	--	**37.5**	--	--	--	--	--	--	--	--
YVD-12	YVD-12-130925	09/25/2013	N	SWI0175	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**15.0**	--	--
YVD-12	YVD-12-131211	12/11/2013	N	SWL0073	**194**	--	--	**195**	--	--	--	--	--	0.020	UJ	MSD	**93.5**	--	--	**97.0**	--	--	5.00	U	--	**36.2**	--	--	--	--	--	**20.1**	--	--
YVD-12	YVD-12-140318	03/18/2014	N	SXC0095	**204**	--	--	**205**	--	--	--	--	--	**0.248**	--	--	**92.9**	--	--	**95.2**	--	--	5.00	U	--	**35.9**	--	--	--	--	--	**17.0**	--	--
YVD-12	YVD-12-140603	06/03/2014	N	SXF0017	**199**	--	--	**200**	--	--	--	--	--	0.100	U	--	**92.6**	--	--	**8.33**	--	--	0.500	U	--	**34.9**	--	--	--	--	--	**1.44**	--	--
YVD-12	YVD-12-140922	09/22/2014	N	SXI0148	**189**	--	--	**190**	--	--	--	--	--	0.100	U	--	**98.4**	--	--	**78.5**	--	--	5.00	U	--	**39.1**	--	--	--	--	--	**13.3**	--	--
YVD-12	YVD-D2-140922	09/22/2014	FD	SXI0148	**194**	--	--	**195**	--	--	--	--	--	0.100	U	--	**99.3**	--	--	**82.4**	--	--	2.00	U	--	**39.0**	--	--	--	--	--	**15.5**	--	--
YVD-12	YVD-12-141216	12/16/2014	N	SXL0121	**194**	--	--	**195**	--	--	--	--	--	0.100	U	--	**99.3**	--	--	**84.1**	--	--	5.00	U	--	**39.6**	--	--	--	--	--	**15.1**	--	--
YVD-12	YVD-12-150317	03/17/2015	N	5904541	**190**	--	--	**190**	--	--	--	--	--	0.100	U	--	**93.0**	--	--	**75.0**	--	--	5.00	U	--	**37.0**	--	--	--	--	--	**14.0**	J--	MSD
YVD-12	YVD-12-150617	06/17/2015	N	59010961	**190**	--	--	**190**	--	--	--	--	--	0.100	U	--	**90.0**	--	--	**84.0**	--	--	5.00	U	--	**35.0**	--	--	--	--	--	**12.0**	--	--
YVD-12	YVD-12-150924	09/24/2015	N	59020391	**190**	--	--	**190**	--	--	--	--	--	0.100	UJ	MSD	**92.0**	--	--	**78.0**	--	--	5.00	U	--	**39.0**	--	--	--	--	--	**15.0**	J+	MSD
YVD-12	YVD-12-151216	12/16/2015	N	59025501	**210**	--	--	**210**	--	--	--	--	--	--	R	MSD	**95.0**	--	--	**76.0**	--	--	5.00	U	--	**37.0**	--	--	--	--	--	**14.0**	--	--
YVD-12	YVD-12-160309	03/09/2016	N	59029941	**210**	--	--	**210**	--	--	--	--	--	0.100	U	--	**95.0**	--	--	**73.0**	--	--	5.00	U	--	**35.0**	--	--	--	--	--	**13.0**	--	--
YVD-12	YVD-D3-160309	03/09/2016	FD	59029941	**200**	--	--	**200**	--	--	--	--	--	0.100	U	--	**95.0**	--	--	**79.0**	--	--	0.500	U	--	**36.0**	--	--	--	--	--	**15.0**	--	--
YVD-12	YVD-12-160622	6/22/2016	N	59037271	**190**	--	--	**190**	--	--	--	--	--	0.100	UJ	MSD	**89.0**	--	--	**90.0**	--	--	5.00	U	--	**36.0**	--	--	--	--	--	**14.0**	--	--
YVD-12	YVD-12-160929	9/29/2016	N	K1611704	**188**	--	--	**188**	--	--	--	--	--	0.050	U	MBK	**88.9**	--	--	**83.5**	--	--	**0.330**	--	--	**37.2**	--	--	--	--	--	**13.5**	--	--
YVD-12	YVD-12-161213	12/13/2016	N	K1615083	**183**	--	--	**183**	--	--	--	--	--	0.050	U	--	**93.4**	--	--	**81.7**	--	--	**0.330**	--	--	**33.6**	--	--	--	--	--	**12.2**	--	--
YVD-12	YVD-030917-20	3/9/2017	N	K1702404	**132**	--	--	**132**	--	--	--	--	--	0.050	U	--	**97.3**	--	--	**91.7**	--	--	**0.380**	--	--	**35.4**	--	--	--	--	--	**13.4**	--	--
YVD-12	YVD-060617-25	6/6/2017	N	K1705833	**183**	--	--	**183**	--	--	--	--	--	0.050	U	--	**98.4**	--	--	**94.1**	--	--	**0.320**	--	--	**35.8**	--	--	--	--	--	**13.6**	--	--
YVD-12	YVD-092517-15	9/25/2017	N	K1710333	**188**	--	--	**188**	--	--	--	--	--	0.050	U	--	**97.6**	--	--	**94.7**	--	--	**0.340**	--	--	**34.2**	--	--	--	--	--	**14.0**	--	--
YVD-12	YVD-120417-03	12/4/2017	N	K1713026	**186**	--	--	**186**	--	--	--	--	--	0.050	U	--	**89.7**	--	--	**85.4**	--	--	**0.410**	--	--	**32.9**	--	--	--	--	--	**13.4**	--	--
YVD-12	YVD-031918-13	3/19/2018	N	870610	**181**	--	--	**181**	--	--	0.070	U	--	--	--	--	**98.0**	--	--	**97.7**	--	--	**0.350**	--	--	**35.3**	--	--	--	--	--	**13.6**	--	--
YVD-12	YVD-060318-11	6/3/2018	N	874568	**178**	--	--	**178**	--	--	0.070	U	FBK	--	--	--	**103**	--	--	**100**	--	--	**0.340**	--	--	**38.4**	--	--	--	--	--	**15.1**	--	--
YVD-12	YVD-090918-16	9/9/2018	N	880601	**185**	--	--	**185**	--	--	0.070	U	--	--	--	--	**110**	--	--	**105**	--	--	**0.330**	--	--	**38.7**	--	--	--	--	--	**15.8**	--	--
YVD-12	YVD-121018-13	12/10/2018	N	884857	**184**	--	--	**184**	--	--	0.070	U	--	--	--	--	**106**	--	--	**98.9**	--	--	0.290	U	FBK	**37.7**	J	MSD	--	--	--	**15.5**	--	--
YVD-12	YVD-031719-07	3/17/2019	N	988239	**189**	--	--	**189**	--	--	0.070	U	--	--	--	--	**104**	--	--	**97.6**	--	--	0.310	U	FBK	**38.0**	--	--	--	--	--	**18.4**	--	--
YVD-12	YVD-060319-27	6/3/2019	N	992053	**185**	--	--	**185**	--	--	0.070	U	--	--	--	--	**104**	--	--	**96.7**	--	--	**0.240**	--	--	**38.1**	--	--	--	--	--	**18.9**	--	--
YVD-12	YVD-090919-16	9/9/2019	N	998357	**185**	--	--	**185**	--	--	0.070	U	--	--	--	--	**106**	--	--	**95.6**	--	--	**0.290**	--	--	**37.5**	--	--	--	--	--	**16.5**	--	--
YVD-12	YVD-120919-12	12/9/2019	N	902276	**190**	--	--	**190**	--	--	**0.300**	--	--	--	--	--	**104**	--	--	**97.8**	--	--	**0.320**	--	--	**38.8**	--	--	--	--	--	**19.6**	--	--
YVD-12	YVD-033020-11	3/30/2020	N	006241	**183**	--	--	**183**	--	--	0.070	U	--	--	--	--	**99.5**	--	--	**99.5**	--	--	**0.320**	--	--	**36.3**	--	--	--	--	--	**17.1**	--	--
YVD-12	YVD-060920-22	6/9/2020	N	009269	**186**	--	--	**186**	--	--	0.070	U	--	--	--	--	**110**	--	--	**101**	--	--	**0.290**	--	--	**38.7**	--	--	--	--	--	**19.5**	--	--
YVD-12	YVD-092120-18	9/21/2020	N	013896	**180**	--	--	**180**	--	--	0.070	U	--	--	--	--	**96.5**	--	--	**99.3**	--	--	**0.270**	--	--	**35.5**	--	--	--	--	--	**13.8**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-12	YVD-120820-19	12/8/2020	N	017137	**184**	--	--	**184**	--	--	0.070	U	--	--	--	--	**101**	--	--	**114**	--	--	**0.280**	--	--	**36.9**	--	--	--	--	--	**15.2**	--	--
YVD-12	YVD-030221-19	3/2/2021	N	120034	**184**	--	--	**184**	--	--	0.070	U	--	--	--	--	**101**	--	--	**98.1**	--	--	**0.300**	--	--	**36.6**	--	--	--	--	--	**14.8**	--	--
YVD-12	YVD-060821-25	6/8/2021	N	124212	**180**	--	--	**180**	--	--	0.070	U	--	--	--	--	**102**	--	--	**100**	--	--	**0.250**	--	--	**37.0**	--	--	--	--	--	**14.4**	--	--
YVD-12	YVD-121521-18	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**13.4**	J	HTQ, MS
YVD-12	YVD-031522-21	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**14.6**	--	--
YVD-12	YVD-060622-20	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**19.5**	--	--
YVD-12	YVD-091322-09	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**13.8**	--	--
YVD-12	YVD-120822-16	12/8/2022	N	K2214578	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**14.7**	--	--
YVD-12	YVD-030523-02	3/5/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**15.5**	--	--	--	--	--
YVD-12	YVD-062123-31	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**20.5**	J	HTQ
YVD-13	YVD-13-130919	09/19/2013	N	SWI0138	**134**	--	--	**135**	--	--	--	--	--	0.100	U	--	**102**	--	--	**90.3**	--	--	5.00	U	--	**29.9**	--	--	--	--	--	**27.6**	--	--
YVD-13	YVD-13-131211	12/11/2013	N	SWL0073	**139**	--	--	**140**	--	--	--	--	--	0.020	UJ	MSD	**101**	--	--	**77.8**	--	--	5.00	U	--	**29.4**	--	--	--	--	--	**21.7**	--	--
YVD-13	YVD-13-140318	03/18/2014	N	SXC0095	**134**	--	--	**135**	--	--	--	--	--	**0.288**		--	**102**	--	--	**80.3**	--	--	5.00	U	--	**29.3**	--	--	--	--	--	**24.2**	--	--
YVD-13	YVD-13-140603	06/03/2014	N	SXF0017	**129**	--	--	**130**	--	--	--	--	--	**0.103**		--	**94.8**	--	--	**39.7**	--	--	2.00	U	--	**27.7**	--	--	--	--	--	**12.4**	--	--
YVD-13	YVD-13-140923	09/23/2014	N	SXI0173	**124**	--	--	**125**	--	--	--	--	--	0.100	U	--	**104**	--	--	**81.7**	--	--	5.00	U	--	**29.0**	--	--	--	--	--	**26.7**	--	--
YVD-13	YVD-13-141217	12/17/2014	N	SXL0121	**124**	--	--	**125**	--	--	--	--	--	0.100	U	--	**114**	--	--	**86.5**	--	--	5.00	U	--	**33.1**	--	--	--	--	--	**27.3**	--	--
YVD-13	YVD-13-150317	03/17/2015	N	5904541	**130**	--	--	**130**	--	--	--	--	--	0.100	U	--	**100**	--	--	**72.0**	--	--	5.00	U	--	**30.0**	--	--	--	--	--	**24.0**	J--	MSD
YVD-13	YVD-13-150617	06/17/2015	N	59010961	**140**	--	--	**140**	--	--	--	--	--	0.100	U	--	**110**	--	--	**81.0**	--	--	5.00	U	--	**30.0**	--	--	--	--	--	**27.0**	--	--
YVD-13	YVD-13-150924	09/24/2015	N	59020391	**150**	--	--	**150**	--	--	--	--	--	0.100	UJ	MSD	**98.0**	--	--	**70.0**	--	--	5.00	U	--	**31.0**	--	--	--	--	--	**26.0**	J+	MSD
YVD-13	YVD-13-151216	12/16/2015	N	59025501	**140**	--	--	**140**	--	--	--	--	--	--	R	MSD	**100**	--	--	**69.0**	--	--	5.00	U	--	**30.0**	--	--	--	--	--	**26.0**	--	--
YVD-13	YVD-13-160309	03/09/2016	N	59029941	**140**	--	--	**140**	--	--	--	--	--	0.100	U	--	**100**	--	--	**85.0**	--	--	5.00	U	--	**29.0**	--	--	--	--	--	**32.0**	--	--
YVD-13	YVD-13-160622	6/22/2016	N	59037271	**130**	--	--	**130**	--	--	--	--	--	0.100	UJ	MSD	**100**	--	--	**76.0**	--	--	5.00	U	--	**30.0**	--	--	--	--	--	**28.0**	--	--
YVD-13	YVD-13-160928	9/28/2016	N	K1611698	**133**	--	--	**133**	--	--	--	--	--	0.050	U	MBK	**101**	--	--	**60.0**	--	--	**0.300**	--	--	**28.1**	--	--	--	--	--	**23.5**	J	HTQ
YVD-13	YVD-13-161214	12/13/2016	N	K1615083	**132**	--	--	**132**	--	--	--	--	--	0.050	U	--	**100**	--	--	**57.3**	--	--	**0.330**	--	--	**27.5**	--	--	--	--	--	**23.1**	--	--
YVD-13	YVD-030717-08	3/7/2017	N	K1702324	**138**	--	--	**138**	--	--	--	--	--	1.00	U	--	**96.9**	--	--	**52.8**	--	--	**0.350**	--	--	**26.7**	--	--	--	--	--	**23.3**	J	HTQ
YVD-13	YVD-030717-10	3/7/2017	FD	K1702324	**139**	--	--	**139**	--	--	--	--	--	1.00	U	--	**97.3**	--	--	**53.6**	--	--	**0.370**	--	--	**27.1**	--	--	--	--	--	**23.7**	J	HTQ
YVD-13	YVD-060717-33	6/7/2017	N	K1705833	**134**	--	--	**134**	--	--	--	--	--	0.050	U	--	**99.0**	--	--	**54.6**	--	--	**0.300**	--	--	**27.9**	--	--	--	--	--	**22.7**	--	--
YVD-13	YVD-092617-25	9/26/2017	N	K1710333	**142**	--	--	**142**	--	--	--	--	--	0.050	U	--	**94.9**	--	--	**52.8**	--	--	**0.330**	--	--	**24.5**	--	--	--	--	--	**23.2**	--	--
YVD-13	YVD-120417-07	12/4/2017	N	K1713026	**141**	--	--	**141**	--	--	--	--	--	0.050	U	--	**93.4**	--	--	**53.9**	--	--	**0.360**	--	--	**24.5**	--	--	--	--	--	**24.3**	--	--
YVD-13	YVD-031918-19	3/19/2018	N	870634	**138**	--	--	**138**	--	--	0.070	U	--	--	--	--	**96.0**	--	--	**63.0**	--	--	**0.340**	--	--	**25.5**	--	--	--	--	--	**25.8**	--	--
YVD-13	YVD-060318-09	6/3/2018	N	874568	**137**	--	--	**137**	--	--	0.070	U	--	--	--	--	**91.0**	--	--	**63.3**	--	--	**0.350**	--	--	**25.9**	--	--	--	--	--	**25.2**	--	--
YVD-13	YVD-090918-14	9/9/2018	N	880601	**140**	--	--	**140**	--	--	0.070	U	--	--	--	--	**92.0**	--	--	**66.6**	--	--	**0.340**	--	--	**24.6**	--	--	--	--	--	**26.1**	--	--
YVD-13	YVD-121018-11	12/10/2018	N	884857	**142**	--	--	**142**	--	--	0.070	U	--	--	--	--	**87.5**	--	--	**70.8**	--	--	0.250	U	FBK	**24.2**	J	MSD	--	--	--	**28.6**	--	--
YVD-13	YVD-031819-15	3/18/2019	N	988273	**153**	--	--	**153**	--	--	0.070	U	--	--	--	--	**91.0**	--	--	**74.4**	--	--	**0.310**	--	--	**24.5**	--	--	--	--	--	**29.1**	--	--
YVD-13	YVD-060319-25	6/3/2019	N	992053	**142**	--	--	**142**	--	--	0.070	U	--	--	--	--	**90.0**	--	--	**40.9**	--	--	**0.230**	--	--	**24.4**	--	--	--	--	--	**28.0**	--	--
YVD-13	YVD-090919-10	9/9/2019	N	998357	**143**	--	--	**143**	--	--	0.070	U	--	--	--	--	**90.0**	--	--	**67.6**	--	--	**0.380**	--	--	**24.0**	--	--	--	--	--	**31.0**	--	--
YVD-13	YVD-120919-10	12/9/2019	N	902276	**138**	--	--	**138**	--	--	0.070	U	--	--	--	--	**88.0**	--	--	**73.4**	--	--	**0.370**	--	--	**24.1**	--	--	--	--	--	**30.9**	--	--
YVD-13	YVD-033020-09	3/30/2020	N	006241	**140**	--	--	**140**	--	--	0.070	U	--	--	--	--	**87.5**	--	--	**77.0**	--	--	**0.340**	--	--	**24.1**	--	--	--	--	--	**30.9**	--	--
YVD-13	YVD-060920-21	6/9/2020	N	009269	**139**	--	--	**139**	--	--	0.070	U	--	--	--	--	**89.5**	--	--	**71.1**	--	--	**0.290**	--	--	**24.6**	--	--	--	--	--	**28.5**	--	--
YVD-13	YVD-092120-13	9/21/2020	N	013896	**138**	--	--	**138**	--	--	0.070	U	--	--	--	--	**92.0**	--	--	**79.7**	--	--	**0.300**	--	--	**25.1**	--	--	--	--	--	**32.3**	--	--
YVD-13	YVD-120820-17	12/8/2020	N	017137	**137**	--	--	**137**	--	--	0.070	U	--	--	--	--	**90.5**	--	--	**64.8**	--	--	**0.330**	--	--	**25.1**	--	--	--	--	--	**27.1**	--	--
YVD-13	YVD-030221-15	3/2/2021	N	120034	**144**	--	--	**144**	--	--	0.070	U	--	--	--	--	**93.5**	--	--	**83.0**	--	--	**0.340**	--	--	**25.5**	--	--	--	--	--	**34.3**	--	--
YVD-13	YVD-060821-32	6/8/2021	N	124212	**142**	--	--	**142**	--	--	0.070	U	--	--	--	--	**92.5**	--	--	**82.8**	--	--	**0.310**	--	--	**25.5**	--	--	--	--	--	**34.0**	--	--
YVD-13	YVD-121521-16	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**34.0**	J	HTQ, MS
YVD-13	YVD-031522-20	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**35.7**	--	--
YVD-13	YVD-060722-24	6/7/2022	N	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**36.2**	J	HTQ
YVD-13	YVD-091322-11	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**35.5**	--	--
YVD-13	YVD-122722-18	12/27/2022	N	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**36.0**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-13	YVD-030623-08	3/6/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**37.3**	--	--	--	--	--
YVD-13	YVD-030623-09	3/6/2023	FD	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**37.0**	--	--	--	--	--
YVD-13	YVD-062023-14	6/20/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**35.0**	J	HTQ
YVD-14	YVD-14-130918	09/18/2013	N	SWI0123	**605**	--	--	**605**	--	--	--	--	--	0.100	U	--	**260**	--	--	**118**	--	--	5.00	U	--	**65.4**	--	--	--	--	--	**112**	--	--
YVD-14	YVD-14-131212	12/12/2013	N	SWL0078	**544**	--	--	**545**	--	--	--	--	--	0.020	U	--	**249**	--	--	**104**	--	--	5.00	U	--	**65.6**	--	--	--	--	--	**105**	--	--
YVD-14	YVD-14-140319	03/19/2014	N	SXC0107	**634**	--	--	**635**	--	--	--	--	--	0.100	U	--	**248**	--	--	**108**	--	--	5.00	U	--	**64.5**	--	--	--	--	--	**101**	--	--
YVD-14	YVD-14-140604	06/04/2014	N	SXF0025	**569**	--	--	**570**	--	--	--	--	--	0.100	U	--	**240**	--	--	**109**	--	--	5.00	U	--	**63.2**	--	--	--	--	--	**102**	--	--
YVD-14	YVD-14-140924	09/24/2014	N	SXI0173	**554**	--	--	**555**	--	--	--	--	--	**0.107**	--	--	**268**	--	--	**110**	--	--	5.00	U	--	**72.0**	--	--	--	--	--	**96.7**	--	--
YVD-14	YVD-14-141217	12/17/2014	N	SXL0121	**539**	--	--	**540**	--	--	--	--	--	0.100	U	--	**252**	--	--	**110**	--	--	5.00	U	--	**70.9**	--	--	--	--	--	**96.1**	--	--
YVD-14	YVD-14-150318	03/18/2015	N	5904651	**530**	--	--	**530**	--	--	--	--	--	**0.110**	--	--	**260**	--	--	**110**	--	--	5.00	U	--	**70.0**	--	--	--	--	--	**91.0**	--	--
YVD-14R	YVD-14R-151216	12/16/2015	N	59025501	**550**	--	--	**550**	--	--	--	--	--	--	R	MSD	**250**	--	--	**110**	--	--	5.00	U	--	**69.0**	--	--	--	--	--	**98.0**	--	--
YVD-14R	YVD-14R-160309	03/09/2016	N	59029941	**600**	--	--	**600**	--	--	--	--	--	0.100	U	--	**250**	--	--	**110**	--	--	5.00	U	--	**67.0**	--	--	--	--	--	**100**	--	--
YVD-14R	YVD-14R-160622	6/22/2016	N	59037271	**490**	--	--	**490**	--	--	--	--	--	0.100	UJ	MSD	**230**	--	--	**110**	--	--	5.00	U	--	**67.0**	--	--	--	--	--	**110**	--	--
YVD-14R	YVD-14R-160928	9/28/2016	N	K1611698	**535**	--	--	**535**	--	--	--	--	--	0.050	U	MBK	**252**	--	--	**95.7**	--	--	**0.160**	J	--	**65.9**	--	--	--	--	--	**92.1**	J	HTQ
YVD-14R	YVD-14R-161212	12/12/2016	N	K1615029	**578**	--	--	**578**	--	--	--	--	--	0.050	U	--	**251**	--	--	**94.7**	--	--	**0.240**	--	--	**65.7**	--	--	--	--	--	**92.3**	J	HTQ
YVD-14R	YVD-D1-161212	12/12/2016	FD	K1615029	**571**	--	--	**571**	--	--	--	--	--	0.050	U	--	**255**	--	--	**93.3**	--	--	**0.190**	--	--	**66.5**	--	--	--	--	--	**92.3**	J	HTQ
YVD-14R	YVD-030917-19	3/9/2017	N	K1702404	**526**	--	--	**526**	--	--	--	--	--	0.050	U	--	**257**	--	--	**97.0**	--	--	**0.180**	J	--	**66.1**	--	--	--	--	--	**91.1**	--	--
YVD-14R	YVD-030917-21	3/9/2017	FD	K1702404	**514**	--	--	**514**	--	--	--	--	--	0.050	U	--	**251**	--	--	**95.0**	--	--	**0.190**	J	--	**65.2**	--	--	--	--	--	**92.2**	J	HTQ
YVD-14R	YVD-060517-06	6/5/2017	N	K1705702	**505**	--	--	**505**	--	--	--	--	--	0.050	U	--	**243**	--	--	**98.4**	--	--	**0.200**	--	--	**62.3**	--	--	--	--	--	**95.7**	--	--
YVD-14R	YVD-092517-14	9/25/2017	N	K1710333	**515**	--	--	**515**	--	--	--	--	--	0.050	U	--	**238**	--	--	**99.8**	--	--	**0.180**	J	--	**61.2**	--	--	--	--	--	**97.3**	--	--
YVD-14R	YVD-120417-12	12/4/2017	N	K1713026	**504**	--	--	**504**	--	--	--	--	--	0.050	U	--	**230**	--	--	**98.3**	--	--	**0.220**	--	--	**59.3**	--	--	--	--	--	**96.7**	--	--
YVD-14R	YVD-031818-11	3/18/2018	N	870610	**514**	--	--	**514**	--	--	**0.170**	--	--	--	--	--	**232**	--	--	**102**	--	--	**0.130**	--	--	**60.0**	--	--	--	--	--	**90.2**	--	--
YVD-14R	YVD-060318-04	6/3/2018	N	874568	**521**	--	--	**521**	--	--	0.190	U	FBK	--	--	--	**233**	--	--	**105**	--	--	**0.150**	--	--	**63.0**	--	--	--	--	--	**96.5**	--	--
YVD-14R	YVD-090918-09	9/9/2018	N	880601	**532**	--	--	**532**	--	--	0.070	U	--	--	--	--	**250**	--	--	**115**	--	--	**0.180**	--	--	**63.5**	--	--	--	--	--	**115**	--	--
YVD-14R	YVD-121018-02	12/10/2018	N	884857	**528**	--	--	**528**	--	--	0.070	U	--	--	--	--	**256**	--	--	**133**	--	--	0.150	U	FBK	**66.0**	J	MSD	--	--	--	**117**	--	--
YVD-14R	YVD-121018-04	12/10/2018	FD	884857	**528**	--	--	**528**	--	--	0.070	U	--	--	--	--	**254**	--	--	**132**	--	--	0.150	U	FBK	**66.0**	J	MSD	--	--	--	**115**	--	--
YVD-14R	YVD-031819-12	3/18/2019	N	988273	**531**	--	--	**531**	--	--	0.070	U	--	--	--	--	**277**	--	--	**151**	--	--	**0.440**	J	DUP	**71.5**	--	--	--	--	--	**138**	--	--
YVD-14R	YVD-031819-14	3/18/2019	FD	988273	**532**	--	--	**532**	--	--	0.070	U	--	--	--	--	**275**	--	--	**148**	--	--	**0.130**	J	DUP	**70.5**	--	--	--	--	--	**135**	--	--
YVD-14R	YVD-060319-22	6/3/2019	N	992053	**542**	--	--	**542**	--	--	**0.120**	U	--	--	--	--	**284**	--	--	**149**	--	--	**0.220**	--	--	**73.5**	--	--	--	--	--	**136**	--	--
YVD-14R	YVD-060319-24	6/3/2019	FD	992053	**538**	--	--	**538**	--	--	0.070	U	--	--	--	--	**270**	--	--	**130**	--	--	0.100	U	--	**71.5**	--	--	--	--	--	**138**	--	--
YVD-14R	YVD-090919-13	9/9/2019	N	998357	**560**	--	--	**560**	--	--	0.070	U	--	--	--	--	**280**	--	--	**130**	--	--	**0.130**	--	--	**73.0**	--	--	--	--	--	**140**	--	--
YVD-14R	YVD-121019-15	12/10/2019	N	902321	**533**	--	--	**533**	--	--	0.070	U	--	--	--	--	**255**	--	--	**128**	--	--	**0.130**	--	--	**66.5**	--	--	--	--	--	**126**	--	--
YVD-14R	YVD-121019-17	12/10/2019	FD	902321	**543**	--	--	**543**	--	--	0.070	U	--	--	--	--	**256**	--	--	**128**	--	--	**0.130**	--	--	**66.5**	--	--	--	--	--	**125**	--	--
YVD-14R	YVD-033020-02	3/30/2020	N	006241	**555**	--	--	**555**	--	--	0.070	U	--	--	--	--	**262**	--	--	**134**	--	--	**0.130**	--	--	**68.0**	--	--	--	--	--	**126**	--	--
YVD-14R	YVD-033020-04	3/30/2020	FD	006241	**556**	--	--	**556**	--	--	0.070	U	--	--	--	--	**262**	--	--	**132**	--	--	**0.130**	--	--	**68.0**	--	--	--	--	--	**127**	--	--
YVD-14R	YVD-060920-20	6/9/2020	N	009269	**569**	--	--	**569**	--	--	0.070	U	--	--	--	--	**269**	--	--	**149**	--	--	**0.110**	--	--	**70.5**	--	--	--	--	--	**130**	--	--
YVD-14R	YVD-092120-14	9/21/2020	N	013896	**560**	--	--	**560**	--	--	0.070	U	--	--	--	--	**260**	--	--	**141**	--	--	**0.210**	--	--	**68.5**	--	--	--	--	--	**122**	--	--
YVD-14R	YVD-120820-20	12/8/2020	N	017137	**556**	--	--	**556**	--	--	0.070	U	--	--	--	--	**263**	--	--	**148**	--	--	**0.120**	--	--	**68.0**	--	--	--	--	--	**119**	--	--
YVD-14R	YVD-030121-08	3/1/2021	N	119931	**564**	--	--	**564**	--	--	0.070	U	--	--	--	--	**266**	--	--	**139**	--	--	**0.140**	--	--	**70.5**	--	--	--	--	--	**129**	--	--
YVD-14R	YVD-060621-09	6/6/2021	N	124053	**558**	--	--	**558**	--	--	0.070	U	--	--	--	--	**262**	--	--	**131**	--	--	**0.140**	--	--	**68.0**	--	--	--	--	--	**121**	--	--
YVD-14R	YVD-121421-08	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**118**	J	HTQ, MS
YVD-14R	YVD-031422-07	3/14/2022	N	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**134**	--	--
YVD-14R	YVD-060522-09	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**125**	--	--
YVD-14R	YVD-091422-15	9/14/2022	N	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**121**	--	--
YVD-14R	YVD-120822-13	12/8/2022	N	K2214578	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**119**	--	--
YVD-14R	YVD-120822-14	12/8/2022	FD	K2214578	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**118**	--	--
YVD-14R	YVD-030523-03	3/5/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**125**	--	--	--	--	--
YVD-14R	YVD-062123-29	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**117**	J	HTQ

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-15	YVD-15-130917	09/17/2013	N	SWI0123	**514**	--	--	**515**	--	--	--	--	--	0.100	U	--	**125**	--	--	**62.8**	--	--	5.00	U	--	**51.6**	--	--	--	--	--	**72.5**	--	--
YVD-15	YVD-15-131212	12/12/2013	N	SWL0078	**494**	--	--	**495**	--	--	--	--	--	0.020	U	--	**131**	--	--	**120**	--	--	5.00	U	--	**59.4**	--	--	--	--	--	**71.2**	--	--
YVD-15	YVD-15-140319	03/19/2014	N	SXC0107	**534**	--	--	**535**	--	--	--	--	--	**0.112**	--	--	**124**	--	--	**54.9**	--	--	5.00	U	--	**57.9**	--	--	--	--	--	**47.4**	--	--
YVD-15	YVD-15-140603	06/03/2014	N	SXF0025	**509**	--	--	**510**	--	--	--	--	--	0.100	U	--	**138**	--	--	**82.5**	--	--	5.00	U	--	**64.7**	--	--	--	--	--	**88.1**	--	--
YVD-15	YVD-15-140924	09/24/2014	N	SXI0173	**541**	--	--	**545**	--	--	--	--	--	**0.246**	--	--	**132**	--	--	**58.7**	--	--	5.00	U	--	**56.9**	--	--	--	--	--	**54.8**	--	--
YVD-15	YVD-15-141217	12/17/2014	N	SXL0121	**518**	--	--	**520**	--	--	--	--	--	0.100	U	--	**175**	--	--	**57.6**	--	--	5.00	U	--	**81.6**	--	--	--	--	--	**66.9**	--	--
YVD-15	YVD-15-150317	03/17/2015	N	5904651	**550**	--	--	**550**	--	--	--	--	--	0.100	U	--	**280**	--	--	**65.0**	--	--	5.00	U	--	**130**	--	--	--	--	--	**67.0**	--	--
YVD-15	YVD-15-150617	06/17/2015	N	59011021	**550**	--	--	**550**	--	--	--	--	--	0.100	U	--	**140**	--	--	**42.0**	--	--	0.500	U	--	**66.0**	J	RPD	--	--	--	**39.0**	J--	MSD, HTQ
YVD-15	YVD-15-150925	09/25/2015	N	59020431	**480**	--	--	**480**	--	--	--	--	--	0.100	U	--	**98.0**	--	--	**22.0**	--	--	5.00	U	--	**46.0**	--	--	--	--	--	**14.0**	--	--
YVD-15	YVD-15-151215	12/15/2015	N	59025431	**540**	J	FDP	**540**	J	FDP	--	--	--	--	R	MSD	**120**	--	--	**37.0**	--	--	5.00	U	--	**59.0**	--	--	--	--	--	**38.0**	--	--
YVD-15	YVD-15-160309	03/09/2016	N	59029711	**520**	--	--	**520**	--	--	--	--	--	0.100	UJ	FDP	**120**	--	--	**32.0**	--	--	5.00	U	--	**60.0**	--	--	--	--	--	**36.0**	--	--
YVD-15	YVD-15-160621	6/21/2016	N	59037271	**430**	--	--	**430**	--	--	--	--	--	**0.130**	J--	MSD	**110**	--	--	**26.0**	--	--	5.00	U	--	**56.0**	--	--	--	--	--	**31.0**	--	--
YVD-15	YVD-15-160928	9/28/2016	N	K1611629	**401**	--	--	**401**	--	--	--	--	--	0.050	U	MBK	**112**	--	--	**22.5**	--	--	**0.290**	--	--	**50.9**	--	--	--	--	--	**26.6**	--	--
YVD-15	YVD-15-161215	12/15/2016	N	K1615126	**395**	--	--	**395**	--	--	--	--	--	0.050	U	--	**113**	--	--	**22.1**	--	--	**0.320**	--	--	**50.4**	--	--	--	--	--	**25.5**	--	--
YVD-15	YVD-030917-23	3/9/2017	N	K1702404	**395**	--	--	**395**	--	--	--	--	--	0.050	U	--	**119**	--	--	**23.0**	--	--	**0.340**	--	--	**52.9**	--	--	--	--	--	**25.0**	J	HTQ
YVD-15	YVD-060617-20	6/6/2017	N	K1705754	**399**	--	--	**399**	--	--	--	--	--	0.050	U	--	**126**	--	--	**21.8**	--	--	**0.320**	--	--	**54.6**	--	--	--	--	--	**23.0**	--	--
YVD-15	YVD-092517-10	9/25/2017	N	K1710333	**412**	--	--	**412**	--	--	--	--	--	0.050	U	--	**112**	--	--	**22.1**	--	--	**0.350**	--	--	**50.2**	--	--	--	--	--	**21.8**	--	--
YVD-15	YVD-120517-28	12/5/2017	N	K1713091	**414**	--	--	**414**	--	--	--	--	--	0.050	U	--	**112**	--	--	**21.8**	--	--	**0.340**	--	--	**48.0**	--	--	--	--	--	**22.7**	J	HTQ
YVD-15	YVD-031818-09	3/18/2018	N	870610	**397**	--	--	**397**	--	--	0.070	U	--	--	--	--	**104**	--	--	**21.7**	--	--	**0.320**	--	--	**46.6**	--	--	--	--	--	**24.4**	--	--
YVD-15	YVD-060318-08	6/3/2018	N	874568	**401**	--	--	**401**	--	--	0.070	U	FBK	--	--	--	**100**	--	--	**22.0**	--	--	**0.340**	--	--	**45.5**	--	--	--	--	--	**27.0**	--	--
YVD-15	YVD-090918-11	9/9/2018	N	880601	**395**	--	--	**395**	--	--	0.070	U	--	--	--	--	**97.5**	--	--	**22.8**	--	--	**0.350**	--	--	**42.7**	--	--	--	--	--	**24.4**	--	--
YVD-15	YVD-121018-06	12/10/2018	N	884857	**400**	--	--	**400**	--	--	0.070	U	--	--	--	--	**92.5**	--	--	**24.3**	--	--	0.330	U	FBK	**41.0**	J	MSD	--	--	--	**26.3**	--	--
YVD-15	YVD-031719-10	3/17/2019	N	988239	**394**	--	--	**394**	--	--	0.070	U	--	--	--	--	**91.5**	--	--	**21.1**	--	--	0.310	U	FBK	**39.8**	--	--	--	--	--	**24.3**	--	--
YVD-15	YVD-060419-29	6/4/2019	N	992242	**390**	--	--	**390**	--	--	0.070	U	--	--	--	--	**92.0**	--	--	**19.5**	--	--	**0.300**	--	--	**40.8**	--	--	--	--	--	**23.6**	--	--
YVD-15	YVD-090919-11	9/9/2019	N	998357	**407**	--	--	**407**	--	--	0.070	U	--	--	--	--	**91.0**	--	--	**21.8**	--	--	**0.340**	--	--	**39.4**	--	--	--	--	--	**23.4**	--	--
YVD-15	YVD-121019-19	12/10/2019	N	902321	**400**	--	--	**400**	--	--	0.070	U	--	--	--	--	**88.0**	--	--	**20.5**	--	--	**0.370**	--	--	**38.7**	--	--	--	--	--	**23.5**	--	--
YVD-15	YVD-033020-06	3/30/2020	N	006241	**396**	--	--	**396**	--	--	0.070	U	--	--	--	--	**86.5**	--	--	**20.6**	--	--	**0.370**	--	--	**38.3**	--	--	--	--	--	**22.3**	--	--
YVD-15	YVD-060920-16	6/9/2020	N	009269	**397**	--	--	**397**	--	--	0.070	U	--	--	--	--	**86.5**	--	--	**20.8**	--	--	**0.310**	--	--	**38.1**	--	--	--	--	--	**21.0**	--	--
YVD-15	YVD-092020-09	9/20/2020	N	013864	**390**	--	--	**390**	--	--	0.070	U	--	--	--	--	**87.5**	--	--	**21.1**	--	--	**0.310**	--	--	**38.7**	--	--	--	--	--	**21.2**	--	--
YVD-15	YVD-120720-14	12/7/2020	N	017035	**390**	--	--	**390**	--	--	0.070	U	--	--	--	--	**87.0**	--	--	**20.7**	--	--	**0.420**	--	--	**39.0**	--	--	--	--	--	**19.7**	--	--
YVD-15	YVD-030121-14	3/1/2021	N	119931	**397**	--	--	**397**	--	--	0.070	U	--	--	--	--	**87.5**	--	--	**21.1**	--	--	**0.340**	--	--	**39.4**	--	--	--	--	--	**22.0**	--	--
YVD-15	YVD-060621-08	6/6/2021	N	124053	**428**	--	--	**428**	--	--	0.070	U	--	--	--	--	**94.5**	--	--	**21.8**	--	--	**0.290**	--	--	**41.7**	--	--	--	--	--	**21.6**	--	--
YVD-15	YVD-121421-07	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**15.1**	--	--
YVD-15	YVD-031422-05	3/14/2022	N	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**34.5**	--	--
YVD-15	YVD-060522-07	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**16.3**	--	--
YVD-15	YVD-091422-19	9/14/2022	N	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**17.3**	--	--
YVD-15	YVD-120622-07	12/6/2022	N	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**16.0**	--	--
YVD-15	YVD-030523-04	3/5/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**11.7**	--	--	--	--	--
YVD-15	YVD-062123-25	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**12.4**	J	HTQ
YVD-16	YVD-16-130923	09/23/2013	N	SWI0178	**391**	--	--	**391**	--	--	--	--	--	0.100	U	--	**85.0**	--	--	--	--	--	--	--	--	**32.9**	--	--	--	--	--	--	--	--
YVD-16	YVD-16-130926	09/26/2013	N	SWI0190	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**44.1**	--	--	5.00	U	--	--	--	--	--	--	--	**28.8**	--	--
YVD-16	YVD-16-131212	12/12/2013	N	SWL0073	**309**	--	--	**310**	--	--	--	--	--	0.020	UJ	MSD	**87.7**	--	--	**46.7**	--	--	5.00	U	--	**32.1**	--	--	--	--	--	**28.8**	--	--
YVD-16	YVD-16-140318	03/18/2014	N	SXC0107	**298**	--	--	**300**	--	--	--	--	--	0.100	U	--	**105**	--	--	**46.1**	--	--	5.00	U	--	**53.2**	--	--	--	--	--	**23.5**	--	--
YVD-16	YVD-16-140603	06/03/2014	N	SXF0017	**287**	--	--	**288**	--	--	--	--	--	0.100	U	--	**86.3**	--	--	**36.7**	--	--	2.00	U	--	**37.0**	--	--	--	--	--	**21.9**	--	--
YVD-16	YVD-16-140923	09/23/2014	N	SXI0173	**303**	--	--	**305**	--	--	--	--	--	0.100	U	--	**99.2**	--	--	**38.0**	--	--	2.50	U	--	**38.9**	--	--	--	--	--	**21.4**	--	--
YVD-16	YVD-16-141217	12/17/2014	N	SXL0121	**298**	--	--	**300**	--	--	--	--	--	0.100	U	--	**94.9**	--	--	**37.9**	--	--	2.50	U	--	**37.1**	--	--	--	--	--	**20.6**	--	--
YVD-16	YVD-D3-141217	12/17/2014	FD	SXL0121	**308**	--	--	**310**	--	--	--	--	--	0.100	U	--	**92.9**	--	--	**39.9**	--	--	0.500	U	--	**36.2**	--	--	--	--	--	**22.4**	--	--
YVD-16	YVD-16-150317	03/17/2015	N	5904651	**310**	--	--	**310**	--	--	--	--	--	**0.110**	--	--	**93.0**	--	--	**39.0**	--	--	2.50	U	--	**34.0**	--	--	--	--	--	**22.0**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-16	YVD-16-150616	06/16/2015	N	59010961	**310**	--	--	**310**	--	--	--	--	--	**0.100**	--	--	**96.0**	--	--	**43.0**	--	--	2.50	U	--	**35.0**	--	--	--	--	--	**23.0**	--	--
YVD-16	YVD-16-150923	09/23/2015	N	59020281	**330**	--	--	**330**	--	--	--	--	--	0.100	U	--	**88.0**	--	--	**39.0**	--	--	2.50	U	--	**37.0**	--	--	--	--	--	**23.0**	--	--
YVD-16	YVD-16-151215	12/15/2015	N	59025431	**350**	J	FDP	**350**	J	FDP	--	--	--	--	R	MSD	**89.0**	--	--	**38.0**	--	--	2.50	U	--	**34.0**	--	--	--	--	--	**22.0**	--	--
YVD-16	YVD-16-160309	03/09/2016	N	59029711	**300**	--	--	**300**	--	--	--	--	--	**0.150**	J	FDP	**90.0**	--	--	**39.0**	--	--	2.50	U	--	**36.0**	--	--	--	--	--	**23.0**	--	--
YVD-16	YVD-16-160621	6/21/2016	N	59037151	**300**	--	--	**300**	--	--	--	--	--	0.100	U	--	**85.0**	--	--	**42.0**	--	--	2.50	U	--	**33.0**	--	--	--	--	--	**22.0**	--	--
YVD-16	YVD-D2-160621	6/21/2016	FD	59037151	**300**	--	--	**300**	--	--	--	--	--	0.100	U	--	**86.0**	--	--	**40.0**	--	--	0.500	U	--	**34.0**	--	--	--	--	--	**22.0**	--	--
YVD-16	YVD-16-160928	9/28/2016	N	K1611629	**301**	--	--	**301**	--	--	--	--	--	0.050	U	MBK	**92.4**	--	--	**33.3**	--	--	**0.220**	--	--	**33.2**	--	--	--	--	--	**19.7**	--	--
YVD-16	YVD-16-161215	12/15/2016	N	K1615126	**298**	--	--	**298**	--	--	--	--	--	0.050	U	--	**88.4**	--	--	**33.7**	--	--	**0.240**	--	--	**31.1**	--	--	--	--	--	**19.7**	--	--
YVD-16	YVD-030917-22	3/9/2017	N	K1702404	**295**	--	--	**295**	--	--	--	--	--	0.050	U	--	**87.1**	--	--	**33.9**	--	--	**0.250**	--	--	**31.2**	--	--	--	--	--	**20.1**	J	HTQ
YVD-16	YVD-060517-12	6/5/2017	N	K1705754	**298**	--	--	**298**	--	--	--	--	--	0.050	U	--	**86.8**	--	--	**33.6**	--	--	**0.250**	--	--	**31.6**	--	--	--	--	--	**19.7**	--	--
YVD-16	YVD-092617-28	9/26/2017	N	K1710381	**309**	--	--	**309**	--	--	--	--	--	0.050	U	--	**89.0**	--	--	**32.8**	--	--	**0.230**	--	--	**31.7**	--	--	--	--	--	**19.1**	J	HTQ
YVD-16	YVD-120517-22	12/5/2017	N	K1713091	**294**	--	--	**294**	--	--	--	--	--	0.050	U	--	**87.9**	--	--	**33.3**	--	--	**0.240**	--	--	**30.1**	--	--	--	--	--	**19.8**	J	HTQ
YVD-16	YVD-031918-16	3/19/2018	N	870634	**297**	--	--	**297**	--	--	0.070	U	--	--	--	--	**88.5**	--	--	**34.4**	--	--	**0.200**	--	--	**30.3**	--	--	--	--	--	**20.3**	--	--
YVD-16	YVD-060318-10	6/3/2018	N	874568	**314**	--	--	**314**	--	--	0.070	U	FBK	--	--	--	**90.0**	--	--	**34.9**	--	--	**0.220**	--	--	**32.8**	--	--	--	--	--	**20.7**	--	--
YVD-16	YVD-090918-07	9/9/2018	N	880601	**309**	--	--	**309**	--	--	0.070	U	--	--	--	--	**89.5**	--	--	**35.7**	--	--	**0.210**	--	--	**30.6**	--	--	--	--	--	**21.4**	--	--
YVD-16	YVD-121118-20	12/11/2018	N	884939	**306**	--	--	**306**	--	--	0.070	U	--	--	--	--	**89.5**	--	--	**32.6**	--	--	**0.190**	--	--	**31.1**	--	--	--	--	--	**21.8**	--	--
YVD-16	YVD-031719-08	3/17/2019	N	988239	**300**	--	--	**300**	--	--	0.070	U	--	--	--	--	**88.5**	--	--	**35.4**	--	--	0.180	U	FBK	**30.7**	--	--	--	--	--	**22.5**	--	--
YVD-16	YVD-060219-06	6/2/2019	N	991939	**301**	--	--	**301**	--	--	0.070	U	--	--	--	--	**88.5**	--	--	24.6	U	FBK	0.170	U	FBK	**30.9**	--	--	--	--	--	**23.3**	--	--
YVD-16	YVD-090919-07	9/9/2019	N	998357	**303**	--	--	**303**	--	--	0.070	U	--	--	--	--	**86.5**	--	--	**36.9**	--	--	**0.210**	--	--	**30.4**	--	--	--	--	--	**22.9**	--	--
YVD-16	YVD-120919-11	12/9/2019	N	902276	**296**	--	--	**296**	--	--	0.070	U	--	--	--	--	**86.0**	--	--	**36.7**	--	--	**0.240**	--	--	**30.4**	--	--	--	--	--	**23.5**	--	--
YVD-16	YVD-033120-16	3/31/2020	N	006260	**287**	--	--	**287**	--	--	0.070	U	--	--	--	--	**85.5**	--	--	**38.0**	--	--	**0.180**	--	--	**30.3**	--	--	--	--	--	**22.8**	--	--
YVD-16	YVD-061020-30	6/10/2020	N	009361	**289**	--	--	**289**	--	--	0.070	U	--	--	--	--	**81.5**	--	--	**37.8**	--	--	**0.170**	--	--	**28.8**	J	MS	--	--	--	**21.8**	--	--
YVD-16	YVD-092020-06	9/20/2020	N	013864	**292**	--	--	**292**	--	--	0.070	U	--	--	--	--	**88.0**	--	--	**39.0**	--	--	**0.170**	--	--	**31.4**	--	--	--	--	--	**22.4**	--	--
YVD-16	YVD-120720-08	12/7/2020	N	017035	**298**	--	--	**298**	--	--	0.070	U	--	--	--	--	**92.5**	--	--	**41.2**	--	--	**0.190**	--	--	**33.2**	--	--	--	--	--	**24.6**	--	--
YVD-16	YVD-030121-02	3/1/2021	N	119931	**290**	--	--	**290**	--	--	0.070	U	--	--	--	--	**90.0**	--	--	**42.9**	--	--	**0.200**	--	--	**32.1**	--	--	--	--	--	**24.3**	--	--
YVD-16	YVD-030121-04	3/1/2021	FD	119931	**288**	--	--	**288**	--	--	0.070	U	--	--	--	--	**91.5**	--	--	**42.9**	--	--	**0.200**	--	--	**32.7**	--	--	--	--	--	**24.7**	--	--
YVD-16	YVD-060621-03	6/6/2021	N	124053	**299**	--	--	**299**	--	--	0.070	U	--	--	--	--	**88.5**	--	--	**37.5**	--	--	**0.160**	--	--	**31.9**	--	--	--	--	--	**21.8**	--	--
YVD-16	YVD-121421-02	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**19.7**	J	HTQ, MS
YVD-16	YVD-121421-03	12/14/2021	FD	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**20.1**	--	--
YVD-16	YVD-031522-17	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**21.4**	--	--
YVD-16	YVD-060622-16	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**21.0**	--	--
YVD-16	YVD-091322-08	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**22.7**	--	--
YVD-16	YVD-120622-05	12/6/2022	N	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**21.9**	--	--
YVD-16	YVD-030523-05	3/5/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**22.0**	--	--	--	--	--
YVD-16	YVD-030523-06	3/5/2023	FD	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**22.0**	--	--	--	--	--
YVD-16	YVD-062023-13	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**24.8**	J	HTQ
YVD-17	YVD-17-130919	09/19/2013	N	SWI0142	**213**	--	--	**215**	--	--	--	--	--	0.100	U	--	**72.7**	--	--	**3.10**	--	--	0.500	U	--	**35.8**	--	--	--	--	--	--	--	--
YVD-17	YVD-17-130924	09/24/2013	N	SWI0175	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**0.800**	--	--
YVD-17	YVD-17-131210	12/10/2013	N	SWL0055	**169**	--	--	**170**	--	--	--	--	--	0.020	UJ	MSD	**54.2**	--	--	**2.98**	--	--	0.500	U	--	**28.4**	--	--	--	--	--	**0.680**	--	--
YVD-17	YVD-17-140316	03/16/2014	N	SXC0081	**144**	--	--	**145**	--	--	--	--	--	**0.166**	--	--	**36.0**	--	--	**3.45**	--	--	**0.650**	--	--	**17.6**	--	--	--	--	--	**1.07**	--	--
YVD-17	YVD-17-140601	06/01/2014	N	SXF0008	**169**	--	--	**170**	--	--	--	--	--	0.100	U	--	**42.3**	--	--	**3.17**	--	--	0.500	U	--	**18.5**	--	--	--	--	--	**0.670**	--	--
YVD-17	YVD-17-140922	09/22/2014	N	SXI0148	**183**	--	--	**185**	--	--	--	--	--	0.100	U	--	**47.5**	--	--	**2.87**	--	--	0.500	U	--	**21.2**	--	--	--	--	--	**0.960**	--	--
YVD-17	YVD-17-141215	12/15/2014	N	SXL0103	**168**	--	--	**170**	--	--	--	--	--	0.100	U	--	**42.1**	--	--	**2.99**	J+	MSD	0.500	U	--	**17.8**	--	--	--	--	--	**0.660**	J	DUP
YVD-17	YVD-17-150316	03/16/2015	N	5904471	**130**	--	--	**130**	--	--	--	--	--	0.100	U	--	**33.0**	--	--	**3.50**	--	--	**0.500**	--	--	**17.0**	--	--	--	--	--	**1.10**	--	--
YVD-17	YVD-D1-150316	03/16/2015	FD	5904471	**130**	--	--	**130**	--	--	--	--	--	0.100	U	--	**33.0**	--	--	**3.50**	--	--	**0.510**	--	--	**17.0**	--	--	--	--	--	**1.20**	--	--
YVD-17	YVD-17-150617	06/17/2015	N	59010961	**160**	--	--	**160**	--	--	--	--	--	0.100	U	--	**41.0**	--	--	**3.00**	--	--	0.500	U	--	**18.0**	--	--	--	--	--	**0.590**	--	--
YVD-17	YVD-17-150924	09/24/2015	N	59020391	**170**	--	--	**170**	--	--	--	--	--	0.100	UJ	MSD	**40.0**	--	--	**3.10**	--	--	**0.600**	--	--	**18.0**	--	--	--	--	--	0.200	U	--
YVD-17	YVD-17-151216	12/16/2015	N	59025501	**180**	--	--	**180**	--	--	--	--	--	--	R	MSD	**38.0**	--	--	**2.60**	--	--	0.500	U	--	**17.0**	--	--	--	--	--	**0.550**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-17	YVD-17-160310	03/10/2016	N	59029941	**150**	--	--	**150**	--	--	--	--	--	0.100	U	--	**35.0**	--	--	**2.80**	--	--	0.500	U	--	**16.0**	--	--	--	--	--	**0.320**	--	--
YVD-17	YVD-17-160623	6/23/2016	N	59037371	**170**	--	--	**170**	--	--	--	--	--	--	R	MSD	**39.0**	--	--	**3.40**	--	--	0.500	U	--	**18.0**	--	--	--	--	--	**0.550**	--	--
YVD-17	YVD-17-160926	9/26/2016	N	K1611565	**182**	--	--	**182**	--	--	--	--	--	0.050	U	MBK	**40.8**	--	--	**2.91**	--	--	**0.320**	--	--	**17.3**	--	--	--	--	--	**1.16**	--	--
YVD-17	YVD-17-161215	12/15/2016	N	K1615174	**154**	--	--	**157**	J	--	--	--	--	0.050	U	--	**39.6**	--	--	**2.42**	--	--	**0.340**	--	--	**15.8**	--	--	--	--	--	**0.590**	--	--
YVD-17	YVD-031017-29	3/10/2017	N	K1702448	**142**	--	--	**156**	J	--	--	--	--	0.050	U	--	**36.6**	--	--	**2.65**	--	--	**0.330**	--	--	**15.7**	--	--	--	--	--	**0.420**	--	--
YVD-17	YVD-060617-24	6/6/2017	N	K1705754	**167**	--	--	**167**	--	--	--	--	--	0.050	U	--	**40.2**	--	--	**2.40**	--	--	**0.350**	--	--	**15.8**	--	--	--	--	--	**0.500**	--	--
YVD-17	YVD-092517-08	9/25/2017	N	K1710274	**179**	--	--	**179**	--	--	--	--	--	0.050	U	--	**43.1**	--	--	**2.89**	--	--	**0.370**	--	--	**16.4**	--	--	--	--	--	**0.990**	--	--
YVD-17	YVD-120517-26	12/5/2017	N	K1713091	**187**	--	--	**187**	--	--	--	--	--	0.050	U	--	**43.6**	--	--	**2.71**	--	--	**0.390**	--	--	**15.4**	--	--	--	--	--	**0.710**	--	--
YVD-17	YVD-060418-20	6/4/2018	N	874662	**160**	--	--	**160**	--	--	0.090	U	FBK	--	--	--	**39.1**	--	--	**2.87**	--	--	**0.300**	--	--	**16.5**	--	--	--	--	--	**0.660**	--	--
YVD-17	YVD-060219-12	6/2/2019	N	991939	**149**	--	--	**149**	--	--	0.070	U	--	--	--	--	**35.0**	--	--	2.91	U	FBK	0.240	U	FBK	**15.2**	--	--	--	--	--	**0.490**	--	--
YVD-17	YVD-060820-10	6/8/2020	N	009144	**146**	--	--	**146**	--	--	0.070	U	--	--	--	--	**34.4**	--	--	**3.17**	--	--	**0.250**	--	--	**15.2**	--	--	--	--	--	**0.700**	--	--
YVD-17	YVD-060621-04	6/6/2021	N	124053	**144**	--	--	**144**	--	--	0.070	U	--	--	--	--	**33.3**	--	--	**2.36**	J	FDP	**0.190**	--	--	**14.6**	--	--	--	--	--	**0.400**	--	--
YVD-17	YVD-060621-05	6/6/2021	FD	124053	**144**	--	--	**144**	--	--	0.070	U	--	--	--	--	**33.5**	--	--	**2.99**	J	FDP	**0.240**	--	--	**14.7**	--	--	--	--	--	**0.470**	--	--
YVD-17	YVD-060622-14	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**0.610**	--	--
YVD-17	YVD-062023-15	6/20/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**0.62**	J	HTQ
YVD-18	YVD-18-130919	09/19/2013	N	SWI0142	**119**	--	--	**120**	--	--	--	--	--	0.100	U	--	**42.9**	--	--	**61.4**	--	--	5.00	U	--	**13.7**	--	--	--	--	--	--	--	--
YVD-18	YVD-18-130925	09/25/2013	N	SWI0175	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**13.6**	--	--
YVD-18	YVD-18-131211	12/11/2013	N	SWL0073	**109**	--	--	**110**	--	--	--	--	--	0.020	UJ	MSD	**50.4**	--	--	**62.9**	--	--	5.00	U	--	**17.1**	--	--	--	--	--	**14.2**	J	FDP
YVD-18	YVD-D2-131211	12/11/2013	FD	SWL0073	**114**	--	--	**115**	--	--	--	--	--	0.020	UJ	MSD	**50.2**	--	--	**66.5**	--	--	5.00	U	--	**16.7**	--	--	--	--	--	**23.5**	J	FDP
YVD-18	YVD-18-140318	03/18/2014	N	SXC0095	**119**	--	--	**120**	--	--	--	--	--	**0.134**	J	FDP	**51.7**	--	--	**66.7**	--	--	5.00	U	--	**16.5**	--	--	--	--	--	**18.8**	--	--
YVD-18	YVD-D2-140318	03/18/2014	FD	SXC0095	**124**	--	--	**125**	--	--	--	--	--	**0.280**	J	FDP	**52.0**	--	--	**62.1**	--	--	5.00	U	--	**16.6**	--	--	--	--	--	**17.1**	--	--
YVD-18	YVD-18-140603	06/03/2014	N	SXF0017	**117**	--	--	**118**	--	--	--	--	--	0.100	U	--	**46.8**	--	--	**64.0**	--	--	2.00	U	--	**15.4**	--	--	--	--	--	**16.9**	--	--
YVD-18	YVD-18-140923	09/23/2014	N	SXI0173	**114**	--	--	**115**	--	--	--	--	--	0.100	U	--	**48.5**	--	--	**54.7**	--	--	2.50	U	--	**15.6**	--	--	--	--	--	**13.8**	--	--
YVD-18	YVD-18-141216	12/16/2014	N	SXL0121	**114**	--	--	**115**	--	--	--	--	--	0.100	U	--	**52.7**	--	--	**59.6**	--	--	2.50	U	--	**17.7**	--	--	--	--	--	**16.5**	--	--
YVD-18	YVD-18-150317	03/17/2015	N	5904541	**110**	--	--	**110**	--	--	--	--	--	0.100	U	--	**56.0**	--	--	**64.0**	--	--	2.50	U	--	**19.0**	--	--	--	--	--	**20.0**	J--	MSD
YVD-18	YVD-18-150617	06/17/2015	N	59010961	**110**	--	--	**110**	--	--	--	--	--	0.100	U	--	**55.0**	--	--	**65.0**	--	--	2.50	U	--	**18.0**	--	--	--	--	--	**17.0**	--	--
YVD-18	YVD-18-150924	09/24/2015	N	59020391	**120**	--	--	**120**	--	--	--	--	--	0.100	UJ	MSD	**52.0**	--	--	**63.0**	--	--	2.50	U	--	**19.0**	--	--	--	--	--	**20.0**	J+	MSD
YVD-18	YVD-18-151216	12/16/2015	N	59025501	**120**	--	--	**120**	--	--	--	--	--	--	R	MSD	**60.0**	--	--	**66.0**	--	--	2.50	U	--	**20.0**	--	--	--	--	--	**23.0**	--	--
YVD-18	YVD-18-160309	03/09/2016	N	59029941	**120**	--	--	**120**	--	--	--	--	--	0.100	U	--	**62.0**	--	--	**63.0**	--	--	2.50	U	--	**21.0**	--	--	--	--	--	**22.0**	--	--
YVD-18	YVD-18-160622	6/22/2016	N	59037271	**130**	--	--	**130**	--	--	--	--	--	0.100	UJ	MSD	**55.0**	--	--	**61.0**	--	--	2.50	U	--	**19.0**	--	--	--	--	--	**21.0**	--	--
YVD-18	YVD-18-160928	9/28/2016	N	K1611629	**114**	--	--	**114**	--	--	--	--	--	0.050	U	MBK	**58.2**	--	--	**56.8**	--	--	**0.360**	--	--	**19.7**	--	--	--	--	--	**20.5**	--	--
YVD-18	YVD-18-161214	12/14/2016	N	K1615083	**111**	--	--	**111**	--	--	--	--	--	0.050	U	--	**62.5**	--	--	**56.3**	--	--	**0.380**	--	--	**19.6**	--	--	--	--	--	**21.5**	--	--
YVD-18	YVD-D3-161214	12/14/2016	FD	K1615083	**111**	--	--	**111**	--	--	--	--	--	**0.115**	--	--	**60.6**	--	--	**56.4**	--	--	**0.370**	--	--	**20.1**	--	--	--	--	--	**21.5**	--	--
YVD-18	YVD-030617-05	3/6/2017	N	K1702324	**110**	--	--	**110**	--	--	--	--	--	1.00	U	--	**65.4**	--	--	**55.9**	--	--	**0.400**	--	--	**20.5**	--	--	--	--	--	**23.7**	J	HTQ
YVD-18	YVD-060717-31	6/7/2017	N	K1705833	**114**	--	--	**114**	--	--	--	--	--	0.050	U	--	**65.2**	--	--	**57.0**	--	--	**0.340**	--	--	**21.4**	--	--	--	--	--	**22.9**	--	--
YVD-18	YVD-092617-27	9/26/2017	N	K1710333	**115**	--	--	**115**	--	--	--	--	--	0.050	U	--	**58.5**	--	--	**54.8**	--	--	**0.380**	--	--	**18.3**	--	--	--	--	--	**21.6**	--	--
YVD-18	YVD-120417-05	12/4/2017	N	K1713026	**114**	--	--	**114**	--	--	--	--	--	0.050	U	--	**62.6**	--	--	**58.9**	--	--	**0.400**	--	--	**20.0**	--	--	--	--	--	**24.4**	--	--
YVD-18	YVD-031918-17	3/19/2018	N	870634	**111**	--	--	**111**	--	--	0.070	U	--	--	--	--	**67.5**	--	--	**68.2**	--	--	**0.340**	--	--	**22.0**	--	--	--	--	--	**27.7**	--	--
YVD-18	YVD-060318-07	6/3/2018	N	874568	**110**	--	--	**110**	--	--	0.070	U	--	--	--	--	**70.0**	--	--	**65.9**	--	--	**0.330**	--	--	**23.3**	--	--	--	--	--	**26.3**	--	--
YVD-18	YVD-090918-12	9/9/2018	N	880601	**112**	--	--	**112**	--	--	0.070	U	--	--	--	--	**67.5**	--	--	**67.1**	--	--	**0.350**	--	--	**22.1**	--	--	--	--	--	**26.0**	--	--
YVD-18	YVD-121018-09	12/10/2018	N	884857	**115**	--	--	**115**	--	--	0.070	U	--	--	--	--	**68.0**	--	--	**66.8**	--	--	0.320	U	FBK	**22.0**	J	MSD	--	--	--	**27.0**	--	--
YVD-18	YVD-031819-13	3/18/2019	N	988273	**118**	--	--	**118**	--	--	0.070	U	--	--	--	--	**75.0**	--	--	**74.5**	--	--	**0.730**	--	--	**23.7**	--	--	--	--	--	**29.8**	--	--
YVD-18	YVD-060319-23	6/3/2019	N	992053	**118**	--	--	**118**	--	--	0.070	U	--	--	--	--	**75.0**	--	--	**71.0**	--	--	**0.250**	--	--	**23.4**	--	--	--	--	--	**28.4**	--	--
YVD-18	YVD-090919-06	9/9/2019	N	998357	**115**	--	--	**115**	--	--	0.070	U	--	--	--	--	**65.0**	--	--	**61.5**	--	--	**0.380**	--	--	**20.7**	--	--	--	--	--	**28.4**	--	--
YVD-18	YVD-090919-08	9/9/2019	FD	998357	**114**	--	--	**114**	--	--	0.070	U	--	--	--	--	**65.5**	--	--	**60.9**	--	--	**0.380**	--	--	**20.8**	--	--	--	--	--	**28.3**	--	--
YVD-18	YVD-120919-08	12/9/2019	N	902276	**113**			**113**			0.070	U		--	--	--	**70.0**			**68.1**			**0.340**			**23.0**			--	--	--	**28.8**		
YVD-18	YVD-033020-07	3/30/2020	N	006241	**117**	--	--	**117**	--	--	0.070	U	--	--	--	--	**73.5**	--	--	**71.6**	--	--	**0.300**	--	--	**23.3**	--	--	--	--	--	**28.5**	--	--
YVD-18	YVD-060920-19	6/9/2020	N	009269	**120**	--	--	**120**	--	--	0.070	U	--	--	--	--	**70.5**	--	--	**69.1**	--	--	**0.290**	--	--	**22.5**	--	--	--	--	--	**27.4**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-18	YVD-092120-15	9/21/2020	N	013896	**115**	--	--	**115**	--	--	0.070	U	--	--	--	--	**67.0**	--	--	**70.9**	--	--	**0.310**	--	--	**21.6**	--	--	--	--	--	**27.4**	--	--
YVD-18	YVD-092120-17	9/21/2020	FD	013896	**113**	--	--	**113**	--	--	0.070	U	--	--	--	--	**65.5**	--	--	**70.4**	--	--	**0.310**	--	--	**21.2**	--	--	--	--	--	**27.2**	--	--
YVD-18	YVD-120820-15	12/8/2020	N	017137	**116**	--	--	**116**	--	--	0.070	U	--	--	--	--	**71.0**	--	--	**64.8**	--	--	**0.420**	--	--	**22.7**	--	--	--	--	--	**26.6**	--	--
YVD-18	YVD-030221-17	3/2/2021	N	120034	**122**	--	--	**122**	--	--	0.070	U	--	--	--	--	**76.0**	--	--	**72.2**	--	--	**0.310**	--	--	**23.7**	--	--	--	--	--	**28.2**	--	--
YVD-18	YVD-060821-30	6/8/2021	N	124212	**120**	--	--	**120**	--	--	0.070	U	--	--	--	--	**71.0**	--	--	**75.8**	--	--	**0.310**	--	--	**22.8**	--	--	--	--	--	**31.8**	--	--
YVD-18	YVD-121521-12	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**26.6**	J	HTQ, MC, MS
YVD-18	YVD-121521-14	12/15/2021	FD	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**26.7**	J	HTQ, MC, MS
YVD-18	YVD-031522-18	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**30.0**	--	--
YVD-18	YVD-060722-25	6/7/2022	N	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**30.9**	J	HTQ
YVD-18	YVD-060722-26	6/7/2022	FD	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**30.5**	J	HTQ
YVD-18	YVD-091322-13	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**27.6**	--	--
YVD-18	YVD-122722-16	12/27/2022	N	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**28.1**	--	--
YVD-18	YVD-122722-17	12/27/2022	FD	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**28.6**	--	--
YVD-18	YVD-030623-11	3/6/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**33.1**	--	--	--	--	--
YVD-18	YVD-062023-16	6/20/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**32.1**	J	HTQ
Equipment Blank	YVD-EB-130918	09/18/2013	EB	SWI0123	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Equipment Blank	YVD-EB-130925	09/25/2013	EB	SWI0175	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Equipment Blank	YVD-EB-131212	12/12/2013	EB	SWL0078	4.00	U	--	4.00	U	--	0.020	U	--	0.020	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Equipment Blank	YVD-EB-140317	03/17/2014	EB	SXC0081	4.00	U	--	4.00	U	--	**0.124**	--	--	**0.124**	--	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Equipment Blank	YVD-EB-140318	03/18/2014	EB	SXC0095	4.00	U	--	4.00	U	--	**0.130**	--	--	**0.130**	--	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Equipment Blank	YVD-EB-140319	03/19/2014	EB	SXC0107	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Equipment Blank	YVD-EB-140604	06/04/2014	EB	SXF0025	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	**1.46**	--	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Equipment Blank	YVD-EB-140924	09/24/2014	EB	SXI0173	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Equipment Blank	YVD-EB-141217	12/17/2014	EB	SXL0144	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	**0.900**	--	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Equipment Blank	YVD-EB-150617	06/17/2015	EB	59011021	**5.00**	--	--	**5.00**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Equipment Blank	YVD-EB-150925	09/25/2015	EB	59020431	4.00	U	--	4.00	U	--	**0.100**	--	--	**0.100**	--	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Equipment Blank	YVD-EB-151216	12/16/2015	EB	59025501	**5.00**	--	--	**5.00**	--	--	**0.120**	J--	MSD	**0.120**	J--	MSD	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Equipment Blank	YVD-EB-160310	03/10/2016	EB	59029941	**15.0**	--	--	**15.0**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	**1.10**	--	--	**0.670**	--	--	0.500	U	--	--	--	--	0.200	U	--
Equipment Blank	YVD-EB-160623	6/23/2016	EB	59037371	**5.00**	--	--	**5.00**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Equipment Blank	YVD-EB-160926	9/26/2016	EB	K1611506	2.00	U	--	2.00	U	--	0.050	U	MBK	0.050	U	MBK	**0.097**	--	--	0.200	U	--	0.200	U	--	**0.035**	--	--	--	--	--	0.100	U	--
Equipment Blank	YVD-EB-160927	9/27/2016	EB	K1611629	2.00	U	--	2.00	U	--	0.050	U	MBK	0.050	U	MBK	**0.011**	J	--	0.100	U	--	0.100	U	--	**0.000**	J	--	--	--	--	0.050	UJ	HTQ
Equipment Blank	YVD-EB-160928	9/28/2016	EB	K1611629	2.00	U	--	2.00	U	--	0.050	U	MBK	0.050	U	MBK	**0.050**	J	--	**0.030**	J	--	0.100	U	--	0.050	U	--	--	--	--	0.050	U	--
Equipment Blank	YVD-EB1-161214	12/14/2016	EB	K1615083	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Equipment Blank	YVD-EB2-161215	12/15/2016	EB	K1615126	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Equipment Blank	YVD-EB3-161216	12/16/2016	EB	K1615174	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.035	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
Field Blank	YVD-F1-130916	09/16/2013	FB	SWI0113	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F2-130917	09/17/2013	FB	SWI0113	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F3-130918	09/18/2013	FB	SWI0123	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F4-130918	09/18/2013	FB	SWI0138	4.00	U	--	4.00	U	--	**0.120**	--	--	**0.120**	--	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F5-130919	09/19/2013	FB	SWI0142	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	--	--	--
Field Blank	YVD-F6-130923	09/23/2013	FB	SWI0178	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	--	--	--	--	--	--	0.500	U	--	--	--	--	--	--	--
Field Blank	YVD-F7-130924	09/24/2013	FB	SWI0175	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F7-130926	09/26/2013	FB	SWI0190	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.800	U	--	0.500	U	--	--	--	--	--	--	--	0.200	U	--
Field Blank	YVD-F1-131209	12/09/2013	FB	SWL0055	4.00	U	--	4.00	U	--	0.020	U	--	0.020	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F2-131210	12/10/2013	FB	SWL0063	4.00	U	--	4.00	U	--	0.020	U	--	0.020	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F3-131211	12/11/2013	FB	SWL0073	4.00	U	--	4.00	U	--	0.020	U	--	0.020	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F4-131212	12/12/2013	FB	SWL0078	4.00	U	--	4.00	U	--	0.020	U	--	0.020	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F1-140316	03/16/2014	FB	SXC0081	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F2-140317	03/17/2014	FB	SXC0095	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F3-140318	03/18/2014	FB	SXC0107	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F4-140319	03/19/2014	FB	SXC0107	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F1-140601	06/01/2014	FB	SXF0008	**4.25**	--	--	**4.25**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F2-140602	06/02/2014	FB	SXF0017	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F3-140603	06/03/2014	FB	SXF0025	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F1-140921	09/21/2014	FB	SXI0148	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F2-140922	09/22/2014	FB	SXI0148	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F3-140923	09/23/2014	FB	SXI0158	4.00	U	--	4.00	U	--	**0.128**	--	--	**0.128**	--	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F4-140924	09/24/2014	FB	SXI0173	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F1-141215	12/15/2014	FB	SXL0103	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	UJ	DUP
Field Blank	YVD-F2-141215	12/15/2014	FB	SXL0108	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F3-141216	12/16/2014	FB	SXL0121	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F4-141217	12/17/2014	FB	SXL0144	4.00	U	--	4.00	U	--	**0.101**	--	--	**0.101**	--	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	--	R	HTQ
Field Blank	YVD-F1-150315	03/15/2015	FB	5904471	**15.0**	--	--	**15.0**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F2-150316	03/16/2015	FB	5904541	**7.50**	--	--	**7.50**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F3-150317	03/17/2015	FB	5904651	**4.50**	--	--	**4.50**	--	--	0.100	U	--	0.100	U	--	**1.20**	--	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F1-150615	06/15/2015	FB	59010751	**10.0**	--	--	**10.0**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F2-150616	06/16/2015	FB	59010961	**5.00**	--	--	**5.00**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F3-150617	06/17/2015	FB	59011021	**5.00**	--	--	**5.00**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F1-150922	09/22/2015	FB	59020141	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F2-150923	09/23/2015	FB	59020281	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F3-150923	09/23/2015	FB	59020391	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F4-150924	09/24/2015	FB	59020391	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F5-150925	09/25/2015	FB	59020431	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F1-151213	12/13/2015	FB	59025351	**5.00**	--	--	**5.00**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F2-151214	12/14/2015	FB	59025431	**5.00**	--	--	**5.00**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F3-151215	12/15/2015	FB	59025501	**5.00**	--	--	**5.00**	--	--	--	R	MSD	--	R	MSD	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F4-151216	12/16/2015	FB	59025501	**5.00**	--	--	**5.00**	--	--	--	R	MSD	--	R	MSD	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F1-160307	03/07/2016	FB	59029521	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F2-160308	03/08/2016	FB	59029711	4.00	U	--	4.00	U	--	**0.190**	--	--	**0.190**	--	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F3-160309	03/09/2016	FB	59029941	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F4-160310	03/10/2016	FB	59029941	**13.0**	--	--	**13.0**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F1-160620	6/20/2016	FB	59037101	**5.00**	--	--	**5.00**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F2-160621	6/21/2016	FB	59037151	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F3-160622	6/22/2016	FB	59037271	**5.00**	--	--	**5.00**	--	--	**0.220**	--	--	**0.220**	--	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F4-160623	6/23/2016	FB	59037371	**10.0**	--	--	**10.0**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
Field Blank	YVD-FB-160926	9/26/2016	FB	K1611506	2.00	U	--	2.00	U	--	0.050	U	MBK	0.050	U	MBK	0.020	U	MBK	0.200	U	--	0.200	U	--	**0.003**	J	--	--	--	--	0.100	U	--
Field Blank	YVD-FB-160927	9/27/2016	FB	K1611565	2.00	U	--	2.00	U	--	0.050	U	MBK	0.050	U	MBK	0.020	U	MBK	0.200	U	--	0.200	U	--	0.050	U	--	--	--	--	0.100	U	--
Field Blank	YVD-FB-160928	9/28/2016	FB	K1611629	15.0	U	--	15.0	U	--	0.050	U	MBK	0.050	U	MBK	**0.050**	J	--	0.100	U	--	0.100	U	--	0.050	U	--	--	--	--	0.050	U	--
Field Blank	YVD-FB-160929	9/29/2016	FB	K1611698	2.00	U	--	2.00	U	--	0.050	U	MBK	0.050	U	MBK	**0.070**	J	--	0.200	U	--	0.200	U	--	0.050	U	--	--	--	--	0.100	U	--
Field Blank	YVD-FB1-161212	12/12/2016	FB	K1615029	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	HTQ
Field Blank	YVD-FB2-161213	12/13/2016	FB	K1615045	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-FB3-161214	12/14/2016	FB	K1615083	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	--	--	--	--	0.100	U	--
Field Blank	YVD-FB4-161215	12/15/2016	FB	K1615126	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-FB5-161216	12/16/2016	FB	K1615174	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-030617-01	3/6/2017	FB	K1702228	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-030717-06	3/7/2017	FB	K1702324	2.00	U	--	2.00	U	--	1.00	U	--	1.00	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	UJ	HTQ
Field Blank	YVD-030817-11	3/8/2017	FB	K1702324	2.00	U	--	2.00	U	--	1.00	U	--	1.00	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-030917-17	3/9/2017	FB	K1702404	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-031017-26	3/10/2017	FB	K1702448	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-031317-30	3/13/2017	FB	K1702489	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-060417-01	6/4/2017	FB	K1705702	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.025	U	MBK	21.000	U	--	0.200	U	--	0.005	U	MBK	--	--	--	5.30	U	--
Field Blank	YVD-060517-07	6/5/2017	FB	K1705702	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.029	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-060617-17	6/6/2017	FB	K1705754	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-060717-28	6/7/2017	FB	K1705833	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-092517-01	9/25/2017	FB	K1710274	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	**0.002**	J	--	--	--	--	0.100	U	--
Field Blank	YVD-092617-16	9/26/2017	FB	K1710333	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.026	U	MBK	0.200	U	--	0.200	U	--	0.008	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-120417-01	12/4/2017	FB	K1713026	15.0	U	MBK	15.0	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-120517-32	12/5/2017	FB	K1713091	15.0	U	MBK	15.0	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	**0.420**	--	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	HTQ
Field Blank	YVD-120617-25	12/6/2017	FB	K1713157	15.0	U	MBK	15.0	U	--	0.050	U	MBK	0.050	U	MBK	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-031818-01	3/18/2018	FB	870610	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-031918-10	3/19/2018	FB	870634	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-060318-01	6/3/2018	FB	874568	5.00	U	--	5.00	U	--	**0.180**	--	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-060418-12	6/4/2018	FB	874568	5.00	U	--	5.00	U	--	**0.080**	--	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-060518-26	6/5/2018	FB	874860	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-061218-33	6/12/2018	FB	875438	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-090918-01	9/9/2018	FB	880601	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-121018-01	12/10/2018	FB	884857	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	**0.280**	--	--	**0.100**	--	--	0.060	UJ	MSD	--	--	--	0.050	U	--
Field Blank	YVD-121118-12	12/11/2018	FB	884939	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	**0.140**	--	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-031719-01	3/17/2019	FB	988239	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	**0.220**	--	--	0.120	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-031819-11	3/18/2019	FB	988273	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-032019-20	3/20/2019	FB	988477	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-060219-01	6/2/2019	FB	991939	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	**11.0**	--	--	**0.630**	--	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-060319-13	6/3/2019	FB	992053	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	**0.310**	--	--	0.100	U	--	0.060	U	--	--	--	--	**0.080**	--	--
Field Blank	YVD-060419-26	6/4/2019	FB	992242	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-090919-01	9/9/2019	FB	998357	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-090919-03	9/9/2019	FB	998357	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-091019-15	9/10/2019	FB	998438	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-091019-17	9/10/2019	FB	998438	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-120919-01	12/9/2019	FB	902276	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-120919-09	12/9/2019	FB	902276	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-121019-16	12/10/2019	FB	902321	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-121019-18	12/10/2019	FB	902321	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-033020-01	3/30/2020	FB	006241	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-033020-03	3/30/2020	FB	006241	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-033120-13	3/31/2020	FB	006260	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
Field Blank	YVD-033120-15	3/31/2020	FB	006260	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-060820-01	6/8/2020	FB	009144	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-060820-02	6/8/2020	FB	009144	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-060920-11	6/9/2020	FB	009269	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-060920-13	6/9/2020	FB	009269	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-061020-29	6/10/2020	FB	009361	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-061020-28	6/10/2020	FB	009361	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-092020-01	9/20/2020	FB	013864	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-092020-02	9/20/2020	FB	013864	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-092120-10	9/21/2020	FB	013896	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-092120-12	9/21/2020	FB	013896	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-120720-01	12/7/2020	FB	017035	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-120720-03	12/7/2020	FB	017035	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-120820-16	12/8/2020	FB	017137	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-120820-18	12/8/2020	FB	017137	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-030121-01	3/1/2021	FB	119931	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-030121-03	3/1/2021	FB	119931	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-030221-11	3/2/2021	FB	120034	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-030221-13	3/2/2021	FB	120034	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-060621-01	6/6/2021	FB	124053	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-060621-02	6/6/2021	FB	124053	--	--	--	--	--	--	0.070	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-060721-11	6/7/2021	FB	124105	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-060721-12	6/7/2021	FB	124105	--	--	--	--	--	--	0.070	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-060821-20	6/8/2021	FB	124212	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-060821-21	6/8/2021	FB	124212	--	--	--	--	--	--	0.070	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-121421-01	12/14/2021	FB	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.100	U	--
Field Blank	YVD-121521-13	12/15/2021	FB	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.100	UJ	ERL
Field Blank	YVD-031422-01	3/14/2022	FB	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.050	UJ	ERL
Field Blank	YVD-031522-09	3/15/2022	FB	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.050	U	--
Field Blank	YVD-060522-01	6/5/2022	FB	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.100	U	--
Field Blank	YVD-060622-13	6/6/2022	FB	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.100	U	--
Field Blank	YVD-060722-23	6/7/2022	FB	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.100	UJ	HTQ
Field Blank	YVD-060822-33	6/8/2022	FB	K2206299	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.250	U	--
Field Blank	YVD-091322-01	9/13/2022	FB	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.100	U	--
Field Blank	YVD-091422-14	9/14/2022	FB	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.100	U	--
FieldQC	YVD-120622-01	12/6/2022	FB	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.100	U	--
FieldQC	YVD-120722-08	12/7/2022	FB	K2214479	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.100	U	--
FieldQC	YVD-120822-12	12/8/2022	FB	K2214578	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.100	U	MBK
FieldQC	YVD-122722-22	12/27/2022	FB	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.100	U	--
FieldQC	YVD-030523-01	3/5/2023	FB	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.050	U	--	--	--	--
FieldQC	YVD-030623-07	3/6/2023	FB	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.050	U	--	--	--	--
FieldQC	YVD-061923-01	6/19/2023	FB	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.10	UJ	HTQ
FieldQC	YVD-062023-05	6/20/2023	FB	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.10	UJ	HTQ
FieldQC	YVD-062123-21	6/21/2023	FB	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.10	UJ	HTQ
Blank Check	WW-1	4/25/2016	BC	59032861	**110**	--	--	**110**	--	--	**0.330**	--	--	**0.330**	--	--	1.70	U	--	160	U	--	100	U	--	0.830	U	--	--	--	--	40.0	U	--
Blank Check	DW-1	4/25/2016	BC	59032861	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Blank Check	DI-1	4/25/2016	BC	59032861	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-01	DC-01-130104	01/04/2013	N	EPA01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-01	DC-01-130924	09/24/2013	N	SWI0178	0.200	U	--	0.250	U	--	--	--	--	--	--	--	**0.123**	--	--	--	--	--	**6.10**	--	--	**43.0**	--	--	**223**	--	--
DC-01	DC-01-131211	12/11/2013	N	SWL0063	2.00	U	--	0.200	U	--	--	--	--	--	--	--	--	--	--	**0.186**	--	--	**5.94**	--	--	**41.9**	--	--	**280**	J--	MSD
DC-01	DC-01-140318	03/18/2014	N	SXC0095	2.00	U	--	**0.304**	--	--	**0.079**	--	--	--	--	--	--	--	--	--	--	--	**5.93**	--	--	**40.2**	--	--	**250**	J--	MSD
DC-01	DC-01-140602	06/02/2014	N	SXF0017	0.800	U	--	**0.450**	--	--	**0.810**	--	--	--	--	--	--	--	--	--	--	--	**6.74**	--	--	**41.8**	--	--	**224**	J--	MSD
DC-01	DC-01-140923	09/23/2014	N	SXI0158	2.00	U	--	0.250	U	--	**0.120**	--	--	--	--	--	--	--	--	--	--	--	**6.02**	--	--	**44.3**	J+	MSD	**216**	--	--
DC-01	DC-01-141216	12/16/2014	N	SXL0121	2.00	U	--	0.250	UJ	MSD	0.100	U	--	--	--	--	--	--	--	--	--	--	**6.18**	--	--	**43.1**	--	--	**463**	--	--
DC-01	DC-01-150316	03/16/2015	N	5904471	2.00	U	--	0.250	UJ	MSD	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**6.50**	--	--	**44.0**	--	--	**220**	--	--
DC-01	DC-01-150616	06/16/2015	N	59010751	2.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**6.20**	J+	MSD	**42.0**	J+	MSD	**200**	J--	MSD
DC-01	DC-01-150923	09/23/2015	N	59020281	2.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**6.00**	--	--	**43.0**	--	--	**200**	--	--
DC-01	YVD-D1-150923	09/23/2015	FD	59020281	0.200	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**6.10**	--	--	**43.0**	--	--	**210**	--	--
DC-01	DC-01-151214	12/14/2015	N	59025431	2.00	U	--	--	R	MSD	**0.300**	J	FDP	--	--	--	--	--	--	--	--	--	**6.80**	--	--	**48.0**	--	--	**220**	--	--
DC-01	DC-01-160308	03/08/2016	N	59029711	2.00	U	--	--	R	MSD	**0.260**	--	--	--	--	--	--	--	--	--	--	--	**6.20**	--	--	**42.0**	--	--	**210**	J+	MSD
DC-01	DC-01-160620	6/20/2016	N	59037101	2.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**6.50**	--	--	**46.0**	--	--	**220**	J--	MSD
DC-01	DC-01-160928	9/28/2016	N	K1611629	0.100	U	--	0.500	U	--	--	--	--	**0.009**	J	--	--	--	--	--	--	--	**5.76**	--	--	**41.6**	--	--	**193**	--	--
DC-01	DC-01-161212	12/12/2016	N	K1615045	0.100	UJ	HTQ	0.500	U	--	--	--	--	**0.040**	--	--	--	--	--	--	--	--	**5.52**	--	--	**40.4**	--	--	**191**	--	--
DC-01	YVD-030817-18	3/8/2017	N	K1702324	0.100	U	--	0.500	U	--	--	--	--	**0.008**	J	--	--	--	--	--	--	--	**5.13**	--	--	**37.4**	--	--	**175**	--	--
DC-01	YVD-060417-03	6/4/2017	N	K1705702	0.100	U	--	0.500	U	--	--	--	--	**0.010**	J	--	--	--	--	--	--	--	**5.22**	--	--	**37.4**	--	--	**203**	--	--
DC-01	YVD-060417-05	6/4/2017	FD	K1705702	0.100	U	--	0.500	U	--	--	--	--	**0.010**	J	--	--	--	--	--	--	--	**5.08**	--	--	**36.9**	--	--	**203**	--	--
DC-01	YVD-092517-13	9/25/2017	N	K1710333	0.100	U	--	0.500	U	--	--	--	--	0.010	U	--	--	--	--	--	--	--	**5.31**	--	--	**39.1**	--	--	**194**	--	--
DC-01	YVD-120617-31	12/6/2017	N	K1713157	0.100	U	--	0.500	U	--	--	--	--	**0.010**	--	--	--	--	--	--	--	--	**5.56**	--	--	**40.6**	--	--	**182**	--	--
DC-01	YVD-060418-19	6/4/2018	N	874662	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.80**	--	--	**42.4**	--	--	**171**	--	--
DC-01	YVD-060219-03	6/2/2019	N	991939	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.50**	--	--	**39.0**	--	--	**168**	--	--
DC-01	YVD-060820-07	6/8/2020	N	009144	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	**0.160**	--	--	**5.80**	--	--	**40.7**	--	--	**164**	--	--
DC-01	YVD-060721-10	6/7/2021	N	124105	0.050	U	--	5.00	UJ	MS, RPD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.30**	--	--	**36.4**	--	--	**136**	--	--
DC-01	YVD-060622-15	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-01	YVD-061923-02	6/19/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03	DC-03-130102	01/02/2013	N	EPA01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03	DC-03-130918	09/18/2013	N	SWI0138	2.00	U	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	**2.73**	--	--	**173**	--	--	**176**	--	--
DC-03	DC-03-131212	12/12/2013	N	SWL0078	2.00	U	--	0.200	U	--	--	--	--	--	--	--	--	--	--	**0.221**	--	--	**3.29**	--	--	**172**	--	--	**176**	--	--
DC-03	YVD-D3-131212	12/12/2013	FD	SWL0078	2.00	U	--	0.831	U	ERL	--	--	--	--	--	--	--	--	--	**0.244**	--	--	**3.53**	--	--	**181**	--	--	**160**	--	--
DC-03	DC-03-140319	03/19/2014	N	SXC0107	2.00	U	--	**0.938**	J--	MSD	**0.057**	--	--	--	--	--	--	--	--	--	--	--	**2.91**	--	--	**165**	--	--	**189**	J	FDP
DC-03	YVD-D3-140319	03/19/2014	FD	SXC0107	2.00	U	--	**0.718**	J--	MSD	**0.062**	--	--	--	--	--	--	--	--	--	--	--	**2.81**	--	--	**166**	--	--	**150**	J	FDP
DC-03	DC-03-140604	06/04/2014	N	SXF0025	4.00	U	--	0.250	UJ	MSD	**0.120**	--	--	--	--	--	--	--	--	--	--	--	**3.11**	--	--	**177**	--	--	**214**	--	--
DC-03	DC-03-140924	09/24/2014	N	SXI0173	2.00	U	--	**2.27**	J+	MSD	**0.073**	J+	FBK	--	--	--	--	--	--	--	--	--	**3.28**	--	--	**178**	--	--	**166**	--	--
DC-03	DC-03-141217	12/17/2014	N	SXL0144	4.00	U	--	--	R	MSD	0.100	UJ	MSD	--	--	--	--	--	--	--	--	--	**3.76**	--	--	**185**	--	--	**182**	--	--
DC-03	YVD-D4-141217	12/17/2014	FD	SXL0144	10.0	U	--	--	R	MSD	**0.130**	J--	MSD	--	--	--	--	--	--	--	--	--	**3.19**	--	--	**180**	--	--	**211**	--	--
DC-03	DC-03-150318	03/18/2015	N	5904651	2.00	U	--	**0.450**	J--	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.30**	J--	MSD	**180**	--	--	**160**	--	--
DC-03	YVD-D4-150318	03/18/2015	FD	5904651	1.00	U	--	**0.530**	J--	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.60**	J--	MSD	**180**	--	--	**160**	--	--
DC-03	DC-03-150617	06/17/2015	N	59011021	2.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.60**	J	RPD	**190**	J	RPD	**170**	--	--
DC-03	YVD-D4-150617	06/17/2015	FD	59011021	2.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.60**	J	RPD	**190**	J	RPD	**180**	--	--
DC-03	DC-03-150925	09/25/2015	N	59020431	4.00	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.30**	--	--	**180**	--	--	**150**	--	--
DC-03	YVD-D4-150925	09/25/2015	FD	59020431	4.00	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.20**	--	--	**180**	--	--	**160**	--	--
DC-03	DC-03-151216	12/16/2015	N	59025501	2.00	U	--	--	R	MSD	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**3.50**	--	--	**160**	--	--	**130**	--	--
DC-03	YVD-D4-151216	12/16/2015	FD	59025501	1.00	U	--	--	R	MSD	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**3.50**	--	--	**160**	--	--	**130**	--	--
DC-03	DC-03-160310	03/10/2016	N	59029941	2.00	U	--	**0.940**	J--	FDP, MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.10**	--	--	**180**	--	--	**170**	J	DUP
DC-03	YVD-D4-160310	03/10/2016	FD	59029941	2.00	U	--	0.250	UJ	FDP, MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.00**	--	--	**180**	--	--	**180**	J	DUP
DC-03	DC-03-160623	6/23/2016	N	59037371	2.00	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.50**	--	--	**190**	--	--	**160**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-03	YVD-D4-160623	6/23/2016	FD	59037371	1.00	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.30**	--	--	**180**	--	--	**160**	--	--
DC-03	DC-03-160927	9/27/2016	N	K1611565	0.100	U	--	--	R	MSD	--	--	--	**0.006**	J	--	--	--	--	--	--	--	**2.85**	--	--	**182**	--	--	**139**	--	--
DC-03	DC-03-D2-160927	9/27/2016	FD	K1611565	0.100	U	--	--	R	MSD	--	--	--	0.010	U	--	--	--	--	--	--	--	**2.87**	--	--	**183**	--	--	**138**	--	--
DC-03	DC-03-161212	12/12/2016	N	K1615029	0.100	U	--	0.500	U	--	--	--	--	**0.199**	--	--	--	--	--	--	--	--	**3.05**	--	--	**167**	--	--	**112**	--	--
DC-03	YVD-030817-13	3/8/2017	N	K1702324	**0.120**	--	--	0.500	U	--	--	--	--	**0.006**	J	--	--	--	--	--	--	--	**2.58**	--	--	**159**	--	--	**104**	--	--
DC-03	YVD-060517-02	6/5/2017	N	K1705702	0.100	U	--	0.500	U	--	--	--	--	**0.022**	--	--	--	--	--	--	--	--	**2.49**	--	--	**157**	--	--	**147**	--	--
DC-03	YVD-060517-04	6/5/2017	FD	K1705702	0.100	U	--	0.500	U	--	--	--	--	**0.019**	--	--	--	--	--	--	--	--	**2.49**	--	--	**158**	--	--	**122**	--	--
DC-03	YVD-092617-22	9/26/2017	N	K1710333	0.100	U	--	0.500	U	--	--	--	--	**0.010**	J	--	--	--	--	--	--	--	**2.92**	--	--	**159**	--	--	**115**	--	--
DC-03	YVD-120417-10	12/4/2017	N	K1713026	0.100	U	--	0.500	U	--	--	--	--	0.017	U	MBK	--	--	--	--	--	--	**2.76**	--	--	**161**	--	--	**108**	--	--
DC-03	YVD-031818-04	3/18/2018	N	870610	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.01**	--	--	**180**	--	--	**111**	--	--
DC-03	YVD-060418-22	6/4/2018	N	874860	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.34**	--	--	**174**	--	--	**108**	--	--
DC-03	YVD-090918-17	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.82**	--	--	**160**	--	--	**136**	--	--
DC-03	YVD-121018-03	12/10/2018	N	884857	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.24**	--	--	**170**	--	--	**134**	--	--
DC-03	YVD-031819-19	3/18/2019	N	988273	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.19**	--	--	**178**	--	--	**148**	--	--
DC-03	YVD-060419-32	6/4/2019	N	992242	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.02**	--	--	**172**	--	--	**152**	--	--
DC-03	YVD-091019-23	9/10/2019	N	998438	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.06**	--	--	**159**	--	--	**154**	--	--
DC-03	YVD-121019-22	12/10/2019	N	902321	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.60**	--	--	**164**	--	--	**156**	--	--
DC-03	YVD-033120-22	3/31/2020	N	006260	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.14**	--	--	**168**	--	--	**146**	--	--
DC-03	YVD-060920-26	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS										0.070	U	--	**3.30**	--	--	**174**	--	--	**161**	--	--
DC-03	YVD-092120-21	9/21/2020	N	013896	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.06**	--	--	**160**	--	--	**166**	--	--
DC-03	YVD-120720-05	12/7/2020	N	017035	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.58**	--	--	**170**	--	--	**160**	--	--
DC-03	YVD-120720-07	12/7/2020	FD	017035	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.66**	--	--	**166**	--	--	**161**	--	--
DC-03	YVD-030221-23	3/2/2021	N	120034	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.22**	--	--	**166**	--	--	**154**	--	--
DC-03	YVD-060821-27	6/8/2021	N	124212	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.07**	--	--	**160**	--	--	**162**	--	--
DC-03	YVD-031522-10	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03	YVD-031522-11	3/15/2022	FD	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03	YVD-060522-10	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03	YVD-091322-12	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03	YVD-122722-21	12/27/2022	N	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03	YVD-030623-15	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03	YVD-062023-20	6/20/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03D	DC-03D-130918	09/18/2013	N	SWI0138	2.00	U	--	**0.255**	--	--	--	--	--	--	--	--	0.100	U	--	--	--	--	**2.71**	--	--	**62.1**	--	--	**101**	--	--
DC-03D	DC-03D-131212	12/12/2013	N	SWL0073	2.00	U	--	0.200	UJ	MSD	--	--	--	--	--	--	--	--	--	0.060	U	--	**2.67**	--	--	**59.7**	--	--	**99.1**	--	--
DC-03D	DC-03D-140319	03/19/2014	N	SXC0107	2.00	U	--	**0.427**	J--	MSD	0.050	U	--	--	--	--	--	--	--	--	--	--	**2.67**	--	--	**57.5**	--	--	**106**	--	--
DC-03D	DC-03D-140603	06/03/2014	N	SXF0017	0.800	U	--	**0.468**	--	--	**0.074**	J+	FBK	--	--	--	--	--	--	--	--	--	**2.66**	--	--	**59.0**	--	--	**103**	J--	MSD
DC-03D	DC-03D-140923	09/23/2014	N	SXI0173	1.00	U	--	0.250	U	--	**0.098**	--	--	--	--	--	--	--	--	--	--	--	**3.40**	--	--	**67.8**	--	--	**89.4**	--	--
DC-03D	DC-03D-141217	12/17/2014	N	SXL0121	1.00	U	--	**0.282**	J--	MSD	0.100	U	--	--	--	--	--	--	--	--	--	--	**2.92**	--	--	**60.7**	--	--	**92.2**	--	--
DC-03D	DC-03D-150317	03/17/2015	N	5904651	1.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.00**	J--	MSD	**68.0**	--	--	**87.0**	--	--
DC-03D	DC-03D-150617	06/17/2015	N	59011021	1.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.20**	J	RPD	**68.0**	J	RPD	**93.0**	--	--
DC-03D	DC-03D-150925	09/25/2015	N	59020431	4.00	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.00**	--	--	**65.0**	--	--	**86.0**	--	--
DC-03D	DC-03D-151216	12/16/2015	N	59025501	1.00	U	--	--	R	MSD	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**3.20**	--	--	**69.0**	--	--	**94.0**	--	--
DC-03D	DC-03D-160310	03/10/2016	N	59029941	1.00	U	--	0.250	UJ	FDP, MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.00**	--	--	**68.0**	--	--	**90.0**	J	DUP
DC-03D	DC-03D-160623	6/23/2016	N	59037371	2.00	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.00**	--	--	**70.0**	--	--	**89.0**	--	--
DC-03D	DC-03D-160927	9/27/2016	N	K1611565	0.100	U	--	--	R	MSD	--	--	--	**0.006**	J	--	--	--	--	--	--	--	**2.73**	--	--	**63.0**	--	--	**90.9**	--	--
DC-03D	DC-03D-161212	12/12/2016	N	K1615029	0.100	U	--	0.500	U	--	--	--	--	**0.085**	--	--	--	--	--	--	--	--	**2.98**	--	--	**65.0**	--	--	**90.7**	--	--
DC-03D	YVD-030817-14	3/8/2017	N	K1702324	**0.050**	J	--	0.500	U	--	--	--	--	**0.008**	J	--	--	--	--	--	--	--	**2.75**	--	--	**61.3**	--	--	**80.8**	--	--
DC-03D	YVD-030817-16	3/8/2017	FD	K1702324	**0.040**	J	--	0.500	U	--	--	--	--	**0.008**	J	--	--	--	--	--	--	--	**2.69**	--	--	**60.2**	--	--	**79.6**	--	--
DC-03D	YVD-060517-09	6/5/2017	N	K1705702	0.100	U	--	0.500	U	--	--	--	--	**0.006**	J	--	--	--	--	--	--	--	**2.66**	--	--	**59.7**	--	--	**91.6**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-03D	YVD-092617-24	9/26/2017	N	K1710333	0.100	U	--	--	R	MSD	--	--	--	**0.011**	--	--	--	--	--	--	--	--	**3.16**	--	--	**67.1**	--	--	**101**	--	--
DC-03D	YVD-120417-08	12/4/2017	N	K1713026	0.100	U	--	0.500	U	--	--	--	--	0.011	U	MBK	--	--	--	--	--	--	**2.64**	--	--	**60.9**	--	--	**86.7**	--	--
DC-03D	YVD-031818-02	3/18/2018	N	870610	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.02**	--	--	**70.0**	--	--	**86.1**	--	--
DC-03D	YVD-060418-24	6/4/2018	N	874860	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.24**	--	--	**67.0**	--	--	**82.1**	--	--
DC-03D	YVD-090918-15	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.01**	--	--	**68.0**	--	--	**88.6**	--	--
DC-03D	YVD-121018-05	12/10/2018	N	884857	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.18**	--	--	**67.0**	--	--	**83.0**	--	--
DC-03D	YVD-031819-17	3/18/2019	N	988273	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.16**	--	--	**66.5**	--	--	**82.0**	--	--
DC-03D	YVD-060419-30	6/4/2019	N	992242	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.94**	--	--	**65.5**	--	--	**81.8**	--	--
DC-03D	YVD-060419-31	6/4/2019	FD	992242	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.96**	--	--	**66.0**	--	--	**82.6**	--	--
DC-03D	YVD-091019-21	9/10/2019	N	998438	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.99**	--	--	**65.0**	--	--	**81.7**	--	--
DC-03D	YVD-091019-22	9/10/2019	FD	998438	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.98**	--	--	**65.0**	--	--	**81.7**	--	--
DC-03D	YVD-121019-20	12/10/2019	N	902321	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.18**	--	--	**61.5**	--	--	**80.9**	--	--
DC-03D	YVD-033120-20	3/31/2020	N	006260	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.92**	--	--	**64.0**	--	--	**74.5**	--	--
DC-03D	YVD-061020-34	6/10/2020	N	009361	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.85**	--	--	**62.5**	--	--	**75.0**	--	--
DC-03D	YVD-092120-19	9/21/2020	N	013896	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.96**	--	--	**65.0**	--	--	**82.4**	--	--
DC-03D	YVD-120720-09	12/7/2020	N	017035	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.31**	--	--	**63.5**	--	--	**77.0**	--	--
DC-03D	YVD-030221-21	3/2/2021	N	120034	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.96**	--	--	**63.5**	--	--	**80.6**	--	--
DC-03D	YVD-030221-21	3/2/2021	N	120034	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.96**	--	--	**63.5**	--	--	**80.6**	--	--
DC-03D	YVD-060821-29	6/8/2021	N	124212	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.04**	--	--	**63.5**	--	--	**83.7**	--	--
DC-03D	YVD-060821-31	6/8/2021	FD	124212	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.98**	--	--	**62.5**	--	--	**81.0**	--	--
DC-03D	YVD-121421-10	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03D	YVD-031422-08	3/14/2022	N	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03D	YVD-060522-11	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03D	YVD-060522-11	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03D	YVD-091322-10	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03D	YVD-122722-20	12/27/2022	N	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03D	YVD-030623-14	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03D	YVD-062023-17	6/20/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03D	YVD-062023-18	6/20/2023	FD	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-04	DC-04-130103	01/03/2013	N	EPA01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-04	DC-04-130920	09/20/2013	N	SWI0142	--	--	--	**3.03**	--	--	--	--	--	--	--	--	0.100	U	--	--	--	--	**3.45**	--	--	**32.1**	--	--	**93.6**	--	--
DC-04	DC-04-130924	09/24/2013	N	SWI0175	2.00	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-04	DC-04-131212	12/12/2013	N	SWL0073	2.00	U	--	0.200	UJ	MSD	--	--	--	--	--	--	--	--	--	**0.104**	--	--	**3.51**	--	--	**31.7**	--	--	**110**	--	--
DC-04	DC-04-140318	03/18/2014	N	SXC0107	2.00	U	--	**0.707**	J--	MSD	**0.130**	--	--	--	--	--	--	--	--	--	--	--	**3.58**	--	--	**30.4**	--	--	**107**	--	--
DC-04	DC-04-140603	06/03/2014	N	SXF0017	0.800	U	--	**0.645**	--	--	**0.240**	J+	FBK	--	--	--	--	--	--	--	--	--	**3.65**	--	--	**32.3**	--	--	**104**	J--	MSD
DC-04	DC-04-140923	09/23/2014	N	SXI0173	1.00	U	--	**0.524**	J+	MSD	**0.290**	--	--	--	--	--	--	--	--	--	--	--	**4.51**	--	--	**35.5**	--	--	**108**	--	--
DC-04	DC-04-141217	12/17/2014	N	SXL0121	1.00	U	--	0.250	UJ	MSD	**0.170**	--	--	--	--	--	--	--	--	--	--	--	**4.34**	--	--	**34.9**	--	--	**120**	--	--
DC-04	DC-04-150317	03/17/2015	N	5904651	1.00	U	--	**0.330**	J--	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.90**	J--	MSD	**36.0**	--	--	**110**	--	--
DC-04	DC-04-150617	06/17/2015	N	59010961	2.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.10**	J+	MSD	**36.0**	J+	MSD	**110**	--	--
DC-04	DC-04-150924	09/24/2015	N	59020391	1.00	U	--	**0.250**	J--	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.90**	--	--	**33.0**	--	--	**140**	J--	MSD
DC-04	YVD-D3-150924	09/24/2015	FD	59020391	1.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.10**	--	--	**35.0**	--	--	**150**	J--	MSD
DC-04	DC-04-151215	12/15/2015	N	59025431	1.00	U	--	--	R	MSD	0.250	UJ	FDP	--	--	--	--	--	--	--	--	--	**4.20**	--	--	**36.0**	--	--	**130**	--	--
DC-04	DC-04-160309	03/09/2016	N	59029711	1.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.00**	--	--	**36.0**	--	--	**150**	J+	MSD
DC-04	DC-04-160621	6/21/2016	N	59037271	1.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.40**	--	--	**39.0**	--	--	**150**	--	--
DC-04	DC-04-160926	9/26/2016	N	K1611506	0.100	U	--	--	R	MSD	--	--	--	**0.137**	--	--	--	--	--	--	--	--	**4.50**	--	--	**38.2**	--	--	**142**	--	--
DC-04	DC-04-161216	12/12/2016	N	K1615174	0.100	U	--	0.500	U	--	--	--	--	**0.052**	--	--	--	--	--	--	--	--	**4.11**	--	--	**36.9**	--	--	**155**	--	--
DC-04	YVD-031017-31	3/10/2017	N	K1702448	0.100	U	--	0.500	U	--	--	--	--	**0.035**	J	FDP	--	--	--	--	--	--	**3.75**	--	--	**32.4**	--	--	**153**	--	--
DC-04	YVD-031017-33	3/10/2017	FD	K1702448	0.100	U	--	0.500	U	--	--	--	--	**0.053**	J	FDP	--	--	--	--	--	--	**3.74**	--	--	**32.3**	--	--	**152**	--	--
DC-04	YVD-060617-26	6/6/2017	N	K1705833	0.100	U	--	0.500	U	--	--	--	--	**0.085**	--	--	--	--	--	--	--	--	**3.96**	--	--	**34.7**	--	--	**129**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-04	YVD-092517-06	9/25/2017	N	K1710274	0.100	U	--	0.500	U	--	--	--	--	**0.044**	--	--	--	--	--	--	--	--	**4.06**	--	--	**35.9**	--	--	**140**	--	--
DC-04	YVD-120517-24	12/5/2017	N	K1713091	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.037**	--	--	--	--	--	--	--	--	**3.62**	--	--	**32.7**	--	--	**121**	--	--
DC-04	YVD-031818-07	3/18/2018	N	870610	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.02**	--	--	**35.6**	--	--	**115**	--	--
DC-04	YVD-060418-18	6/4/2018	N	874662	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.18**	--	--	**34.4**	--	--	**119**	--	--
DC-04	YVD-090918-18	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.98**	--	--	**32.8**	--	--	**109**	--	--
DC-04	YVD-121118-18	12/11/2018	N	884939	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.08**	--	--	**32.0**	--	--	**102**	--	--
DC-04	YVD-032019-21	3/20/2019	N	988477	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.93**	--	--	**32.2**	--	--	**100**	--	--
DC-04	YVD-060219-14	6/2/2019	N	991939	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.00**	--	--	**32.2**	--	--	**103**	--	--
DC-04	YVD-090919-09	9/9/2019	N	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.98**	--	--	**31.6**	--	--	**102**	--	--
DC-04	YVD-120919-07	12/9/2019	N	902276	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.20**	--	--	**32.2**	J	MSD	**101**	--	--
DC-04	YVD-033120-18	3/31/2020	N	006260	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.04**	--	--	**32.8**	--	--	**101**	--	--
DC-04	YVD-060820-08	6/8/2020	N	009144	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	**0.070**	--	--	**4.14**	--	--	**33.8**	--	--	**102**	--	--
DC-04	YVD-092020-07	9/20/2020	N	013864	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.22**	--	--	**34.6**	--	--	**108**	--	--
DC-04	YVD-120820-23	12/8/2020	N	017137	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.32**	--	--	**35.2**	--	--	**121**	--	--
DC-04	YVD-030221-20	3/2/2021	N	120034	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.40**	--	--	**34.7**	--	--	**112**	--	--
DC-04	YVD-030221-22	3/2/2021	FD	120034	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.22**	--	--	**34.3**	--	--	**111**	--	--
DC-04	YVD-030221-20	3/2/2021	N	120034	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.40**	--	--	**34.7**	--	--	**112**	--	--
DC-04	YVD-030221-22	3/2/2021	FD	120034	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.22**	--	--	**34.3**	--	--	**111**	--	--
DC-04	YVD-060621-06	6/6/2021	N	124053	0.050	U	--	5.00	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.22**	--	--	**33.2**	--	--	**109**	--	--
DC-04	YVD-121521-21	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-04	YVD-031522-15	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-04	YVD-060522-05	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-04	YVD-091322-06	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-04	YVD-120722-09	12/7/2022	N	K2214479	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-04	YVD-120722-10	12/7/2022	FD	K2214479	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-04	YVD-030623-17	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-04	YVD-030623-18	3/6/2023	FD	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-04	YVD-062023-11	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05	DC-05-130104	01/04/2013	N	EPA01	--		--	--		--	--	--	--	--	--	--	--	--	--	--	--	--	--		--	--		--	--		--
DC-05	DC-05-130920	09/20/2013	N	SWI0142	--		--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	**2.88**		--	**64.2**		--	**154**		--
DC-05	DC-05-130924	09/24/2013	N	SWI0175	2.00	U	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--	--		--	--		--	--		--
DC-05	DC-05-131212	12/12/2013	N	SWL0073	2.00	U	--	0.200	UJ	MSD	--	--	--	--	--	--	--	--	--	**0.723**	--	--	**3.92**	--	--	**64.2**	--	--	**178**	--	--
DC-05	DC-05-140318	03/18/2014	N	SXC0107	2.00	U	--	**0.558**	J--	MSD	**0.060**	--	--	--	--	--	--	--	--	--	--	--	**2.90**	--	--	**59.4**	--	--	**150**	--	--
DC-05	DC-05-140603	06/03/2014	N	SXF0017	0.800	U	--	**0.581**	--	--	**0.280**	J+	FBK	--	--	--	--	--	--	--	--	--	**3.25**	--	--	**61.3**	--	--	**128**	J--	MSD
DC-05	DC-05-140923	09/23/2014	N	SXI0173	1.00	U	--	**1.00**	J+	MSD	**0.160**	--	--	--	--	--	--	--	--	--	--	--	**3.86**	--	--	**71.0**	--	--	**122**	--	--
DC-05	DC-05-141217	12/17/2014	N	SXL0121	1.00	U	--	0.250	UJ	MSD	**0.130**	--	--	--	--	--	--	--	--	--	--	--	**3.41**	--	--	**59.0**	--	--	**141**	--	--
DC-05	DC-05-150317	03/17/2015	N	5904541	0.800	U	--	**0.270**	J--	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.00**	--	--	**61.0**	--	--	**140**	J--	MSD
DC-05	DC-05-150616	06/16/2015	N	59010961	0.800	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.00**	J+	MSD	**64.0**	J+	MSD	**120**	--	--
DC-05	YVD-D2-150616	06/16/2015	FD	59010961	2.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.30**	J+	MSD	**64.0**	J+	MSD	**110**	--	--
DC-05	DC-05-150923	09/23/2015	N	59020391	0.800	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.10**	--	--	**56.0**	--	--	**110**	J--	MSD
DC-05	DC-05-151215	12/15/2015	N	59025431	0.800	U	--	--	R	MSD	0.250	UJ	FDP	--	--	--	--	--	--	--	--	--	**2.90**	--	--	**51.0**	--	--	**120**	--	--
DC-05	DC-05-160309	03/09/2016	N	59029711	0.800	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.90**	--	--	**53.0**	--	--	**140**	J+	MSD
DC-05	DC-05-160621	6/21/2016	N	59037151	0.800	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.80**	--	--	**53.0**	--	--	**130**	--	--
DC-05	DC-05-160926	9/26/2016	N	K1611506	0.100	U	--	--	R	MSD	--	--	--	**0.031**	--	--	--	--	--	--	--	--	**2.89**	--	--	**54.9**	--	--	**114**	--	--
DC-05	DC-05-D1-160926	9/26/2016	FD	K1611506	0.100	U	--	--	R	MSD	--	--	--	**0.028**	--	--	--	--	--	--	--	--	**3.06**	--	--	**58.1**	--	--	**114**	--	--
DC-05	DC-05-161216	12/16/2016	N	K1615174	0.100	U	--	0.500	U	--	--	--	--	**0.048**	--	--	--	--	--	--	--	--	**2.60**	--	--	**47.9**	--	--	**108**	--	--
DC-05	YVD-D5-161216	12/16/2016	FD	K1615174	0.100	U	--	0.500	U	--	--	--	--	**0.04**	--	--	--	--	--	--	--	--	**2.65**	--	--	**49.6**	--	--	**107**	--	--
DC-05	YVD-030717-09	3/7/2017	N	K1702324	0.100	U	--	0.500	U	--	--	--	--	**0.026**	--	--	--	--	--	--	--	--	**2.61**	--	--	**58.3**	--	--	**97.6**	--	--
DC-05	YVD-060717-30	6/7/2017	N	K1705833	0.100	U	--	0.500	U	--	--	--	--	**0.059**	J	FDP	--	--	--	--	--	--	**2.82**	--	--	**63.9**	--	--	**102**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-05	YVD-060717-32	6/7/2017	FD	K1705833	0.100	U	--	0.500	U	--	--	--	--	**0.031**	J	FDP	--	--	--	--	--	--	**2.77**	--	--	**62.6**	--	--	**102**	--	--
DC-05	YVD-092517-04	9/25/2017	N	K1710274	0.100	U	--	0.500	U	--	--	--	--	**0.039**	--	--	--	--	--	--	--	--	**2.99**	--	--	**62.0**	--	--	**107**	--	--
DC-05	YVD-120517-16	12/5/2017	N	K1713091	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.014**	--	--	--	--	--	--	--	--	**2.52**	--	--	**59.1**	--	--	**88.8**	--	--
DC-05	YVD-120517-18	12/5/2017	FD	K1713091	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.014**	--	--	--	--	--	--	--	--	**2.53**	--	--	**60.0**	--	--	**89.3**	--	--
DC-05	YVD-031818-03	3/18/2018	N	870610	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.94**	--	--	**75.0**	--	--	**97.4**	--	--
DC-05	YVD-031818-05	3/18/2018	FD	870610	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.94**	--	--	**75.0**	--	--	**96.7**	--	--
DC-05	YVD-060318-02	6/3/2018	FD	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.02**	--	--	**72.0**	--	--	**88.3**	--	--
DC-05	YVD-090918-03	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.91**	--	--	**65.5**	--	--	**95.4**	--	--
DC-05	YVD-121118-16	12/11/2018	N	884939	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.05**	--	--	**68.1**	--	--	**92.2**	--	--
DC-05	YVD-031719-02	3/17/2019	N	988239	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.10**	--	--	**68.5**	--	--	**117**	--	--
DC-05	YVD-060219-08	6/2/2019	N	991939	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.14**	--	--	**71.0**	--	--	**122**	--	--
DC-05	YVD-090919-14	9/9/2019	N	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.02**	--	--	**65.5**	--	--	**129**	--	--
DC-05	YVD-120919-03	12/9/2019	N	902276	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.12**	--	--	**72.5**	J	MSD	**110**	--	--
DC-05	YVD-033020-12	3/30/2020	N	006241	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.20**	--	--	**76.0**	--	--	**142**	--	--
DC-05	YVD-060820-06	6/8/2020	N	009144	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.26**	--	--	**76.0**	--	--	**114**	--	--
DC-05	YVD-092020-03	9/20/2020	N	013864	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.18**	--	--	**72.0**	--	--	**149**	--	--
DC-05	YVD-120720-06	12/7/2020	N	017035	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.42**	--	--	**65.0**	--	--	**166**	--	--
DC-05	YVD-030221-16	3/2/2021	N	120034	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.24**	--	--	**60.0**	--	--	**143**	--	--
DC-05	YVD-060721-14	6/7/2021	N	124105	0.050	U	--	5.00	UJ	MS, RPD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.26**	--	--	**52.0**	--	--	**102**	--	--
DC-05	YVD-121521-15	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05	YVD-031422-04	3/14/2022	N	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05	YVD-060522-02	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05	YVD-060522-03	6/5/2022	FD	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05	YVD-091322-02	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05	YVD-091322-04	9/13/2022	FD	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05	YVD-120622-02	12/6/2022	N	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05	YVD-120622-03	12/6/2022	FD	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05	YVD-030623-20	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05	YVD-062023-08	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05D	DC-05D-130920	09/20/2013	N	SWI0142	--	--	--	**0.361**	--	--	--	--	--	--	--	--	**0.163**	--	--	--	--	--	**3.67**	--	--	**40.5**	--	--	**167**	--	--
DC-05D	DC-05D-130924	09/24/2013	N	SWI0178	0.200	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05D	DC-05D-131211	12/11/2013	N	SWL0073	2.00	U	--	0.200	UJ	MSD	--	--	--	--	--	--	--	--	--	0.060	U	--	**3.52**	--	--	**37.5**	--	--	**145**	--	--
DC-05D	DC-05D-140318	03/18/2014	N	SXC0095	2.00	U	--	0.250	U	--	**0.072**	--	--	--	--	--	--	--	--	--	--	--	**3.73**	--	--	**36.7**	--	--	**137**	J--	MSD
DC-05D	DC-05D-140602	06/02/2014	N	SXF0017	0.800	U	--	**0.591**	--	--	**0.560**	J+	FBK	--	--	--	--	--	--	--	--	--	**4.99**	--	--	**34.3**	--	--	**122**	J--	MSD
DC-05D	DC-05D-140922	09/22/2014	N	SXI0148	0.800	U	--	**0.424**	--	--	**0.057**	--	--	--	--	--	--	--	--	--	--	--	**3.56**	--	--	**37.8**	--	--	**127**	--	--
DC-05D	DC-05D-141216	12/16/2014	N	SXL0121	0.200	U	--	0.250	UJ	MSD	**0.390**	--	--	--	--	--	--	--	--	--	--	--	**5.18**	--	--	**36.8**	--	--	**140**	--	--
DC-05D	DC-05D-150317	03/17/2015	N	5904541	0.800	U	--	0.250	UJ	MSD	**0.300**	--	--	--	--	--	--	--	--	--	--	--	**4.60**	--	--	**39.0**	--	--	**120**	J--	MSD
DC-05D	DC-05D-150616	06/16/2015	N	59010961	0.800	U	--	0.250	UJ	MSD	**0.270**	--	--	--	--	--	--	--	--	--	--	--	**4.70**	J+	MSD	**41.0**	J+	MSD	**120**	--	--
DC-05D	DC-05D-150923	09/23/2015	N	59020391	0.800	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.40**	--	--	**38.0**	--	--	**120**	J--	MSD
DC-05D	YVD-D2-150923	09/23/2015	FD	59020391	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.40**	--	--	**38.0**	--	--	**120**	J--	MSD
DC-05D	DC-05D-151215	12/15/2015	N	59025431	0.800	U	--	--	R	MSD	0.250	UJ	FDP	--	--	--	--	--	--	--	--	--	**4.40**	--	--	**39.0**	--	--	**120**	--	--
DC-05D	DC-05D-160309	03/09/2016	N	59029711	0.800	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.30**	--	--	**41.0**	--	--	**140**	J+	MSD
DC-05D	DC-05D-160621	6/21/2016	N	59037271	0.800	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.10**	--	--	**41.0**	--	--	**130**	--	--
DC-05D	DC-05D-160926	9/26/2016	N	K1611506	0.100	U	--	--	R	MSD	--	--	--	**0.014**	--	--	--	--	--	--	--	--	**3.93**	--	--	**39.4**	J	MSD	**113**	--	--
DC-05D	DC-05D-161214	12/14/2016	N	K1615126	0.100	U	--	0.500	U	--	--	--	--	**0.015**	--	--	--	--	--	--	--	--	**3.90**	--	--	**38.2**	--	--	**114**	--	--
DC-05D	YVD-030717-12	3/7/2017	N	K1702324	0.100	U	--	0.500	U	--	--	--	--	**0.041**	--	--	--	--	--	--	--	--	**3.64**	--	--	**35.6**	--	--	**105**	--	--
DC-05D	YVD-060717-34	6/7/2017	N	K1705833	0.100	U	--	0.500	U	--	--	--	--	**0.012**	--	--	--	--	--	--	--	--	**3.78**	--	--	**37.4**	--	--	**101**	--	--
DC-05D	YVD-092517-02	9/25/2017	N	K1710274	0.100	U	--	0.500	U	--	--	--	--	**0.024**	J	FDP	--	--	--	--	--	--	**3.91**	--	--	**38.7**	--	--	**118**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-05D	YVD-092517-03	9/25/2017	FD	K1710274	0.100	U	--	0.500	U	--	--	--	--	**0.008**	J	FDP	--	--	--	--	--	--	**4.02**	--	--	**38.9**	--	--	**115**	--	--
DC-05D	YVD-120517-20	12/5/2017	N	K1713091	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.013**	--	--	--	--	--	--	--	--	**3.69**	--	--	**37.6**	--	--	**112**	--	--
DC-05D	YVD-031818-08	3/18/2018	N	870610	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.97**	--	--	**41.2**	--	--	**108**	--	--
DC-05D	YVD-060318-03	6/3/2018	N	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.12**	--	--	**39.6**	--	--	**105**	--	--
DC-05D	YVD-060318-05	6/3/2018	FD	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.14**	--	--	**39.6**	--	--	**105**	--	--
DC-05D	YVD-090918-02	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.00**	--	--	**38.0**	--	--	**107**	--	--
DC-05D	YVD-121118-14	12/11/2018	N	884939	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.15**	--	--	**38.0**	--	--	**102**	--	--
DC-05D	YVD-031719-04	3/17/2019	N	988239	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.06**	--	--	**38.2**	--	--	**110**	--	--
DC-05D	YVD-031719-06	3/17/2019	FD	988239	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.11**	--	--	**38.6**	--	--	**109**	--	--
DC-05D	YVD-060219-10	6/2/2019	N	991939	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.00**	--	--	**37.8**	--	--	**109**	--	--
DC-05D	YVD-090919-12	9/9/2019	N	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.96**	--	--	**35.4**	--	--	**105**	--	--
DC-05D	YVD-120919-05	12/9/2019	N	902276	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.97**	--	--	**36.6**	J	MSD	**105**	--	--
DC-05D	YVD-033020-14	3/30/2020	N	006241	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.01**	--	--	**37.6**	--	--	**107**	--	--
DC-05D	YVD-060820-02	6/8/2020	N	009144	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.03**	--	--	**38.6**	--	--	**118**	--	--
DC-05D	YVD-060820-04	6/8/2020	FD	009144	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.06**	--	--	**38.7**	--	--	**102**	--	--
DC-05D	YVD-092020-04	9/20/2020	N	013864/20I0421	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.02**	--	--	**38.0**	--	--	**107**	--	--
DC-05D	YVD-092020-05	9/20/2020	FD	013864/20I0421	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.03**	--	--	**37.8**	--	--	**106**	--	--
DC-05D	YVD-120720-02	12/7/2020	N	017035	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.30**	--	--	**38.4**	--	--	**108**	--	--
DC-05D	YVD-120720-04	12/7/2020	FD	017035	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.26**	--	--	**38.2**	--	--	**108**	--	--
DC-05D	YVD-030221-18	3/2/2021	N	120034	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.07**	--	--	**37.8**	--	--	**107**	--	--
DC-05D	YVD-060721-13	6/7/2021	N	124105	0.050	U	--	5.00	UJ	MS, RPD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.11**	--	--	**36.9**	--	--	**106**	--	--
DC-05D	YVD-121421-04	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05D	YVD-031422-02	3/14/2022	N	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05D	YVD-031422-03	3/14/2022	FD	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05D	YVD-060522-04	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05D	YVD-091322-03	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05D	YVD-120622-04	12/6/2022	N	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05D	YVD-030623-22	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05D	YVD-062023-10	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-07	DC-07-130103	01/03/2013	N	EPA01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-07	DC-07-130918	09/18/2013	N	SWI0123	2.00	U	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	1.00	U	--	**45.7**	--	--	**168**	--	--
DC-07	YVD-D1-130918	09/18/2013	FD	SWI0123	2.00	U	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	1.00	U	--	**46.1**	--	--	**179**	--	--
DC-07	DC-07-131210	12/10/2013	N	SWL0055	2.00	U	--	0.437	UJ	ERL, MSD	--	--	--	--	--	--	--	--	--	**0.065**	--	--	**3.82**	--	--	**38.4**	--	--	**117**	--	--
DC-07	DC-07-140316	03/16/2014	N	SXC0081	0.800	U	--	0.250	U	--	**0.110**	--	--	--	--	--	--	--	--	--	--	--	**1.04**	--	--	**33.5**	--	--	**78.9**	--	--
DC-07	DC-07-140602	06/02/2014	N	SXF0008	0.800	U	--	**0.340**	--	--	**0.120**	--	--	--	--	--	--	--	--	--	--	--	1.00	U	--	**36.3**	--	--	**105**	--	--
DC-07	DC-07-140922	09/22/2014	N	SXI0148	0.800	U	--	**0.487**	--	--	**0.190**	--	--	--	--	--	--	--	--	--	--	--	1.00	U	--	**33.7**	--	--	**98.2**	--	--
DC-07	DC-07-141216	12/16/2014	N	SXL0108	0.800	U	--	**0.261**	--	--	0.100	U	--	--	--	--	--	--	--	--	--	--	1.00	U	--	**30.6**	--	--	**80.4**	--	--
DC-07	YVD-D2-141216	12/16/2014	FD	SXL0108	0.200	U	--	**0.305**	--	--	0.100	U	--	--	--	--	--	--	--	--	--	--	1.00	U	--	**30.8**	--	--	**82.1**	--	--
DC-07	DC-07-150317	03/17/2015	N	5904541	0.800	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**1.00**	--	--	**35.0**	--	--	**83.0**	J--	MSD
DC-07	DC-07-150617	06/17/2015	N	59011021	0.800	U	--	**0.280**	J--	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	1.00	U	--	**37.0**	J	RPD	**93.0**	--	--
DC-07	DC-07-150924	09/24/2015	N	59020391	0.800	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	1.00	U	--	**33.0**	--	--	**95.0**	J--	MSD
DC-07	DC-07-151215	12/15/2015	N	59025501	0.800	U	--	--	R	MSD	**0.410**	J--	MSD	--	--	--	--	--	--	--	--	--	1.00	U	--	**34.0**	--	--	**70.0**	--	--
DC-07	DC-07-160309	03/09/2016	N	59029941	0.800	U	--	--	R	FBK, FDP, MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**1.10**	--	--	**36.0**	--	--	**78.0**	J	DUP
DC-07	DC-07-160621	6/21/2016	N	59037271	0.800	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**1.20**	--	--	**38.0**	--	--	**96.0**	--	--
DC-07	DC-07-160926	9/26/2016	N	K1611565	0.100	U	--	--	R	MSD	--	--	--	**0.057**	--	--	--	--	--	--	--	--	**1.06**	--	--	**36.6**	--	--	**92.3**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-07	DC-07-161214	12/14/2016	N	K1615083	0.100	U	--	0.500	U	--	--	--	--	**0.078**	--	--	--	--	--	--	--	--	**1.05**	--	--	**32.0**	--	--	**72.4**	--	--
DC-07	YVD-030917-25	3/9/2017	N	K1702448	0.100	U	--	0.500	U	--	--	--	--	**0.093**	--	--	--	--	--	--	--	--	**1.03**	--	--	**32.1**	--	--	**59.8**	--	--
DC-07	YVD-060617-18	6/6/2017	N	K1705754	0.100	U	--	0.500	U	--	--	--	--	**0.061**	--	--	--	--	--	--	--	--	**1.10**	--	--	**34.6**	--	--	**70.4**	--	--
DC-07	YVD-092517-12	9/25/2017	N	K1710333	0.100	U	--	0.500	U	--	--	--	--	**0.058**	--	--	--	--	--	--	--	--	**1.14**	--	--	**34.5**	--	--	**94.2**	--	--
DC-07	YVD-120417-14	12/4/2017	N	K1713026	0.100	U	--	0.500	U	--	--	--	--	**0.064**	--	--	--	--	--	--	--	--	**1.17**	--	--	**33.0**	--	--	**81.9**	--	--
DC-07	YVD-060318-17	6/3/2018	N	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**1.52**	--	--	**37.8**	--	--	**93.4**	--	--
DC-07	YVD-060319-20	6/3/2019	N	992053	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**0.820**	--	--	**44.0**	--	--	**49.5**	--	--
DC-07	YVD-060920-18	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**0.980**	--	--	**59.5**	--	--	**110**	--	--
DC-07	YVD-092120-22	9/21/2020	N	013896	0.050	U	--	2.50	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**1.02**	--	--	**62.0**	--	--	**77.1**	--	--
DC-07	YVD-120820-22	12/8/2020	N	017137	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**1.06**	--	--	**54.5**	--	--	**59.8**	--	--
DC-07	YVD-030121-10	3/1/2021	N	119931	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**1.02**	--	--	**50.5**	--	--	**73.2**	--	--
DC-07	YVD-060721-16	6/7/2021	N	124105	0.050	U	--	5.00	UJ	MS, RPD	--	--	--	--	--	--	--	--	--	0.070	U	--	**0.960**	--	--	**48.4**	--	--	**23.1**	J	FDP
DC-07	YVD-060721-17	6/7/2021	FD	124105	0.050	U	--	5.00	UJ	MS, RPD	--	--	--	--	--	--	--	--	--	0.070	U	--	**0.970**	--	--	**48.1**	--	--	**37.8**	J	FDP
DC-07	YVD-121521-17	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-07	YVD-031522-13	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-07	YVD-060522-08	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-07	YVD-091422-16	9/14/2022	N	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-07	YVD-091422-17	9/14/2022	FD	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-07	YVD-122722-23	12/27/2022	N	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-07	YVD-030623-12	3/6/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-07	YVD-062123-27	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-09	DC-09-130103	01/03/2013	N	EPA01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-09	DC-09-130923	09/23/2013	N	SWI0178	--	--	--	**0.447**	--	--	--	--	--	--	--	--	0.100	U	--	--	--	--	**2.75**	--	--	**39.7**	--	--	--	--	--
DC-09	DC-09-130926	09/26/2013	N	SWI0190	0.200	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**30.7**	--	--
DC-09	DC-09-131211	12/11/2013	N	SWL0063	0.200	U	--	0.200	U	--	--	--	--	--	--	--	--	--	--	**0.125**	--	--	**2.48**	--	--	**39.1**	--	--	**34.4**	J--	MSD
DC-09	DC-09-140317	03/17/2014	N	SXC0095	0.200	U	--	**0.251**	--	--	**0.180**	--	--	--	--	--	--	--	--	--	--	--	**2.88**	--	--	**36.5**	--	--	**28.8**	J--	MSD
DC-09	DC-09-140602	06/02/2014	N	SXF0008	0.200	U	--	**0.279**	--	--	**0.220**	J	FDP	--	--	--	--	--	--	--	--	--	**2.92**	--	--	**38.1**	--	--	**29.4**	--	--
DC-09	YVD-D3-140602	06/02/2014	FD	SXF0008	0.200	U	--	**0.359**	--	--	**0.160**	J	FDP	--	--	--	--	--	--	--	--	--	**3.08**	--	--	**37.9**	--	--	**29.1**	--	--
DC-09	DC-09-140923	09/23/2014	N	SXI0158	0.200	U	--	0.250	U	--	0.050	U	--	--	--	--	--	--	--	--	--	--	**1.94**	--	--	**38.9**	J+	MSD	**29.6**	--	--
DC-09	DC-09-141216	12/16/2014	N	SXL0108	0.200	U	--	0.250	U	--	**0.130**	--	--	--	--	--	--	--	--	--	--	--	**2.48**	--	--	**39.1**	--	--	**30.2**	--	--
DC-09	DC-09-150316	03/16/2015	N	5904541	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.60**	--	--	**43.0**	--	--	**29.0**	J--	MSD
DC-09	DC-09-150616	06/16/2015	N	59010751	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.30**	J+	MSD	**38.0**	J+	MSD	**28.0**	J--	MSD
DC-09	DC-09-150923	09/23/2015	N	59020281	0.200	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.50**	--	--	**40.0**	--	--	**30.0**	--	--
DC-09	DC-09-151214	12/14/2015	N	59025431	0.200	U	--	--	R	MSD	**0.300**	J	FDP	--	--	--	--	--	--	--	--	--	**2.70**	--	--	**40.0**	--	--	**31.0**	--	--
DC-09	DC-09-160308	03/08/2016	N	59029711	0.200	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.30**	--	--	**39.0**	--	--	**31.0**	J+	MSD
DC-09	YVD-D2-160308	03/08/2016	FD	59029711	0.200	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.10**	--	--	**39.0**	--	--	**31.0**	J+	MSD
DC-09	DC-09-160621	6/21/2016	N	59037151	0.200	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.20**	--	--	**41.0**	--	--	**32.0**	--	--
DC-09	DC-09-160929	9/29/2016	N	K1611704	0.100	U	--	0.500	U	--	--	--	--	**0.016**	--	--	--	--	--	--	--	--	**2.00**	--	--	**39.3**	--	--	**29.8**	--	--
DC-09	DC-09-D4-160929	9/29/2016	FD	K1611704	0.100	U	--	0.500	U	--	--	--	--	**0.013**	--	--	--	--	--	--	--	--	**1.98**	--	--	**38.8**	--	--	**29.6**	--	--
DC-09	DC-09-161215	12/15/2016	N	K1615126	0.100	U	--	0.500	U	--	--	--	--	**0.009**	J	--	--	--	--	--	--	--	**1.99**	--	--	**38.9**	--	--	**30.6**	--	--
DC-09	YVD-D4-161215	12/15/2016	FD	K1615126	0.100	U	--	0.500	U	--	--	--	--	**0.007**	J	--	--	--	--	--	--	--	**1.98**	--	--	**37.8**	--	--	**30.6**	--	--
DC-09	YVD-031317-36	3/13/2017	N	K1702489	0.100	U	--	0.500	U	--	--	--	--	**0.024**	--	--	--	--	--	--	--	--	**2.00**	--	--	**38.8**	--	--	**28.2**	--	--
DC-09	YVD-060717-27	6/7/2017	N	K1705833	0.100	U	--	0.500	U	--	--	--	--	**0.029**	--	--	--	--	--	--	--	--	**1.97**	--	--	**39.3**	--	--	**30.3**	--	--
DC-09	YVD-092617-23	9/26/2017	N	K1710333	0.100	U	--	0.500	U	--	--	--	--	0.010	U	--	--	--	--	--	--	--	**1.98**	--	--	**38.5**	--	--	**32.5**	--	--
DC-09	YVD-120417-09	12/4/2017	N	K1713026	0.100	U	--	0.500	U	--	--	--	--	0.014	U	MBK	--	--	--	--	--	--	**1.86**	--	--	**37.3**	--	--	**30.6**	--	--
DC-09	YVD-060418-25	6/4/2018	N	874860	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.08**	--	--	**40.2**	--	--	**29.2**	--	--
DC-09	YVD-060319-19	6/3/2019	N	992053	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.06**	--	--	**39.2**	--	--	**27.6**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-09	YVD-060920-25	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.04**	--	--	**40.8**	--	--	**30.8**	--	--
DC-09	YVD-060721-15	6/7/2021	N	124105	0.050	U	--	5.00	UJ	MS, RPD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.13**	--	--	**37.4**	--	--	**14.8**	--	--
DC-09	YVD-060722-29	6/7/2022	N	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-09	YVD-062123-22	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-09	YVD-062123-23	6/21/2023	FD	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-14	DC-14-130103	01/03/2013	N	EPA01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-14	DC-14-130917	09/17/2013	N	SWI0113	0.200	U	--	**0.310**	--	--	--	--	--	--	--	--	**0.199**	--	--	--	--	--	**5.85**	--	--	**94.9**	--	--	**34.2**	--	--
DC-14	DC-14-131211	12/11/2013	N	SWL0063	2.00	U	--	0.200	U	--	--	--	--	--	--	--	--	--	--	**0.167**	--	--	**4.71**	--	--	**94.0**	--	--	**33.9**	J--	MSD
DC-14	DC-14-140318	03/18/2014	N	SXC0095	2.00	U	--	0.250	U	--	**0.260**	--	--	--	--	--	--	--	--	--	--	--	**5.25**	--	--	**87.0**	--	--	**35.7**	J--	MSD
DC-14	DC-14-140602	06/02/2014	N	SXF0017	0.400	U	--	**0.367**	--	--	**0.420**	J+	FBK	--	--	--	--	--	--	--	--	--	**5.37**	--	--	**83.2**	--	--	**24.2**	J--	MSD
DC-14	DC-14-140923	09/23/2014	N	SXI0158	0.400	U	--	**0.315**	--	--	**0.300**	--	--	--	--	--	--	--	--	--	--	--	**4.95**	--	--	**88.6**	J+	MSD	**25.9**	--	--
DC-14	DC-14-141216	12/16/2014	N	SXL0108	0.400	U	--	0.250	U	--	**0.140**	--	--	--	--	--	--	--	--	--	--	--	**5.57**	--	--	**84.5**	--	--	**29.8**	--	--
DC-14	DC-14-150316	03/16/2015	N	5904541	0.400	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**6.10**	--	--	**100**	--	--	**38.0**	J--	MSD
DC-14	DC-14-150616	06/16/2015	N	59010961	0.400	U	--	0.250	UJ	MSD	**0.300**	--	--	--	--	--	--	--	--	--	--	--	**6.50**	J+	MSD	**85.0**	J+	MSD	**29.0**	--	--
DC-14	DC-14-150924	09/24/2015	N	59020391	0.400	U	--	0.250	UJ	MSD	**0.310**	--	--	--	--	--	--	--	--	--	--	--	**6.30**	--	--	**92.0**	--	--	**42.0**	J--	MSD
DC-14	DC-14-151214	12/14/2015	N	59025351	0.400	U	--	0.250	UJ	MSD	**0.350**	--	--	--	--	--	--	--	--	--	--	--	**6.60**	--	--	**100**	--	--	**39.0**	--	--
DC-14	YVD-D1-151214	12/14/2015	FD	59025351	0.200	U	--	0.250	UJ	MSD	**0.380**	--	--	--	--	--	--	--	--	--	--	--	**6.60**	--	--	**100**	--	--	**41.0**	--	--
DC-14	DC-14-160309	03/09/2016	N	59029711	0.400	U	--	--	R	MSD	**0.330**	--	--	--	--	--	--	--	--	--	--	--	**6.60**	--	--	**95.0**	--	--	**39.0**	J+	MSD
DC-14	DC-14-160620	6/20/2016	N	59037151	0.400	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**6.00**	--	--	**92.0**	--	--	**38.0**	--	--
DC-14	DC-14-160929	9/29/2016	N	K1611704	0.100	U	--	0.500	U	--	--	--	--	**0.009**	J	--	--	--	--	--	--	--	**4.75**	--	--	**74.9**	--	--	**23.1**	--	--
DC-14	DC-14-161216	12/16/2016	N	K1615174	0.100	U	--	0.500	U	--	--	--	--	**0.014**	--	--	--	--	--	--	--	--	**4.37**	--	--	**68.8**	--	--	**21.9**	--	--
DC-14	YVD-031317-38	3/14/2017	N	K1702542	0.100	U	--	0.500	U	--	--	--	--	**0.074**	--	--	--	--	--	--	--	--	**4.57**	--	--	**68.4**	--	--	**20.8**	--	--
DC-14	YVD-060617-19	6/6/2017	N	K1705754	0.100	U	--	0.500	U	--	--	--	--	**0.010**	J	--	--	--	--	--	--	--	**4.40**	--	--	**65.2**	--	--	**26.9**	--	--
DC-14	YVD-092517-11	9/25/2017	N	K1710274	0.100	U	--	0.500	U	--	--	--	--	**0.005**	J	--	--	--	--	--	--	--	**4.63**	--	--	**64.3**	--	--	**23.9**	--	--
DC-14	YVD-120617-27	12/6/2017	N	K1713157	0.100	U	--	0.500	U	--	--	--	--	**0.020**	--	--	--	--	--	--	--	--	**4.49**	--	--	**60.5**	--	--	**20.3**	--	--
DC-14	YVD-120617-29	12/6/2017	FD	K1713157	0.100	U	--	0.500	U	--	--	--	--	**0.021**	--	--	--	--	--	--	--	--	**4.44**	--	--	**60.6**	--	--	**20.0**	--	--
DC-14	YVD-031918-20	3/19/2018	N	870634	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.56**	--	--	**58.0**	--	--	**17.8**	--	--
DC-14	YVD-060518-28	6/5/2018	N	874860	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.62**	--	--	**56.0**	--	--	**16.1**	--	--
DC-14	YVD-060518-30	6/5/2018	FD	874860	--	R	PRS	0.500	UJ	MBK	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.78**	--	--	**57.5**	--	--	--	R	PRS
DC-14	YVD-090918-08	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.80**	--	--	**54.0**	--	--	**16.0**	--	--
DC-14	YVD-090918-10	9/9/2018	FD	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.78**	--	--	**53.5**	--	--	**15.3**	--	--
DC-14	YVD-121018-07	12/10/2018	N	884857	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.92**	--	--	**55.5**	--	--	**14.9**	--	--
DC-14	YVD-031719-09	3/17/2019	N	988239	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.05**	--	--	**53.5**	--	--	**15.1**	--	--
DC-14	YVD-060319-17	6/3/2019	N	992053	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.15**	--	--	**53.5**	--	--	**13.6**	--	--
DC-14	YVD-091019-18	9/10/2019	N	998438	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.20**	--	--	**53.5**	--	--	**17.1**	--	--
DC-14	YVD-120919-14	12/9/2019	N	902276	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.40**			**54.5**	J	MSD	**20.3**	--	--
DC-14	YVD-033120-19	3/31/2020	N	006260	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.25**	--	--	**53.5**	--	--	**21.1**	--	--
DC-14	YVD-033120-21	3/31/2020	FD	006260	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.35**	--	--	**54.5**	--	--	**21.3**	--	--
DC-14	YVD-061020-32	6/10/2020	N	009361	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.45**	--	--	**53.0**	--	--	**22.5**	--	--
DC-14	YVD-061020-33	6/10/2020	FD	009361	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.35**	--	--	**52.0**	--	--	**22.4**	--	--
DC-14	YVD-092120-23	9/21/2020	N	013896	0.050	U	--	1.00	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.60**	--	--	**56.5**	--	--	**24.4**	--	--
DC-14	YVD-120820-21	12/8/2020	N	017137	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**6.10**	--	--	**57.5**	--	--	**26.6**	--	--
DC-14	YVD-030121-09	3/1/2021	N	119931	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**6.15**	--	--	**58.0**	--	--	**32.1**	--	--
DC-14	YVD-060821-33	6/8/2021	N	124212	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**6.35**	--	--	**57.0**	--	--	**27.9**	--	--
DC-14	YVD-121521-19	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-14	YVD-031522-16	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-14	YVD-060722-28	6/7/2022	N	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-14	YVD-091422-18	9/14/2022	N	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-14	YVD-122822-24	12/28/2022	N	K2215296	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 8
Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-14	YVD-030623-16	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-14	YVD-062023-12	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	YVD-02-130924	09/24/2013	N	SWI0178	0.200	U	--	0.250	U	--	--	--	--	--	--	--	**0.124**	--	--	--	--	--	**3.50**	--	--	**8.56**	--	--	**5.77**	--	--
YVD-02	YVD-02-140316	03/16/2014	N	SXC0081	0.200	U	--	0.250	U	--	**0.540**	--	--	--	--	--	--	--	--	--	--	--	**12.6**	--	--	**88.6**	--	--	**66.9**	--	--
YVD-02	YVD-02-140602	06/02/2014	N	SXF0008	0.200	U	--	**0.490**	--	--	**3.80**	--	--	--	--	--	--	--	--	--	--	--	**8.53**	--	--	**23.0**	--	--	**3.12**	--	--
YVD-02	YVD-02-140921	09/21/2014	N	SXI0148	0.200	U	--	**0.274**	--	--	**1.20**	J	FDP	--	--	--	--	--	--	--	--	--	**4.53**	--	--	**11.6**	J	FDP	**13.8**	--	--
YVD-02	YVD-D1-140921	09/21/2014	FD	SXI0148	0.200	U	--	0.250	U	--	**0.860**	J	FDP	--	--	--	--	--	--	--	--	--	**5.05**	--	--	**15.7**	J	FDP	**15.6**	--	--
YVD-02	YVD-02-141215	12/15/2014	N	SXL0103	0.200	U	--	**0.358**	--	--	**0.610**	--	--	--	--	--	--	--	--	--	--	--	**5.35**	--	--	**16.1**	--	--	**33.6**	J+	MSD, DUP
YVD-02	YVD-02-150615	06/15/2015	N	59010751	0.200	U	--	0.250	UJ	MSD	**1.10**	--	--	--	--	--	--	--	--	--	--	--	**4.10**	J+	MSD	**12.0**	J+	MSD	**3.20**	J--	MSD
YVD-02	YVD-02-150923	09/23/2015	N	59020281	0.200	U	--	**0.250**	J--	MSD	**1.00**	J+	FBK		--	--	--	--	--	--	--	--	**4.80**	--	--	**14.0**	--	--	**9.50**	--	--
YVD-02	YVD-02-151214	12/14/2015	N	59025351	0.200	U	--	**0.760**	J--	MSD	**0.680**	--	--	--	--	--	--	--	--	--	--	--	**6.30**	--	--	**25.0**	--	--	**24.0**	--	--
YVD-02	YVD-02-160308	03/08/2016	N	59029521	0.200	U	--	**0.250**	J--	MSD	**0.590**	--	--	--	--	--	--	--	--	--	--	--	**5.80**	--	--	**22.0**	--	--	**54.0**	--	--
YVD-02	YVD-02-160620	6/20/2016	N	59037101	0.200	U	--	**0.350**	J--	MSD	**0.520**	--	--	--	--	--	--	--	--	--	--	--	**4.20**	--	--	**9.70**	--	--	**8.00**	J--	MSD
YVD-02	YVD-02-160928	9/28/2016	N	K1611629	0.100	U	--	0.500	U	--	--	--	--	**0.092**	--	--	--	--	--	--	--	--	**3.41**	--	--	**5.07**	--	--	**3.13**	--	--
YVD-02	YVD-030817-15	3/8/2017	N	K1702324	0.100	U	--	0.500	U	--	--	--	--	**0.099**	--	--	--	--	--	--	--	--	**3.51**	--	--	**7.06**	--	--	**11.7**	--	--
YVD-02	YVD-060617-14	6/6/2017	N	K1705754	0.100	U	--	0.500	U	--	--	--	--	**0.093**	--	--	--	--	--	--	--	--	**3.00**	--	--	**5.95**	--	--	**3.43**	J	FDP
YVD-02	YVD-060617-16	6/6/2017	FD	K1705754	0.100	U	--	0.500	U	--	--	--	--	**0.081**	--	--	--	--	--	--	--	--	**3.00**	--	--	**5.91**	--	--	**12.2**	J	FDP
YVD-02	YVD-092617-20	9/26/2017	N	K1710333	0.100	U	--	0.500	U	--	--	--	--	**0.09**	--	--	--	--	--	--	--	--	**3.06**	--	--	**5.20**	--	--	**4.79**	--	--
YVD-02	YVD-120417-02	12/4/2017	N	K1713026	0.100	U	--	0.500	U	--	--	--	--	**0.080**	--	--	--	--	--	--	--	--	**3.18**	--	--	**9.59**	--	--	**16.1**	--	--
YVD-02	YVD-120417-04	12/4/2017	FD	K1713026	0.100	U	--	0.500	U	--	--	--	--	**0.074**	--	--	--	--	--	--	--	--	**3.08**	--	--	**9.58**	--	--	**15.8**	--	--
YVD-02	YVD-061218-32	6/12/2018	N	875438	--	R	NR	--	R	NR	--	--	--	--	--	--	--	--	--	--	R	NR	--	R	NR	--	R	NR	--	R	NR
YVD-02	YVD-060419-28	6/4/2019	N	992242	**0.240**	--	--	0.500	U	--	--	--	--	--	--	--	--	--	--	**0.100**	--	--	**5.15**	--	--	**14.8**	--	--	**39.9**	--	--
YVD-02	YVD-070219-33	7/2/2019	N	994356	**0.900**	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**6.50**	--	--	**26.8**	--	--	**47.5**	--	--
YVD-02	YVD-091019-19	9/10/2019	N	998438	0.050	U	--	UJ	MSD	--	--	--	--	--	--	--	--	--	--	**0.070**	--	--	**6.60**	--	--	**21.6**	--	--	**40.4**	--	--
YVD-02	YVD-121019-23	12/10/2019	N	902321	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**7.10**	--	--	**38.3**	--	--	**62.2**	--	--
YVD-02	YVD-040120-23	4/1/2020	N	006311	**4.38**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**6.25**	--	--	**75.0**	--	--	**96.6**	--	--
YVD-02	YVD-061120-35	6/11/2020	N	009430	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	9/21/2020	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	12/8/2020	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	3/1/2021	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	6/8/2021	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	12/15/2021	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	3/15/2022	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	6/7/2022	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	9/12/2022	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	12/5/2022	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	3/6/2023	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	6/20/2023	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-03	YVD-03-130916	09/16/2013	N	SWI0113	**0.490**	--	--	**0.488**	--	--	--	--	--	--	--	--	**0.890**	--	--	--	--	--	**9.00**	--	--	**43.0**	--	--	**70.7**	--	--
YVD-03	YVD-03-131210	12/10/2013	N	SWL0063	0.400	U	--	0.200	U	--	--	--	--	--	--	--	--	--	--	**1.02**	--	--	**6.67**	--	--	**40.2**	--	--	**54.8**	J--	MSD
YVD-03	YVD-03-140317	03/17/2014	N	SXC0081	0.200	U	--	0.250	U	--	**0.230**	--	--	--	--	--	--	--	--	--	--	--	**4.10**	--	--	**37.6**	--	--	**38.0**	--	--
YVD-03	YVD-03-140602	06/02/2014	N	SXF0008	0.200	U	--	**0.261**	--	--	**0.300**	--	--	--	--	--	--	--	--	--	--	--	**3.93**	--	--	**36.8**	--	--	**36.0**	--	--
YVD-03	YVD-03-140923	09/23/2014	N	SXI0158	0.200	U	--	0.250	U	--	**0.330**	J	FDP	--	--	--	--	--	--	--	--	--	**4.66**	J	FDP	**40.7**	J+	MSD	**34.7**	--	--
YVD-03	YVD-D3-140923	09/23/2014	FD	SXI0158	0.200	U	--	0.250	U	--	**0.240**	J	FDP	--	--	--	--	--	--	--	--	--	**3.62**	J	FDP	**38.0**	J+	MSD	**34.4**	--	--
YVD-03	YVD-03-141215	12/15/2014	N	SXL0108	0.200	U	--	**0.400**	--	--	**0.760**	--	--	--	--	--	--	--	--	--	--	--	**4.47**	--	--	**39.1**	--	--	**37.0**	--	--
YVD-03	YVD-03-150316	03/16/2015	N	5904541	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.90**	--	--	**39.0**	--	--	**33.0**	J--	MSD
YVD-03	YVD-03-150616	06/16/2015	N	59010751	0.200	U	--	0.250	UJ	MSD	**0.590**	--	--	--	--	--	--	--	--	--	--	--	**6.10**	J+	MSD	**37.0**	J+	MSD	**41.0**	J--	MSD

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-03	YVD-03-150922	09/22/2015	N	59020141	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**6.50**	--	--	**40.0**	--	--	**51.0**	--	--
YVD-03	YVD-03-151214	12/14/2015	N	59025351	0.200	U	--	0.250	UJ	MSD	**0.780**	--	--	--	--	--	--	--	--	--	--	--	**7.80**	--	--	**43.0**	--	--	**51.0**	--	--
YVD-03	YVD-03-160307	03/07/2016	N	59029521	0.200	U	--	0.250	UJ	MSD	**0.340**	--	--	--	--	--	--	--	--	--	--	--	**7.10**	--	--	**40.0**	--	--	**47.0**	--	--
YVD-03	YVD-03-160620	6/20/2016	N	59037151	0.200	U	--	0.250	U	--	**0.470**	--	--	--	--	--	--	--	--	--	--	--	**7.70**	--	--	**40.0**	--	--	**61.0**	--	--
YVD-03	YVD-03-160929	9/29/2016	N	K1611758	0.100	U	--	0.500	U	--	--	--	--	**0.047**	--	--	--	--	--	--	--	--	**6.89**	--	--	**41.4**	--	--	**44.4**	--	--
YVD-03	YVD-03-161213	12/13/2016	N	K1615045	0.100	U	--	0.500	U	--	--	--	--	**0.11**	--	--	--	--	--	--	--	--	**6.57**	--	--	**38.9**	--	--	**43.3**	--	--
YVD-03	YVD-030617-02	3/6/2017	N	K1702228	0.100	U	--	0.500	U	--	--	--	--	**0.083**	J	FDP	--	--	--	--	--	--	**6.53**	--	--	**38.5**	--	--	**40.7**	--	--
YVD-03	YVD-030617-03	3/6/2017	FD	K1702228	0.100	U	--	0.500	U	--	--	--	--	**0.061**	J	FDP	--	--	--	--	--	--	**6.48**	--	--	**38.4**	--	--	**40.7**	--	--
YVD-03	YVD-060517-13	6/5/2017	N	K1705702	0.100	U	--	0.500	U	--	--	--	--	**0.045**	--	--	--	--	--	--	--	--	**6.27**	--	--	**36.4**	--	--	**46.4**	--	--
YVD-03	YVD-092517-05	9/25/2017	N	K1710274	0.100	U	--	0.500	U	--	--	--	--	**0.038**	--	--	--	--	--	--	--	--	**6.85**	--	--	**40.9**	--	--	**46.3**	--	--
YVD-03	YVD-120517-19	12/5/2017	N	K1713091	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.047**	--	--	--	--	--	--	--	--	**6.39**	--	--	**38.0**	--	--	**50.8**	--	--
YVD-03	YVD-060518-27	6/5/2018	N	874860	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**6.70**	--	--	**39.3**	--	--	**41.7**	--	--
YVD-03	YVD-060219-07	6/2/2019	N	991939	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**6.65**	--	--	**38.5**	--	--	**26.1**	--	--
YVD-03	YVD-060820-09	6/8/2020	N	009144	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**6.65**	--	--	**39.6**	--	--	**48.6**	--	--
YVD-03	YVD-060821-24	6/8/2021	N	124212	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**6.85**	--	--	**37.6**	--	--	**33.0**	--	--
YVD-03	YVD-060822-31	6/8/2022	N	K2206299	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-03	YVD-060822-32	6/8/2022	FD	K2206299	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-03	YVD-061923-04	6/19/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-04	YVD-04-130916	09/16/2013	N	SWI0113	0.200	U	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	**4.23**	--	--	**49.2**	--	--	**39.1**	--	--
YVD-04	YVD-04-131210	12/10/2013	N	SWL0063	0.400	U	--	0.200	U	--	--	--	--	--	--	--	--	--	--	**0.112**	--	--	**4.44**	--	--	**49.9**	--	--	**42.2**	J--	MSD
YVD-04	YVD-04-140317	03/17/2014	N	SXC0081	0.200	U	--	0.250	U	--	**0.078**	--	--	--	--	--	--	--	--	--	--	--	**4.46**	--	--	**47.8**	--	--	**35.2**	--	--
YVD-04	YVD-04-140602	06/02/2014	N	SXF0008	0.400	U	--	0.250	U	--	**0.053**	--	--	--	--	--	--	--	--	--	--	--	**4.41**	--	--	**50.5**	--	--	**36.2**	--	--
YVD-04	YVD-04-140923	09/23/2014	N	SXI0158	0.200	U	--	0.250	U	--	**0.061**	--	--	--	--	--	--	--	--	--	--	--	**4.49**	--	--	**52.2**	J+	MSD	**35.8**	--	--
YVD-04	YVD-04-141215	12/15/2014	N	SXL0108	0.200	U	--	0.250	U	--	0.100	U	--	--	--	--	--	--	--	--	--	--	**4.62**	--	--	**50.0**	--	--	**35.8**	--	--
YVD-04	YVD-04-150315	03/15/2015	N	5904471	0.200	U	--	0.250	UJ	MSD	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**4.70**	--	--	**52.0**	--	--	**34.0**	--	--
YVD-04	YVD-04-150615	06/15/2015	N	59010751	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.70**	J+	MSD	**49.0**	J+	MSD	**34.0**	J--	MSD
YVD-04	YVD-04-150922	09/22/2015	N	59020141	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.60**	--	--	**51.0**	--	--	**35.0**	--	--
YVD-04	YVD-04-151213	12/13/2015	N	59025351	0.200	U	--	0.250	UJ	MSD	**0.390**	--	--	--	--	--	--	--	--	--	--	--	**4.90**	--	--	**53.0**	--	--	**36.0**	--	--
YVD-04	YVD-04-160307	03/07/2016	N	59029521	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.60**	--	--	**51.0**	--	--	**34.0**	--	--
YVD-04	YVD-04-160620	6/20/2016	N	59037101	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.80**	--	--	**53.0**	--	--	**35.0**	J--	MSD
YVD-04	YVD-D1-160620	6/20/2016	FD	59037101	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.50**	--	--	**51.0**	--	--	**36.0**	J--	MSD
YVD-04	YVD-04-160928	9/28/2016	N	K1611629	0.100	U	--	0.500	U	--	--	--	--	**0.014**	--	--	--	--	--	--	--	--	**4.42**	--	--	**48.5**	--	--	**31.4**	--	--
YVD-04	YVD-04-D3-160928	9/28/2016	FD	K1611629	0.100	U	--	0.500	U	--	--	--	--	**0.008**	J	--	--	--	--	--	--	--	**4.49**	--	--	**49.9**	--	--	**32.2**	--	--
YVD-04	YVD-04-161213	12/13/2016	N	K1615045	0.100	U	--	0.500	U	--	--	--	--	**0.026**	--	--	--	--	--	--	--	--	**4.43**	--	--	**47.5**	--	--	**31.7**	--	--
YVD-04	YVD-031017-28	3/10/2017	N	K1702448	0.100	U	--	0.500	U	--	--	--	--	**0.018**	--	--	--	--	--	--	--	--	**4.25**	--	--	**46.7**	--	--	**32.9**	--	--
YVD-04	YVD-060517-11	6/5/2017	N	K1705702	0.100	U	--	0.500	U	--	--	--	--	**0.006**	J	--	--	--	--	--	--	--	**4.05**	--	--	**44.4**	--	--	**33.4**	--	--
YVD-04	YVD-092517-07	9/25/2017	N	K1710274	0.100	U	--	0.500	U	--	--	--	--	**0.026**	--	--	--	--	--	--	--	--	**4.62**	--	--	**51.1**	--	--	**32.7**	--	--
YVD-04	YVD-120417-13	12/4/2017	N	K1713091	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.013**	--	--	--	--	--	--	--	--	**4.29**	--	--	**49.9**	--	--	**32.5**	--	--
YVD-04	YVD-060418-21	6/4/2018	N	874662	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.46**	--	--	**51.0**	--	--	**30.4**	--	--
YVD-04	YVD-060219-05	6/2/2019	N	991939	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.52**	--	--	**49.0**	--	--	**30.6**	--	--
YVD-04	YVD-060820-05	6/8/2020	N	009144	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.32**	--	--	**49.8**	--	--	**30.5**	--	--
YVD-04	YVD-060821-22	6/8/2021	N	124212	0.050	U	--	1.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.32**	--	--	**47.4**	--	--	**29.5**	--	--
YVD-04	YVD-060622-17	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-04	YVD-061923-03	6/19/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-05	YVD-05-130917	09/17/2013	N	SWI0113	0.200	U	--	**0.435**	--	--	--	--	--	--	--	--	**1.62**	--	--	--	--	--	**6.95**	--	--	**46.2**	--	--	**76.8**	--	--
YVD-05	YVD-05-131211	12/11/2013	N	SWL0063	0.400	U	--	0.200	U	--	--	--	--	--	--	--	--	--	--	**0.462**	--	--	**3.33**	--	--	**45.5**	--	--	**68.4**	J--	MSD
YVD-05	YVD-05-140317	03/17/2014	N	SXC0081	0.400	U	--	0.250	U	--	**0.140**	--	--	--	--	--	--	--	--	--	--	--	**2.75**	--	--	**43.1**	--	--	**52.7**	--	--
YVD-05	YVD-05-140601	06/01/2014	N	SXF0008	0.400	U	--	0.250	U	--	**0.150**	--	--	--	--	--	--	--	--	--	--	--	**2.84**	--	--	**43.9**	--	--	**50.5**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-05	YVD-05-140922	09/22/2014	N	SXI0148	0.400	U	--	**0.259**	--	--	**0.200**	--	--	--	--	--	--	--	--	--	--	--	**2.75**	--	--	**45.1**	--	--	**48.1**	--	--
YVD-05	YVD-05-141215	12/15/2014	N	SXL0103	0.400	U	--	**0.272**	--	--	**0.290**	J	FDP	--	--	--	--	--	--	--	--	--	**4.21**	--	--	**45.5**	--	--	**27.7**	J+	MSD, FDP, DUP
YVD-05	YVD-D1-141215	12/15/2014	FD	SXL0103	0.200	U	--	**0.264**	--	--	**0.440**	J	FDP	--	--	--	--	--	--	--	--	--	**3.54**	--	--	**44.9**	--	--	**46.0**	J+	MSD, FDP, DUP
YVD-05	YVD-05-150316	03/16/2015	N	5904471	0.400	U	--	0.250	UJ	--	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**3.60**	--	--	**47.0**	--	--	**47.0**	--	--
YVD-05	YVD-05-150616	06/16/2015	N	59010751	0.400	U	--	0.250	UJ	--	**0.510**	--	--	--	--	--	--	--	--	--	--	--	**4.00**	J+	MSD	**47.0**	J+	MSD	**49.0**	J--	MSD
YVD-05	YVD-05-150922	09/22/2015	N	59020281	0.400	U	--	--	R	MSD	**0.800**	--	--	--	--	--	--	--	--	--	--	--	**4.90**	--	--	**51.0**	--	--	**51.0**	--	--
YVD-05	YVD-05-151214	12/14/2015	N	59025351	0.400	U	--	**0.600**	J--	MSD	**0.650**	--	--	--	--	--	--	--	--	--	--	--	**4.30**	--	--	**52.0**	--	--	**48.0**	--	--
YVD-05	YVD-05-160307	03/07/2016	N	59029521	0.400	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.60**	--	--	**48.0**	--	--	**47.0**	--	--
YVD-05	YVD-D1-160307	03/07/2016	FD	59029521	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.60**	--	--	**48.0**	--	--	**48.0**	--	--
YVD-05	YVD-05-160620	6/20/2016	N	59037151	0.400	U	--	0.250	U	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.40**	--	--	**48.0**	--	--	**49.0**	--	--
YVD-05	YVD-05-160928	9/28/2016	N	K1611698	0.100	U	--	--	R	MSD	--	--	--	**0.01**	--	--	--	--	--	--	--	--	**3.54**	--	--	**48.5**	--	--	**46.7**	--	--
YVD-05	YVD-05-161215	12/15/2016	N	K1615174	0.100	U	--	0.500	U	--	--	--	--	**0.04**	--	--	--	--	--	--	--	--	**3.37**	--	--	**46.5**	--	--	**49.0**	--	--
YVD-05	YVD-031317-32	3/13/2017	N	K1702489	0.100	U	--	0.500	U	--	--	--	--	**0.03**	--	--	--	--	--	--	--	--	**3.44**	--	--	**46.0**	--	--	**41.5**	--	--
YVD-05	YVD-031317-34	3/13/2017	FD	K1702489	0.100	U	--	0.500	U	--	--	--	--	**0.02**	--	--	--	--	--	--	--	--	**3.38**	--	--	**45.6**	--	--	**41.4**	--	--
YVD-05	YVD-060617-23	6/6/2017	N	K1705754	0.100	U	--	0.500	U	--	--	--	--	**0.016**	--	--	--	--	--	--	--	--	**3.51**	--	--	**48.1**	--	--	**48.0**	--	--
YVD-05	YVD-092517-09	9/25/2017	N	K1710274	0.100	U	--	0.500	U	--	--	--	--	**0.012**	--	--	--	--	--	--	--	--	**3.61**	--	--	**48.4**	--	--	**46.6**	--	--
YVD-05	YVD-120517-15	12/5/2017	N	K1713091	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.015**	--	--	--	--	--	--	--	--	**3.36**	--	--	**46.5**	--	--	**41.8**	--	--
YVD-05	YVD-060518-29	6/5/2018	N	874860	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.58**	--	--	**46.4**	--	--	**43.6**	--	--
YVD-05	YVD-060219-09	6/2/2019	N	991939	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.62**	--	--	**44.2**	--	--	**43.6**	--	--
YVD-05	YVD-060920-15	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.66**	--	--	**46.2**	--	--	**50.0**	--	--
YVD-05	YVD-060821-26	6/8/2021	N	124212	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.94**	--	--	**47.7**	--	--	**61.1**	--	--
YVD-05	YVD-060622-19	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-05	YVD-062023-09	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-06	YVD-06-130917	09/17/2013	N	SWI0113	0.200	U	--	**0.400**	--	--	--	--	--	--	--	--	**0.410**	--	--	--	--	--	**4.07**	--	--	**17.6**	--	--	**8.14**	--	--
YVD-06	YVD-06-131209	12/09/2013	N	SWL0055	0.200	U	--	**0.620**	J	FBK, MSD, FDP	--	--	--	--	--	--	--	--	--	0.060	U	--	**1.76**	--	--	**13.0**	J	FDP	**8.53**	--	--
YVD-06	YVD-D1-131209	12/09/2013	FD	SWL0055	2.00	U	--	**0.400**	J	FBK, MSD, FDP	--	--	--	--	--	--	--	--	--	0.060	U	--	**2.24**	--	--	**16.5**	J	FDP	**9.10**	--	--
YVD-06	YVD-06-140316	03/16/2014	N	SXC0081	0.200	U	--	**0.297**	--	--	**0.140**	--	--	--	--	--	--	--	--	--	--	--	**2.68**	--	--	**16.2**	--	--	**8.33**	--	--
YVD-06	YVD-D1-140316	03/16/2014	FD	SXC0081	0.200	U	--	0.250	U	--	**0.130**	--	--	--	--	--	--	--	--	--	--	--	**2.74**	--	--	**16.6**	--	--	**8.18**	--	--
YVD-06	YVD-06-140601	06/01/2014	N	SXF0008	0.200	U	--	0.250	U	--	**0.064**	--	--	--	--	--	--	--	--	--	--	--	**2.28**	--	--	**16.7**	--	--	**7.59**	--	--
YVD-06	YVD-D1-140601	06/01/2014	FD	SXF0008	0.200	U	--	0.250	U	--	**0.057**	--	--	--	--	--	--	--	--	--	--	--	**2.30**	--	--	**16.9**	--	--	**7.63**	--	--
YVD-06	YVD-06-140921	09/21/2014	N	SXI0148	0.200	U	--	**0.359**	--	--	**0.180**	--	--	--	--	--	--	--	--	--	--	--	**2.69**	--	--	**17.4**	--	--	**7.98**	--	--
YVD-06	YVD-06-141215	12/15/2014	N	SXL0103	0.200	U	--	0.250	U	--	0.100	U	--	--	--	--	--	--	--	--	--	--	**2.58**	--	--	**16.9**	--	--	**7.47**	J+	MSD, DUP
YVD-06	YVD-06-150316	03/16/2015	N	5904471	0.200	U	--	0.250	UJ	MSD	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**2.20**	--	--	**17.0**	--	--	**10.0**	--	--
YVD-06	YVD-06-150616	06/16/2015	N	59010751	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.20**	J+	MSD	**17.0**	J+	MSD	**7.90**	J--	MSD
YVD-06	YVD-06-150922	09/22/2015	N	59020141	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.10**	--	--	**17.0**	--	--	**7.90**	--	--
YVD-06	YVD-06-151214	12/14/2015	N	59025351	0.200	U	--	**0.570**	J--	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.40**	--	--	**18.0**	--	--	**8.00**	--	--
YVD-06	YVD-06-160307	03/07/2016	N	59029521	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.50**	--	--	**17.0**	--	--	**7.80**	--	--
YVD-06	YVD-06-160620	6/20/2016	N	59037151	0.200	U	--	**0.420**	--	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.30**	--	--	**17.0**	--	--	**8.10**	--	--
YVD-06	YVD-06-160929	9/29/2016	N	K1611704	0.100	U	--	0.500	U	--	--	--	--	**0.022**	--	--	--	--	--	--	--	--	**2.26**	--	--	**17.1**	--	--	**8.55**	--	--
YVD-06	YVD-06-161215	12/15/2016	N	K1615126	0.100	U	--	0.500	U	--	--	--	--	**0.010**	--	--	--	--	--	--	--	--	**2.12**	--	--	**17.1**	--	--	**10.2**	--	--
YVD-06	YVD-030617-04	3/6/2017	N	K1702228	0.100	U	--	0.500	U	FBK	--	--	--	**0.014**	--	--	--	--	--	--	--	--	**2.20**	--	--	**17.0**	--	--	**8.38**	--	--
YVD-06	YVD-060617-21	6/6/2017	N	K1705754	0.100	U	--	0.500	U	--	--	--	--	**0.010**	J	--	--	--	--	--	--	--	**2.17**	--	--	**16.3**	--	--	**8.44**	--	--
YVD-06	YVD-092617-17	9/26/2017	N	K1710333	0.100	U	--	0.500	U	--	--	--	--	**0.009**	J	--	--	--	--	--	--	--	**1.97**	--	--	**15.6**	--	--	**9.61**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-06	YVD-092617-18	9/26/2017	FD	K1710333	0.100	U	--	0.500	U	--	--	--	--	**0.010**	J	--	--	--	--	--	--	--	**2.03**	--	--	**16.1**	--	--	**9.58**	--	--
YVD-06	YVD-120517-17	12/5/2017	N	K1713091	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.021**	--	--	--	--	--	--	--	--	**2.11**	--	--	**17.3**	--	--	**9.87**	--	--
YVD-06	YVD-060318-15	6/3/2018	N	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.36**	--	--	**17.3**	--	--	**7.86**	--	--
YVD-06	YVD-060219-11	6/2/2019	N	991939	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.20**	--	--	**16.6**	--	--	**6.42**	--	--
YVD-06	YVD-060920-17	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.16**	--	--	**17.6**	--	--	**8.86**	--	--
YVD-06	YVD-060721-19	6/7/2021	N	124105	0.050	U	--	0.500	UJ	MS, RPD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.28**	--	--	**16.2**	--	--	**6.80**	--	--
YVD-06	YVD-062023-06	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-06	YVD-062023-07	6/20/2023	FD	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-07	YVD-07-130923	09/23/2013	N	SWI0178	--	--	--	**0.395**	--	--	--	--	--	--	--	--	**0.516**	--	--	--	--	--	**5.03**	--	--	**37.7**	--	--	--	--	--
YVD-07	YVD-07-130926	09/26/2013	N	SWI0190	0.200	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**37.4**	--	--
YVD-07	YVD-07-131210	12/10/2013	N	SWL0055	0.200	U	--	0.200	UJ	MSD	--	--	--	--	--	--	--	--	--	0.060	U	--	1.00	U	--	**40.4**	--	--	**50.0**	--	--
YVD-07	YVD-07-140316	03/16/2014	N	SXC0081	0.200	U	--	0.250	U	--	**0.220**	--	--	--	--	--	--	--	--	--	--	--	**4.45**	--	--	**42.5**	--	--	**69.2**	--	--
YVD-07	YVD-07-140604	06/04/2014	N	SXF0025	0.400	U	--	**0.348**	J--	MSD	**0.690**	--	--	--	--	--	--	--	--	--	--	--	**5.57**	--	--	**44.5**	--	--	**57.0**	--	--
YVD-07	YVD-07-140922	09/22/2014	N	SXI0158	0.400	U	--	0.250	U	--	**0.200**	--	--	--	--	--	--	--	--	--	--	--	**4.05**	--	--	**42.7**	J+	MSD	**51.8**	--	--
YVD-07	YVD-07-141216	12/16/2014	N	SXL0108	0.400	U	--	0.250	U	--	0.100	U	--	--	--	--	--	--	--	--	--	--	**3.83**	--	--	**40.6**	--	--	**51.2**	--	--
YVD-07	YVD-07-150316	03/16/2015	N	5904541	0.400	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.30**	--	--	**50.0**	--	--	**73.0**	J--	MSD
YVD-07	YVD-D2-150316	03/16/2015	FD	5904541	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.30**	--	--	**48.0**	--	--	**70.0**	J--	MSD
YVD-07	YVD-07-150616	06/16/2015	N	59010751	0.400	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.20**	J+	MSD	**43.0**	J+	MSD	**74.0**	J--	MSD
YVD-07	YVD-D1-150616	06/16/2015	FD	59010751	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.20**	J+	MSD	**44.0**	J+	MSD	**74.0**	J--	MSD
YVD-07	YVD-07-150923	09/23/2015	N	59020281	0.400	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.20**	--	--	**48.0**	--	--	**68.0**	--	--
YVD-07	YVD-07-151214	12/14/2015	N	59025431	0.400	U	--	--	R	MSD	**0.970**	J	FDP	--	--	--	--	--	--	--	--	--	**4.50**	--	--	**48.0**	--	--	**59.0**	--	--
YVD-07	YVD-07-160308	03/08/2016	N	59029711	0.400	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.00**	--	--	**42.0**	--	--	**49.0**	J+	MSD
YVD-07	YVD-07-160621	6/21/2016	N	59037151	0.400	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.50**	--	--	**37.0**	--	--	**31.0**	--	--
YVD-07	YVD-07-160929	9/29/2016	N	K1611704	0.100	U	--	0.500	U	--	--	--	--	**0.020**	--	--	--	--	--	--	--	--	**3.31**	--	--	**34.0**	--	--	**37.1**	--	--
YVD-07	YVD-07-161213	12/13/2016	N	K1615083	0.100	U	--	0.500	U	--	--	--	--	**0.010**	J	--	--	--	--	--	--	--	**3.59**	--	--	**36.6**	--	--	**64.0**	--	--
YVD-07	YVD-030717-07	3/7/2017	N	K1702324	0.100	UJ	HTQ	0.500	U	--	--	--	--	**0.019**	--	--	--	--	--	--	--	--	**2.83**	--	--	**31.4**	--	--	**25.4**	--	--
YVD-07	YVD-060517-15	6/5/2017	N	K1705754	0.100	U	--	0.500	U	--	--	--	--	**0.004**	J	--	--	--	--	--	--	--	**2.98**	--	--	**32.9**	--	--	**33.5**	--	--
YVD-07	YVD-092617-21	9/26/2017	N	K1710333	0.100	U	--	0.500	U	--	--	--	--	**0.022**	--	--	--	--	--	--	--	--	**3.26**	--	--	**34.0**	--	--	**51.0**	--	--
YVD-07	YVD-120417-11	12/4/2017	N	K1713026	0.100	U	--	0.500	U	--	--	--	--	**0.022**	--	--	--	--	--	--	--	--	**3.56**	--	--	**36.1**	--	--	**56.5**	--	--
YVD-07	YVD-060418-23	6/4/2018	N	874662	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.76**	--	--	**39.4**	--	--	**63.5**	--	--
YVD-07	YVD-060319-16	6/3/2019	N	992053	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.76**	--	--	**35.8**	--	--	**27.6**	--	--
YVD-07	YVD-060920-27	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.27**	--	--	**41.8**	--	--	**62.9**	--	--
YVD-07	YVD-060821-34	6/8/2021	N	124212	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.28**	--	--	**37.6**	--	--	**40.8**	--	--
YVD-07	YVD-060622-21	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-07	YVD-060622-22	6/6/2022	FD	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-07	YVD-062023-19	6/20/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-08	YVD-08-130919	09/19/2013	N	SWI0138	2.00	U	--	**0.935**	J+	FBK	--	--	--	--	--	--	0.100	U	--	--	--	--	**6.03**	--	--	**88.3**	--	--	**105**	--	--
YVD-08	YVD-08-131211	12/11/2013	N	SWL0063	2.00	U	--	0.750	U	ERL	--	--	--	--	--	--	--	--	--	**1.46**	--	--	**7.55**	--	--	**82.2**	--	--	**273**	J--	MSD
YVD-08	YVD-08-140317	03/17/2014	N	SXC0095	2.00	U	--	**0.702**	--	--	**0.130**	--	--	--	--	--	--	--	--	--	--	--	**5.30**	--	--	**75.1**	--	--	**173**	J--	MSD
YVD-08	YVD-08-140602	06/02/2014	N	SXF0017	0.800	U	--	**1.12**	--	--	**2.70**	--	--	--	--	--	--	--	--	--	--	--	**11.2**	--	--	**78.3**	--	--	**175**	J--	MSD
YVD-08	YVD-08-140923	09/23/2014	N	SXI0173	1.00	U	--	**0.867**	J+	MSD	**0.350**	--	--	--	--	--	--	--	--	--	--	--	**5.87**	--	--	**76.9**	--	--	**107**	--	--
YVD-08	YVD-08-141216	12/16/2014	N	SXL0108	1.00	U	--	**0.369**	--	--	**0.340**	--	--	--	--	--	--	--	--	--	--	--	**5.92**	--	--	**77.2**	--	--	**140**	--	--
YVD-08	YVD-08-150317	03/17/2015	N	5904541	1.00	U	--	**0.390**	J--	MSD	**0.670**	--	--	--	--	--	--	--	--	--	--	--	**5.90**	--	--	**77.0**	--	--	**130**	J--	MSD
YVD-08	YVD-D3-150317	03/17/2015	FD	5904541	0.200	U	--	0.250	UJ	MSD	**0.490**	--	--	--	--	--	--	--	--	--	--	--	**5.70**	--	--	**76.0**	--	--	**150**	J--	MSD
YVD-08	YVD-08-150617	06/17/2015	N	59010961	1.00	U	--	**0.260**	J--	MSD, FDP	**0.530**	--	--	--	--	--	--	--	--	--	--	--	**6.00**	J+	MSD	**82.0**	J+	MSD	**140**	--	--
YVD-08	YVD-D3-150617	06/17/2015	FD	59010961	0.200	U	--	**0.860**	J--	MSD, FDP	**0.390**	--	--	--	--	--	--	--	--	--	--	--	**5.70**	J+	MSD	**77.0**	J+	MSD	**170**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-08	YVD-08-150924	09/24/2015	N	59020391	1.00	U	--	0.250	UJ	MSD	**0.310**	--	--	--	--	--	--	--	--	--	--	--	**5.60**	--	--	**82.0**	--	--	**170**	J--	MSD
YVD-08	YVD-08-151215	12/15/2015	N	59025501	1.00	U	--	--	R	MSD	**0.330**	J--	MSD	--	--	--	--	--	--	--	--	--	**6.20**	--	--	**85.0**	--	--	**190**	--	--
YVD-08	YVD-D3-151215	12/15/2015	FD	59025501	0.200	U	--	--	R	MSD	**0.270**	J--	MSD	--	--	--	--	--	--	--	--	--	**6.20**	--	--	**85.0**	--	--	**180**	--	--
YVD-08	YVD-08-160310	03/10/2016	N	59029941	1.00	U	--	0.250	UJ	FDP, MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**5.60**	--	--	**87.0**	--	--	**210**	J	DUP
YVD-08	YVD-08-160622	6/22/2016	N	59037271	1.00	U	--	--	R	MSD	**0.310**	--	--	--	--	--	--	--	--	--	--	--	**5.90**	--	--	**87.0**	--	--	**200**	--	--
YVD-08	YVD-D3-160622	6/22/2016	FD	59037271	0.200	U	--	--	R	MSD	**0.280**	--	--	--	--	--	--	--	--	--	--	--	**6.00**	--	--	**88.0**	--	--	**200**	--	--
YVD-08	YVD-08-160927	9/27/2016	N	K1611565	0.100	U	--	--	R	MSD	--	--	--	**0.049**	--	--	--	--	--	--	--	--	**4.95**	--	--	**84.7**	--	--	**193**	--	--
YVD-08	YVD-08-161213	12/13/2016	N	K1615045	0.100	U	--	0.500	U	--	--	--	--	**0.058**	--	--	--	--	--	--	--	--	**5.10**	--	--	**84.5**	--	--	**182**	--	--
YVD-08	YVD-030917-24	3/9/2017	N	K1702448	0.100	U	--	0.500	U	--	--	--	--	**0.018**	--	--	--	--	--	--	--	--	**4.95**	--	--	**83.4**	--	--	**203**	--	--
YVD-08	YVD-060717-29	6/7/2017	N	K1705833	0.100	U	--	0.500	U	--	--	--	--	**0.025**	--	--	--	--	--	--	--	--	**5.13**	--	--	**92.1**	--	--	**194**	--	--
YVD-08	YVD-092617-19	9/26/2017	N	K1710333	0.100	U	--	0.500	U	--	--	--	--	**0.01**	--	--	--	--	--	--	--	--	**5.12**	--	--	**89.3**	--	--	**213**	--	--
YVD-08	YVD-120517-23	12/5/2017	N	K1713157	0.100	U	--	0.500	U	--	--	--	--	**0.013**	--	--	--	--	--	--	--	--	**5.23**	--	--	**93.2**	--	--	**184**	--	--
YVD-08	YVD-031918-15	3/19/2018	N	870634	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.40**	--	--	**90.5**	--	--	**183**	--	--
YVD-08	YVD-060518-31	6/5/2018	N	874860	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.55**	--	--	**98.0**	--	--	**197**	--	--
YVD-08	YVD-090918-04	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.70**	--	--	**99.5**	--	--	**195**	--	--
YVD-08	YVD-121118-19	12/11/2018	N	884939	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**6.00**	--	--	**98.5**	--	--	**207**	--	--
YVD-08	YVD-031719-03	3/17/2019	N	988239	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.50**	--	--	**96.0**	--	--	**203**	--	--
YVD-08	YVD-060319-21	6/3/2019	N	992053	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.55**	--	--	**97.5**	--	--	**190**	--	--
YVD-08	YVD-090919-02	9/9/2019	N	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.45**	--	--	**91.5**	--	--	**184**	--	--
YVD-08	YVD-120919-02	12/9/2019	N	902276	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.55**	--	--	**96.5**	J	MSD	**177**	--	--
YVD-08	YVD-120919-04	12/9/2019	FD	902276	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.55**	--	--	**96.0**	J	MSD	**173**	--	--
YVD-08	YVD-033120-17	3/31/2020	N	006260	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.35**	--	--	**99.0**	--	--	**184**	--	--
YVD-08	YVD-060920-23	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.50**	--	--	**106**	--	--	**176**	--	--
YVD-08	YVD-092120-11	9/21/2020	N	013896	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.60**	--	--	**104**	--	--	**179**	--	--
YVD-08	YVD-120720-11	12/7/2020	N	017035	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**6.05**	--	--	**104**	--	--	**174**	--	--
YVD-08	YVD-030121-07	3/1/2021	N	119931	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.55**	--	--	**102**	--	--	**177**	--	--
YVD-08	YVD-060821-28	6/8/2021	N	124212	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.45**	--	--	**102**	--	--	**179**	--	--
YVD-08	YVD-121521-20	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-08	YVD-031522-12	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-08	YVD-060722-27	6/7/2022	N	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-08	YVD-091322-05	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-08	YVD-122722-19	12/27/2022	N	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-08	YVD-030623-13	3/6/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-08	YVD-062123-28	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-09	YVD-09-130919	09/19/2013	N	SWI0138	2.00	U	--	--	R	FBK	--	--	--	--	--	--	--	R	FBK	--	--	--	**8.21**	--	--	**189**	--	--	**236**	--	--
YVD-09	YVD-09-131212	12/12/2013	N	SWL0078	2.00	U	--	0.661	U	ERL	--	--	--	--	--	--	--	--	--	**0.647**	--	--	**9.21**	--	--	**176**	--	--	**193**	--	--
YVD-09	YVD-09-140319	03/19/2014	N	SXC0107	2.00	U	--	**0.653**	J--	MSD	**0.530**	--	--	--	--	--	--	--	--	--	--	--	**9.33**	--	--	**173**	--	--	**214**	--	--
YVD-09	YVD-09-140603	06/03/2014	N	SXF0025	2.00	U	--	**0.613**	J--	MSD	**0.720**	--	--	--	--	--	--	--	--	--	--	--	**10.1**	--	--	**193**	--	--	**214**	--	--
YVD-09	YVD-09-140924	09/24/2014	N	SXI0173	2.00	U	--	**0.502**	J+	MSD	**0.320**	J+	FBK	--	--	--	--	--	--	--	--	--	**8.88**	--	--	**203**	--	--	**166**	--	--
YVD-09	YVD-09-141217	12/17/2014	N	SXL0121	2.00	U	--	0.250	UJ	MSD	**1.30**	--	--	--	--	--	--	--	--	--	--	--	**12.9**	--	--	**187**	--	--	**223**	--	--
YVD-09	YVD-09-150318	03/18/2015	N	5904651	2.00	U	--	0.250	UJ	MSD	**0.380**	--	--	--	--	--	--	--	--	--	--	--	**9.30**	J--	MSD	**190**	--	--	**190**	--	--
YVD-09	YVD-09-150617	06/17/2015	N	59010961	2.00	U	--	**0.370**	J--	MSD	**0.360**	--	--	--	--	--	--	--	--	--	--	--	**9.80**	J+	MSD	**190**	J+	MSD	**230**	--	--
YVD-09	YVD-09-150923	09/23/2015	N	59020391	0.200	U	--	**0.260**	J--	MSD	**0.270**	--	--	--	--	--	--	--	--	--	--	--	**9.60**	--	--	**180**	--	--	**270**	J--	MSD
YVD-09	YVD-09-151215	12/15/2015	N	59025501	2.00	U	--	--	R	MSD	**0.250**	J--	MSD	--	--	--	--	--	--	--	--	--	**9.60**	--	--	**190**	--	--	**250**	--	--
YVD-09	YVD-09-160310	03/10/2016	N	59029941	2.00	U	--	0.250	UJ	FDP, MSD	**0.330**	--	--	--	--	--	--	--	--	--	--	--	**9.20**	--	--	**190**	--	--	**250**	J	DUP
YVD-09	YVD-09-160622	6/22/2016	N	59037271	2.00	U	--	--	R	MSD	**0.290**	--	--	--	--	--	--	--	--	--	--	--	**8.90**	--	--	**190**	--	--	**260**	--	--
YVD-09	YVD-09-160929	9/29/2016	N	K1611704	0.100	U	--	0.500	U	--	--	--	--	**0.016**	--	--	--	--	--	--	--	--	**7.62**	--	--	**184**	--	--	**243**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-09	YVD-09-161213	12/13/2016	N	K1615045	0.100	U	--	0.500	U	--	--	--	--	**0.048**	--	--	--	--	--	--	--	--	**8.42**	--	--	**185**	--	--	**238**	--	--
YVD-09	YVD-D2-161213	12/13/2016	FD	K1615045	0.100	U	--	0.500	U	--	--	--	--	**0.078**	--	--	--	--	--	--	--	--	**8.04**	--	--	**181**	--	--	**240**	--	--
YVD-09	YVD-031317-35	3/13/2017	N	K1702489	**0.040**	J	--	0.500	U	--	--	--	--	**0.025**	--	--	--	--	--	--	--	--	**7.78**	--	--	**185**	--	--	**225**	--	--
YVD-09	YVD-060517-08	6/5/2017	N	K1705702	0.100	U	--	0.500	U	--	--	--	--	**0.007**	J	--	--	--	--	--	--	--	**6.98**	--	--	**163**	--	--	**237**	--	--
YVD-09	YVD-092617-29	9/26/2017	N	K1710381	0.100	U	--	0.500	U	--	--	--	--	**0.029**	--	--	--	--	--	--	--	--	**8.07**	--	--	**175**	--	--	**223**	--	--
YVD-09	YVD-092617-30	9/26/2017	FD	K1710381	0.100	U	--	0.500	U	--	--	--	--	**0.039**	--	--	--	--	--	--	--	--	**8.11**	--	--	**176**	--	--	**224**	--	--
YVD-09	YVD-120517-21	12/5/2017	N	K1713091	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.009**	J	--	--	--	--	--	--	--	**7.27**	--	--	**174**	--	--	**211**	--	--
YVD-09	YVD-031918-18	3/19/2018	N	870634	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**7.80**	--	--	**166**	--	--	**180**	--	--
YVD-09	YVD-060318-13	6/3/2018	N	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**8.35**	--	--	**182**	--	--	**182**	--	--
YVD-09	YVD-090918-06	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**8.10**	--	--	**174**	--	--	**172**	--	--
YVD-09	YVD-121118-15	12/11/2018	N	884939	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**8.60**	--	--	**172**	--	--	**166**	--	--
YVD-09	YVD-121118-17	12/11/2018	FD	884939	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**8.75**	--	--	**175**	--	--	**170**	--	--
YVD-09	YVD-031719-05	3/17/2019	N	988239	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**8.05**	--	--	**166**	--	--	**162**	--	--
YVD-09	YVD-060319-15	6/3/2019	N	992053	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**8.00**	--	--	**166**	--	--	**146**	--	--
YVD-09	YVD-090919-04	9/9/2019	N	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**8.20**	--	--	**160**	--	--	**148**	--	--
YVD-09	YVD-120919-06	12/9/2019	N	902276	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U		**8.40**	--	--	**166**	J	MSD	**143**	--	--
YVD-09	YVD-033020-05	3/30/2020	N	006241	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**7.95**	--	--	**163**	--	--	**150**	--	--
YVD-09	YVD-060920-24	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**7.90**	--	--	**167**	--	--	**158**	--	--
YVD-09	YVD-092120-16	9/21/2020	N	013896	0.050	U	--	2.50	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**7.85**	--	--	**164**	--	--	**151**	--	--
YVD-09	YVD-120720-13	12/7/2020	N	017035	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**8.65**	--	--	**164**	--	--	**159**	--	--
YVD-09	YVD-030121-05	3/1/2021	N	119931	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**8.05**	--	--	**161**	--	--	**152**	--	--
YVD-09	YVD-060721-18	6/7/2021	N	124105	0.050	U	--	5.00	UJ	MS, RPD	--	--	--	--	--	--	--	--	--	0.070	U	--	**8.15**	--	--	**157**	--	--	**135**	--	--
YVD-09	YVD-121421-09	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-09	YVD-031522-14	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-09	YVD-060622-12	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-09	YVD-091322-07	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-09	YVD-120822-15	12/8/2022	N	K2214578	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-09	YVD-030623-19	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-09	YVD-062123-30	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-10	YVD-10-130917	09/17/2013	N	SWI0123	2.00	U	--	0.250	U	--	--	--	--	--	--	--	**0.148**	--	--	--	--	--	**3.28**	--	--	**104**	--	--	**199**	--	--
YVD-10	YVD-10-131212	12/12/2013	N	SWL0078	2.00	U	--	0.650	U	ERL	--	--	--	--	--	--	--	--	--	**1.40**	--	--	**4.49**	--	--	**102**	--	--	**174**	--	--
YVD-10	YVD-10-140319	03/19/2014	N	SXC0107	2.00	U	--	**0.507**	J--	MSD	**0.770**	--	--	--	--	--	--	--	--	--	--	--	**3.93**	--	--	**96.8**	--	--	**163**	--	--
YVD-10	YVD-10-140603	06/03/2014	N	SXF0025	2.00	U	--	**0.577**	J--	MSD	**0.800**	--	--	--	--	--	--	--	--	--	--	--	**4.07**	--	--	**103**	--	--	**188**	--	--
YVD-10	YVD-10-140924	09/24/2014	N	SXI0173	2.00	U	--	**0.443**	J+	MSD	**0.480**	J+	FBK	--	--	--	--	--	--	--	--	--	**3.86**	--	--	**116**	--	--	**217**	--	--
YVD-10	YVD-10-141217	12/17/2014	N	SXL0144	2.00	U	--	--	R	MSD	**0.690**	J--	MSD	--	--	--	--	--	--	--	--	--	**3.88**	--	--	**110**	--	--	**180**	--	--
YVD-10	YVD-10-150318	03/18/2015	N	5904651	2.00	U	--	0.250	UJ	MSD	**0.420**	--	--	--	--	--	--	--	--	--	--	--	**4.00**	J--	MSD	**130**	--	--	**370**	--	--
YVD-10	YVD-10-150617	06/17/2015	N	59010961	2.00	U	--	**0.440**	J--	MSD	**0.720**	--	--	--	--	--	--	--	--	--	--	--	**4.60**	J+	MSD	**130**	J+	MSD	**110**	--	--
YVD-10	YVD-10-150923	09/23/2015	N	59020391	2.00	U	--	0.250	UJ	MSD	**0.560**	--	--	--	--	--	--	--	--	--	--	--	**4.30**	--	--	**120**	--	--	**370**	J--	MSD
YVD-10	YVD-10-151214	12/14/2015	N	59025351	2.00	U	--	0.250	UJ	MSD	**0.580**	--	--	--	--	--	--	--	--	--	--	--	**4.30**	--	--	**120**	--	--	**360**	--	--
YVD-10	YVD-10-160309	03/09/2016	N	59029711	2.00	U	--	--	R	MSD	**0.420**	--	--	--	--	--	--	--	--	--	--	--	**4.10**	--	--	**120**	--	--	**280**	J+	MSD
YVD-10	YVD-10-160621	6/21/2016	N	59037271	2.00	U	--	--	R	MSD	**0.710**	--	--	--	--	--	--	--	--	--	--	--	**4.50**	--	--	**110**	--	--	**240**	--	--
YVD-10	YVD-10-160929	9/29/2016	N	K1611698	0.100	U	--	--	R	MSD	--	--	--	**0.028**	--	--	--	--	--	--	--	--	**2.48**	--	--	**114**	--	--	**223**	--	--
YVD-10	YVD-10-161212	12/12/2016	N	K1615029	0.100	U	--	0.500	U	--	--	--	--	**0.074**	--	--	--	--	--	--	--	--	**2.68**	--	--	**118**	--	--	**191**	--	--
YVD-10	YVD-030917-27	3/9/2017	N	K1702448	0.100	U	--	0.500	U	--	--	--	--	**0.066**	--	--	--	--	--	--	--	--	**2.89**	--	--	**133**	--	--	**799**	--	--
YVD-10	YVD-060617-22	6/6/2017	N	K1705754	0.100	U	--	0.500	U	--	--	--	--	**0.036**	--	--	--	--	--	--	--	--	**2.57**	--	--	**119**	--	--	**368**	--	--
YVD-10	YVD-092617-31	9/26/2017	N	K1710381	0.100	U	--	0.500	U	--	--	--	--	**0.011**	--	--	--	--	--	--	--	--	**2.56**	--	--	**111**	--	--	**265**	--	--
YVD-10	YVD-120517-30	12/5/2017	N	K1713091	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.023**	--	--	--	--	--	--	--	--	**2.37**	--	--	**114**	--	--	**224**	--	--
YVD-10	YVD-031818-06	3/18/2018	N	870610	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.60**	--	--	**123**	--	--	**202**	--	--
YVD-10	YVD-060318-06	6/3/2018	N	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.93**	--	--	**118**	--	--	**208**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-10	YVD-090918-13	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.58**	--	--	**114**	--	--	**238**	--	--
YVD-10	YVD-121018-08	12/10/2018	N	884857	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.64**	--	--	**112**	--	--	**196**	--	--
YVD-10	YVD-031819-16	3/18/2019	N	988273	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	**0.070**	--	--	**2.62**	--	--	**108**	--	--	**196**	--	--
YVD-10	YVD-060319-18	6/3/2019	N	992053	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.56**	--	--	**106**	--	--	**220**	--	--
YVD-10	YVD-091019-20	9/10/2019	N	998438	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.49**	--	--	**104**	--	--	**165**	--	--
YVD-10	YVD-121019-21	12/10/2019	N	902321	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.94**	--	--	**102**	--	--	**199**	--	--
YVD-10	YVD-033020-08	3/30/2020	N	006241	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.64**	--	--	**100**	--	--	**183**	--	--
YVD-10	YVD-060920-12	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.71**	--	--	**108**	--	--	**224**	--	--
YVD-10	YVD-092020-08	9/20/2020	N	013864	0.050	U	--	0.500	U	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.73**	--	--	**102**	--	--	**229**	--	--
YVD-10	YVD-120720-12	12/7/2020	N	017035	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.24**	--	--	**106**	--	--	**288**	--	--
YVD-10	YVD-030121-12	3/1/2021	N	119931	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.34**	--	--	**134**	--	--	**896**	--	--
YVD-10	YVD-060621-07	6/6/2021	N	124053	0.050	U	--	5.00	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.80**	--	--	**106**	--	--	**219**	--	--
YVD-10	YVD-121421-06	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-10	YVD-031422-06	3/14/2022	N	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-10	YVD-060522-06	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-10	YVD-091422-20	9/14/2022	N	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-10	YVD-120722-11	12/7/2022	N	K2214479	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-10	YVD-030623-10	3/6/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-10	YVD-062123-26	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-11	YVD-11-130923	09/23/2013	N	SWI0178	--	--	--	0.250	U	--	--	--	--	--	--	--	0.100	UJ	FDP	--	--	--	**5.44**	J	FDP	**23.2**	--	--	--	--	--
YVD-11	YVD-D2-130923	09/23/2013	FD	SWI0178	--	--	--	0.250	U	--	--	--	--	--	--	--	**0.753**	J	FDP	--	--	--	**3.60**	J	FDP	**23.0**	--	--	--	--	--
YVD-11	YVD-11-130926	09/26/2013	N	SWI0190	2.00	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**207**	--	--
YVD-11	YVD-D3-130926	09/26/2013	FD	SWI0190	2.00	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**228**	--	--
YVD-11	YVD-11-131212	12/12/2013	N	SWL0073	2.00	U	--	0.200	UJ	MSD	--	--	--	--	--	--	--	--	--	**0.245**	--	--	**3.37**	--	--	**23.2**	--	--	**208**	--	--
YVD-11	YVD-11-140318	03/18/2014	N	SXC0107	2.00	U	--	**0.503**	J--	MSD	**0.170**	--	--	--	--	--	--	--	--	--	--	--	**3.15**	--	--	**22.2**	--	--	**193**	--	--
YVD-11	YVD-11-140603	06/03/2014	N	SXF0017	2.00	U	--	**0.564**	--	--	**0.840**	--	--	--	--	--	--	--	--	--	--	--	**5.38**	--	--	**26.1**	--	--	**203**	J--	MSD
YVD-11	YVD-11-140924	09/24/2014	N	SXI0173	1.00	U	--	**0.453**	J+	MSD	**0.170**	J+	FBK	--	--	--	--	--	--	--	--	--	**3.86**	--	--	**25.6**	--	--	**159**	--	--
YVD-11	YVD-11-141217	12/17/2014	N	SXL0121	2.00	U	--	0.250	UJ	MSD	**0.460**	--	--	--	--	--	--	--	--	--	--	--	**4.77**	--	--	**25.6**	--	--	**158**	--	--
YVD-11	YVD-11-150317	03/17/2015	N	5904651	2.00	U	--	0.250	UJ	MSD	**0.300**	--	--	--	--	--	--	--	--	--	--	--	**4.30**	J--	MSD	**26.0**	--	--	**150**	--	--
YVD-11	YVD-11-150616	06/16/2015	N	59010961	2.00	U	--	**0.310**	J--	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.20**	J+	MSD	**27.0**	J+	MSD	**140**	--	--
YVD-11	YVD-11-150923	09/23/2015	N	59020281	2.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.40**	--	--	**25.0**	--	--	**130**	--	--
YVD-11	YVD-11-151215	12/15/2015	N	59025431	2.00	U	--	--	R	MSD	**0.590**	J	FDP	--	--	--	--	--	--	--	--	--	**5.20**	--	--	**25.0**	--	--	**140**	--	--
YVD-11	YVD-D2-151215	12/15/2015	FD	59025431	0.200	U	--	--	R	MSD	**1.50**	J	FDP	--	--	--	--	--	--	--	--	--	**4.90**	--	--	**25.0**	--	--	**130**	--	--
YVD-11	YVD-11-160309	03/09/2016	N	59029711	2.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.30**	--	--	**25.0**	--	--	**140**	J+	MSD
YVD-11	YVD-11-160621	6/21/2016	N	59037151	2.00	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.50**	--	--	**27.0**	--	--	**130**	--	--
YVD-11	YVD-11-160927	9/27/2016	N	K1611629	0.100	U	--	0.500	U	--	--	--	--	**0.071**	--	--	--	--	--	--	--	--	**3.13**	--	--	**26.1**	--	--	**100**	--	--
YVD-11	YVD-11-161214	12/14/2016	N	K1615126	0.100	U	--	0.500	U	--	--	--	--	**0.421**	--	--	--	--	--	--	--	--	**4.82**	--	--	**25.6**	--	--	**104**	--	--
YVD-11	YVD-031317-37	3/13/2017	N	K1702489	**0.060**	J	--	0.500	U	--	--	--	--	**0.016**	--	--	--	--	--	--	--	--	**3.02**	--	--	**25.5**	--	--	**99.8**	--	--
YVD-11	YVD-060517-10	6/5/2017	N	K1705702	0.100	U	--	0.500	U	--	--	--	--	**0.029**	--	--	--	--	--	--	--	--	**2.98**	--	--	**24.9**	--	--	**133**	--	--
YVD-11	YVD-092617-26	9/26/2017	N	K1710381	0.100	UJ	HTQ	0.500	U	--	--	--	--	**0.006**	J	--	--	--	--	--	--	--	**3.24**	--	--	**28.8**	--	--	**219**	--	--
YVD-11	YVD-120417-06	12/4/2017	N	K1713026	0.100	U	--	0.500	U	--	--	--	--	0.015	U	MBK	--	--	--	--	--	--	**2.78**	--	--	**25.8**	--	--	**124**	--	--
YVD-11	YVD-031918-12	3/19/2018	N	870634	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.98**	--	--	**26.0**	--	--	**103**	--	--
YVD-11	YVD-031918-14	3/19/2018	FD	870634	0.050	U	--	--	--	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.94**	--	--	**25.8**	--	--	**100**	--	--
YVD-11	YVD-060418-14	6/4/2018	N	874662	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.26**	--	--	**28.4**	--	--	**91.2**	--	--
YVD-11	YVD-060418-16	6/4/2018	FD	874662	0.050	U	--	**0.600**	J	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.28**	--	--	**28.9**	--	--	**90.0**	--	--
YVD-11	YVD-090918-05	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.05**	--	--	**28.2**	--	--	**90.6**	--	--
YVD-11	YVD-121018-10	12/10/2018	N	884857	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.88**	--	--	**27.4**	--	--	**75.4**	--	--
YVD-11	YVD-031819-18	3/18/2019	N	988273	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.76**	--	--	**26.2**	--	--	**60.4**	--	--
YVD-11	YVD-060219-02	6/2/2019	N	991939	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.60**	--	--	**25.4**	--	--	**58.2**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-11	YVD-060219-04	6/2/2019	FD	991939	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.68**	--	--	**25.6**	--	--	**58.4**	--	--
YVD-11	YVD-090919-05	9/9/2019	N	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.66**	--	--	**27.2**	--	--	**60.4**	--	--
YVD-11	YVD-120919-13	12/9/2019	N	902276	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.76**	--	--	**29.6**	J	MSD	**57.2**	--	--
YVD-11	YVD-033020-10	3/30/2020	N	006241	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.68**	--	--	**29.8**	--	--	**55.5**	--	--
YVD-11	YVD-061020-31	6/10/2020	N	009361	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.64**	--	--	**31.0**	--	--	**48.8**	--	--
YVD-11	YVD-092120-20	9/21/2020	N	013896	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.70**	--	--	**33.4**	--	--	**60.3**	--	--
YVD-11	YVD-120720-10	12/7/2020	N	017035	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.05**	--	--	**36.4**	--	--	**52.8**	--	--
YVD-11	YVD-030121-06	3/1/2021	N	119931	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.94**	--	--	**37.6**	--	--	**56.0**	--	--
YVD-11	YVD-060821-23	6/8/2021	N	124212	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.80**	--	--	**35.6**	--	--	**36.0**	--	--
YVD-11	YVD-121421-05	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-11	YVD-031522-19	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-11	YVD-060622-18	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-11	YVD-091422-21	9/14/2022	N	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-11	YVD-120622-06	12/6/2022	N	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-11	YVD-030623-21	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-11	YVD-062123-24	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-12	YVD-12-130919	09/19/2013	N	SWI0142	--	--	--	--	R	FBK	--	--	--	--	--	--	**0.356**	J+	FBK	--	--	--	**3.14**	--	--	**77.3**	--	--	**245**	--	--
YVD-12	YVD-12-130925	09/25/2013	N	SWI0175	2.00	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-12	YVD-12-131211	12/11/2013	N	SWL0073	2.00	U	--	--	R	MSD, FBK	--	--	--	--	--	--	--	--	--	**0.218**	--	--	**3.63**	--	--	**73.2**	--	--	**262**	--	--
YVD-12	YVD-12-140318	03/18/2014	N	SXC0095	2.00	U	--	**0.564**	--	--	**0.220**	--	--	--	--	--	--	--	--	--	--	--	**3.27**	--	--	**73.4**	--	--	**236**	J--	MSD
YVD-12	YVD-12-140603	06/03/2014	N	SXF0017	0.200	U	--	**0.415**	--	--	**0.280**	J+	FBK	--	--	--	--	--	--	--	--	--	**2.96**	--	--	**70.7**	--	--	**21.3**	J--	MSD
YVD-12	YVD-12-140922	09/22/2014	N	SXI0148	2.00	U	--	**0.669**	--	--	**0.250**	--	--	--	--	--	--	--	--	--	--	--	**3.13**	--	--	**77.9**	--	--	**200**	--	--
YVD-12	YVD-D2-140922	09/22/2014	FD	SXI0148	0.800	U	--	**0.653**	--	--	**0.200**	--	--	--	--	--	--	--	--	--	--	--	**3.00**	--	--	**77.8**	--	--	**200**	--	--
YVD-12	YVD-12-141216	12/16/2014	N	SXL0121	2.00	U	--	0.250	UJ	MSD	**0.250**	--	--	--	--	--	--	--	--	--	--	--	**3.23**	--	--	**71.8**	--	--	**228**	--	--
YVD-12	YVD-12-150317	03/17/2015	N	5904541	2.00	U	--	**0.560**	J--	MSD	**0.310**	--	--	--	--	--	--	--	--	--	--	--	**3.60**	--	--	**73.0**	--	--	**190**	J--	MSD
YVD-12	YVD-12-150617	06/17/2015	N	59010961	2.00	U	--	**0.350**	J--	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.60**	J+	MSD	**83.0**	J+	MSD	**180**	--	--
YVD-12	YVD-12-150924	09/24/2015	N	59020391	2.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.50**	--	--	**73.0**	--	--	**210**	J--	MSD
YVD-12	YVD-12-151216	12/16/2015	N	59025501	2.00	U	--	**0.580**	J--	MSD	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**3.10**	--	--	**74.0**	--	--	**180**	--	--
YVD-12	YVD-12-160309	03/09/2016	N	59029941	2.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.60**	--	--	**73.0**	--	--	**170**	J	DUP
YVD-12	YVD-D3-160309	03/09/2016	FD	59029941	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.50**	--	--	**72.0**	--	--	**180**	J	DUP
YVD-12	YVD-12-160622	6/22/2016	N	59037271	2.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.90**	--	--	**72.0**	--	--	**180**	--	--
YVD-12	YVD-12-160929	9/29/2016	N	K1611704	0.100	U	--	0.500	U	--	--	--	--	**0.026**	--	--	--	--	--	--	--	--	**2.28**	--	--	**67.7**	--	--	**158**	--	--
YVD-12	YVD-12-161213	12/13/2016	N	K1615083	0.100	U	--	0.500	U	--	--	--	--	**0.018**	--	--	--	--	--	--	--	--	**2.29**	--	--	**67.9**	--	--	**150**	--	--
YVD-12	YVD-030917-20	3/9/2017	N	K1702404	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.008**	J	--	--	--	--	--	--	--	**2.27**	--	--	**67.4**	--	--	**227**	--	--
YVD-12	YVD-060617-25	6/6/2017	N	K1705833	0.100	U	--	0.500	U	--	--	--	--	**0.010**	J	--	--	--	--	--	--	--	**2.24**	--	--	**66.5**	--	--	**155**	--	--
YVD-12	YVD-092517-15	9/25/2017	N	K1710333	0.100	U	--	0.500	U	--	--	--	--	0.010	U	--	--	--	--	--	--	--	**2.27**	--	--	**64.4**	--	--	**177**	--	--
YVD-12	YVD-120417-03	12/4/2017	N	K1713026	0.100	U	--	0.500	U	--	--	--	--	0.013	U	MBK	--	--	--	--	--	--	**2.06**	--	--	**70.8**	--	--	**169**	--	--
YVD-12	YVD-031918-13	3/19/2018	N	870610	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.30**	--	--	**70.5**	--	--	**167**	--	--
YVD-12	YVD-060318-11	6/3/2018	N	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.58**	--	--	**68.0**	--	--	**171**	--	--
YVD-12	YVD-090918-16	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.52**	--	--	**67.0**	--	--	**180**	--	--
YVD-12	YVD-121018-13	12/10/2018	N	884857	0.050	U	--	10.0	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.52**	--	--	**69.5**	--	--	**170**	--	--
YVD-12	YVD-031719-07	3/17/2019	N	988239	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.46**	--	--	**70.5**	--	--	**188**	--	--
YVD-12	YVD-060319-27	6/3/2019	N	992053	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.40**	--	--	**66.5**	--	--	**188**	--	--
YVD-12	YVD-090919-16	9/9/2019	N	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.48**	--	--	**60.5**	--	--	**172**	--	--
YVD-12	YVD-120919-12	12/9/2019	N	902276	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.48**	--	--	**67.0**	J	MSD	**176**	--	--
YVD-12	YVD-033020-11	3/30/2020	N	006241	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.44**	--	--	**63.0**	--	--	**170**	--	--
YVD-12	YVD-060920-22	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.50**	--	--	**71.5**	--	--	**179**	--	--
YVD-12	YVD-092120-18	9/21/2020	N	013896	0.050	U	--	2.50	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.38**	--	--	**60.5**	--	--	**168**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-12	YVD-120820-19	12/8/2020	N	017137	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.59**	--	--	**62.0**	--	--	**174**	--	--
YVD-12	YVD-030221-19	3/2/2021	N	120034	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.44**	--	--	**59.5**	--	--	**168**	--	--
YVD-12	YVD-060821-25	6/8/2021	N	124212	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.41**	--	--	**60.0**	--	--	**176**	--	--
YVD-12	YVD-121521-18	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-12	YVD-031522-21	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-12	YVD-060622-20	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-12	YVD-091322-09	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-12	YVD-120822-16	12/8/2022	N	K2214578	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-12	YVD-030523-02	3/5/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-12	YVD-062123-31	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-13	YVD-13-130919	09/19/2013	N	SWI0138	2.00	U	--	--	R	FBK	--	--	--	--	--	--	--	R	FBK	--	--	--	**4.30**	--	--	**114**	--	--	**365**	--	--
YVD-13	YVD-13-131211	12/11/2013	N	SWL0073	2.00	U	--	0.200	UJ	MSD	--	--	--	--	--	--	--	--	--	**0.110**	--	--	**4.16**	--	--	**110**	--	--	**278**	--	--
YVD-13	YVD-13-140318	03/18/2014	N	SXC0095	2.00	U	--	**0.613**	--	--	**0.170**	--	--	--	--	--	--	--	--	--	--	--	**4.27**	--	--	**106**	--	--	**312**	J--	MSD
YVD-13	YVD-13-140603	06/03/2014	N	SXF0017	0.800	U	--	**0.727**	--	--	**0.078**	J+	FBK	--	--	--	--	--	--	--	--	--	**3.70**	--	--	**113**	--	--	**151**	J--	MSD
YVD-13	YVD-13-140923	09/23/2014	N	SXI0173	2.00	U	--	**9.13**	J+	MSD	0.050	U	--	--	--	--	--	--	--	--	--	--	**4.40**	--	--	**118**	--	--	**328**	--	--
YVD-13	YVD-13-141217	12/17/2014	N	SXL0121	2.00	U	--	0.250	UJ	MSD	0.100	U	--	--	--	--	--	--	--	--	--	--	**4.74**	--	--	**119**	--	--	**355**	--	--
YVD-13	YVD-13-150317	03/17/2015	N	5904541	2.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.00**	--	--	**120**	--	--	**290**	J--	MSD
YVD-13	YVD-13-150617	06/17/2015	N	59010961	2.00	U	--	**0.680**	J--	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.40**	J+	MSD	**120**	J+	MSD	**310**	--	--
YVD-13	YVD-13-150924	09/24/2015	N	59020391	2.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.10**	--	--	**110**	--	--	**330**	J--	MSD
YVD-13	YVD-13-151216	12/16/2015	N	59025501	2.00	U	--	--	R	MSD	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**4.30**	--	--	**120**	--	--	**310**	--	--
YVD-13	YVD-13-160309	03/09/2016	N	59029941	2.00	U	--	0.250	UJ	FDP, MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.20**	--	--	**120**	--	--	**390**	J	DUP
YVD-13	YVD-13-160622	6/22/2016	N	59037271	2.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.20**	--	--	**120**	--	--	**390**	--	--
YVD-13	YVD-13-160928	9/28/2016	N	K1611698	0.100	U	--	--	R	MSD	--	--	--	**0.014**	--	--	--	--	--	--	--	--	**3.91**	--	--	**113**	--	--	**321**	--	--
YVD-13	YVD-13-161214	12/13/2016	N	K1615083	0.100	U	--	0.500	U	--	--	--	--	**0.047**	--	--	--	--	--	--	--	--	**4.02**	--	--	**111**	--	--	**313**	--	--
YVD-13	YVD-030717-08	3/7/2017	N	K1702324	**0.050**	J	HTQ	0.500	U	--	--	--	--	**0.010**	J	--	--	--	--	--	--	--	**3.63**	--	--	**105**	--	--	**277**	--	--
YVD-13	YVD-030717-10	3/7/2017	FD	K1702324	**0.040**	J	HTQ	0.500	U	--	--	--	--	**0.009**	J	--	--	--	--	--	--	--	**3.71**	--	--	**107**	--	--	**280**	--	--
YVD-13	YVD-060717-33	6/7/2017	N	K1705833	0.100	U	--	0.500	U	--	--	--	--	**0.014**	--	--	--	--	--	--	--	--	**3.83**	--	--	**114**	--	--	**282**	--	--
YVD-13	YVD-092617-25	9/26/2017	N	K1710333	0.100	U	--	0.500	U	--	--	--	--	0.010	U	--	--	--	--	--	--	--	**3.66**	--	--	**105**	--	--	**298**	--	--
YVD-13	YVD-120417-07	12/4/2017	N	K1713026	0.100	U	--	0.500	U	--	--	--	--	0.015	U	MBK	--	--	--	--	--	--	**3.41**	--	--	**102**	--	--	**271**	--	--
YVD-13	YVD-031918-19	3/19/2018	N	870634	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.82**	--	--	**102**	--	--	**249**	--	--
YVD-13	YVD-060318-09	6/3/2018	N	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.01**	--	--	**108**	--	--	**235**	--	--
YVD-13	YVD-090918-14	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.90**	--	--	**104**	--	--	**222**	--	--
YVD-13	YVD-121018-11	12/10/2018	N	884857	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.95**	--	--	**104**	--	--	**225**	--	--
YVD-13	YVD-031819-15	3/18/2019	N	988273	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.04**	--	--	**105**	--	--	**223**	--	--
YVD-13	YVD-060319-25	6/3/2019	N	992053	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.87**	--	--	**103**	--	--	**201**	--	--
YVD-13	YVD-090919-10	9/9/2019	N	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.95**	--	--	**95.0**	--	--	**197**	--	--
YVD-13	YVD-120919-10	12/9/2019	N	902276	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.90**	--	--	**102**	J	MSD	**191**	--	--
YVD-13	YVD-033020-09	3/30/2020	N	006241	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.92**	--	--	**100**	--	--	**200**	--	--
YVD-13	YVD-060920-21	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.97**	--	--	**106**	--	--	**176**	--	--
YVD-13	YVD-092120-13	9/21/2020	N	013896	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.04**	--	--	**103**	--	--	**198**	--	--
YVD-13	YVD-120820-17	12/8/2020	N	017137	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.16**	--	--	**102**	--	--	**166**	--	--
YVD-13	YVD-030221-15	3/2/2021	N	120034	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.96**	--	--	**101**	--	--	**195**	--	--
YVD-13	YVD-060821-32	6/8/2021	N	124212	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.96**	--	--	**100**	--	--	**196**	--	--
YVD-13	YVD-121521-16	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-13	YVD-031522-20	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-13	YVD-060722-24	6/7/2022	N	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-13	YVD-091322-11	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-13	YVD-122722-18	12/27/2022	N	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-13	YVD-030623-08	3/6/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-13	YVD-030623-09	3/6/2023	FD	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-13	YVD-062023-14	6/20/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-14	YVD-14-130918	09/18/2013	N	SWI0123	2.00	U	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	**3.45**	--	--	**110**	--	--	**213**	--	--
YVD-14	YVD-14-131212	12/12/2013	N	SWL0078	2.00	U	--	0.796	U	ERL	--	--	--	--	--	--	--	--	--	0.060	U	--	**3.29**	--	--	**108**	--	--	**186**	--	--
YVD-14	YVD-14-140319	03/19/2014	N	SXC0107	2.00	U	--	**0.562**	J--	MSD	0.050	U	--	--	--	--	--	--	--	--	--	--	**3.37**	--	--	**102**	--	--	**190**	--	--
YVD-14	YVD-14-140604	06/04/2014	N	SXF0025	2.00	U	--	0.250	UJ	MSD	**0.078**	--	--	--	--	--	--	--	--	--	--	--	**3.46**	--	--	**112**	--	--	**191**	--	--
YVD-14	YVD-14-140924	09/24/2014	N	SXI0173	2.00	U	--	0.250	U	--	**0.087**	J+	FBK	--	--	--	--	--	--	--	--	--	**4.10**	--	--	**124**	--	--	**178**	--	--
YVD-14	YVD-14-141217	12/17/2014	N	SXL0121	2.00	U	--	0.250	UJ	MSD	0.100	U	--	--	--	--	--	--	--	--	--	--	**3.83**	--	--	**113**	--	--	**185**	--	--
YVD-14	YVD-14-150318	03/18/2015	N	5904651	2.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.60**	J--	MSD	**130**	--	--	**180**	--	--
YVD-14R	YVD-14R-151216	12/16/2015	N	59025501	2.00	U	--	--	R	MSD	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**4.40**	--	--	**120**	--	--	**160**	--	--
YVD-14R	YVD-14R-160309	03/09/2016	N	59029941	2.00	U	--	0.250	UJ	FDP, MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.40**	--	--	**130**	--	--	**180**	J	DUP
YVD-14R	YVD-14R-160622	6/22/2016	N	59037271	2.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.30**	--	--	**130**	--	--	**150**	--	--
YVD-14R	YVD-14R-160928	9/28/2016	N	K1611698	0.100	U	--	--	R	MSD	--	--	--	**0.015**	--	--	--	--	--	--	--	--	**4.05**	--	--	**126**	--	--	**140**	--	--
YVD-14R	YVD-14R-161212	12/12/2016	N	K1615029	0.100	UJ	HTQ	0.500	U	--	--	--	--	**0.058**	--	--	--	--	--	--	--	--	**4.09**	--	--	**119**	--	--	**158**	--	--
YVD-14R	YVD-D1-161212	12/12/2016	FD	K1615029	0.100	UJ	HTQ	0.500	U	--	--	--	--	**0.092**	--	--	--	--	--	--	--	--	**4.17**	--	--	**121**	--	--	**155**	--	--
YVD-14R	YVD-030917-19	3/9/2017	N	K1702404	0.100	U	--	0.500	U	--	--	--	--	**0.020**	--	--	--	--	--	--	--	--	**3.80**	--	--	**117**	--	--	**147**	--	--
YVD-14R	YVD-030917-21	3/9/2017	FD	K1702404	0.100	U	--	0.500	U	--	--	--	--	**0.019**	--	--	--	--	--	--	--	--	**3.75**	--	--	**115**	--	--	**151**	--	--
YVD-14R	YVD-060517-06	6/5/2017	N	K1705702	0.100	U	--	0.500	U	--	--	--	--	**0.038**	--	--	--	--	--	--	--	--	**3.53**	--	--	**110**	--	--	**142**	--	--
YVD-14R	YVD-092517-14	9/25/2017	N	K1710333	0.100	U	--	0.500	U	--	--	--	--	**0.018**	--	--	--	--	--	--	--	--	**3.85**	--	--	**121**	--	--	**138**	--	--
YVD-14R	YVD-120417-12	12/4/2017	N	K1713026	0.100	U	--	0.500	U	--	--	--	--	**0.024**	--	--	--	--	--	--	--	--	**3.54**	--	--	**116**	--	--	**124**	--	--
YVD-14R	YVD-031818-11	3/18/2018	N	870610	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.96**	--	--	**127**	--	--	**128**	--	--
YVD-14R	YVD-060318-04	6/3/2018	N	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.18**	--	--	**130**	--	--	**123**	--	--
YVD-14R	YVD-090918-09	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.09**	--	--	**130**	--	--	**125**	--	--
YVD-14R	YVD-121018-02	12/10/2018	N	884857	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.39**	--	--	**131**	--	--	**139**	--	--
YVD-14R	YVD-121018-04	12/10/2018	FD	884857	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.36**	--	--	**131**	--	--	**136**	--	--
YVD-14R	YVD-031819-12	3/18/2019	N	988273	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.56**	--	--	**136**	--	--	**147**	--	--
YVD-14R	YVD-031819-14	3/18/2019	FD	988273	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.57**	--	--	**136**	--	--	**145**	--	--
YVD-14R	YVD-060319-22	6/3/2019	N	992053	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.42**	--	--	**136**	--	--	**145**	--	--
YVD-14R	YVD-060319-24	6/3/2019	FD	992053	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.38**	--	--	**132**	--	--	**131**	--	--
YVD-14R	YVD-090919-13	9/9/2019	N	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.48**	--	--	**129**	--	--	**133**	--	--
YVD-14R	YVD-121019-15	12/10/2019	N	902321	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.71**	--	--	**128**	--	--	**123**	--	--
YVD-14R	YVD-121019-17	12/10/2019	FD	902321	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.75**	--	--	**128**	--	--	**124**	--	--
YVD-14R	YVD-033020-02	3/30/2020	N	006241	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.20**	--	--	**134**	--	--	**125**	--	--
YVD-14R	YVD-033020-04	3/30/2020	FD	006241	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.34**	--	--	**134**	--	--	**123**	--	--
YVD-14R	YVD-060920-20	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.44**	--	--	**152**	--	--	**132**	--	--
YVD-14R	YVD-092120-14	9/21/2020	N	013896	0.050	U	--	2.50	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.31**	--	--	**144**	--	--	**124**	--	--
YVD-14R	YVD-120820-20	12/8/2020	N	017137	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.60**	--	--	**144**	--	--	**129**	--	--
YVD-14R	YVD-030121-08	3/1/2021	N	119931	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.59**	--	--	**147**	--	--	**122**	--	--
YVD-14R	YVD-060621-09	6/6/2021	N	124053	0.050	U	--	5.00	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.71**	--	--	**146**	--	--	**114**	--	--
YVD-14R	YVD-121421-08	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-14R	YVD-031422-07	3/14/2022	N	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-14R	YVD-060522-09	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-14R	YVD-091422-15	9/14/2022	N	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-14R	YVD-120822-13	12/8/2022	N	K2214578	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-14R	YVD-120822-14	12/8/2022	FD	K2214578	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-14R	YVD-030523-03	3/5/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-14R	YVD-062123-29	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 8
Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-15	YVD-15-130917	09/17/2013	N	SWI0123	2.00	U	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	**2.73**	--	--	**127**	--	--	**51.5**	--	--
YVD-15	YVD-15-131212	12/12/2013	N	SWL0078	2.00	U	--	0.200	U	--	--	--	--	--	--	--	--	--	--	**0.238**	--	--	**4.48**	--	--	**114**	--	--	**114**	--	--
YVD-15	YVD-15-140319	03/19/2014	N	SXC0107	2.00	U	--	**0.553**	J--	MSD	**0.220**	--	--	--	--	--	--	--	--	--	--	--	**5.23**	--	--	**93.5**	--	--	**44.7**	--	--
YVD-15	YVD-15-140603	06/03/2014	N	SXF0025	2.00	U	--	**0.475**	J--	MSD	**0.310**	--	--	--	--	--	--	--	--	--	--	--	**5.20**	--	--	**110**	--	--	**39.0**	--	--
YVD-15	YVD-15-140924	09/24/2014	N	SXI0173	2.00	U	--	**1.19**	J+	MSD	**0.072**	J+	FBK	--	--	--	--	--	--	--	--	--	**3.11**	--	--	**135**	--	--	**50.7**	--	--
YVD-15	YVD-15-141217	12/17/2014	N	SXL0121	2.00	U	--	**0.414**	J--	MSD	**0.170**	--	--	--	--	--	--	--	--	--	--	--	**3.67**	--	--	**60.3**	--	--	**53.4**	--	--
YVD-15	YVD-15-150317	03/17/2015	N	5904651	2.00	U	--	0.250	UJ	MSD	**0.270**	--	--	--	--	--	--	--	--	--	--	--	**8.40**	J--	MSD	**160**	--	--	**53.0**	--	--
YVD-15	YVD-15-150617	06/17/2015	N	59011021	0.200	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.60**	J	RPD	**110**	J	RPD	**59.0**	--	--
YVD-15	YVD-15-150925	09/25/2015	N	59020431	2.00	U	--	2.50	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.90**	--	--	**80.0**	--	--	**47.0**	--	--
YVD-15	YVD-15-151215	12/15/2015	N	59025431	2.00	U	--	--	R	MSD	0.250	UJ	FDP	--	--	--	--	--	--	--	--	--	**4.10**	--	--	**80.0**	--	--	**40.0**	--	--
YVD-15	YVD-15-160309	03/09/2016	N	59029711	2.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.20**	--	--	**75.0**	--	--	**65.0**	J+	MSD
YVD-15	YVD-15-160621	6/21/2016	N	59037271	2.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.50**	--	--	**74.0**	--	--	**86.0**	--	--
YVD-15	YVD-15-160928	9/28/2016	N	K1611629	0.100	U	--	0.500	U	--	--	--	--	**0.023**	--	--	--	--	--	--	--	--	**3.15**	--	--	**66.2**	--	--	**108**	--	--
YVD-15	YVD-15-161215	12/15/2016	N	K1615126	0.100	U	--	0.500	U	--	--	--	--	**0.095**	--	--	--	--	--	--	--	--	**3.40**	--	--	**59.1**	--	--	**108**	--	--
YVD-15	YVD-030917-23	3/9/2017	N	K1702404	0.100	U	--	0.500	U	--	--	--	--	**0.011**	--	--	--	--	--	--	--	--	**2.95**	--	--	**55.3**	--	--	**125**	--	--
YVD-15	YVD-060617-20	6/6/2017	N	K1705754	0.100	U	--	0.500	U	--	--	--	--	**0.017**	--	--	--	--	--	--	--	--	**2.98**	--	--	**62.9**	--	--	**143**	--	--
YVD-15	YVD-092517-10	9/25/2017	N	K1710333	0.100	U	--	0.500	U	--	--	--	--	0.010	U	--	--	--	--	--	--	--	**3.21**	--	--	**74.5**	--	--	**167**	--	--
YVD-15	YVD-120517-28	12/5/2017	N	K1713091	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.013**	--	--	--	--	--	--	--	--	**2.89**	--	--	**78.6**	--	--	**145**	--	--
YVD-15	YVD-031818-09	3/18/2018	N	870610	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.25**	--	--	**94.5**	--	--	**129**	--	--
YVD-15	YVD-060318-08	6/3/2018	N	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.36**	--	--	**97.5**	--	--	**118**	--	--
YVD-15	YVD-090918-11	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.18**	--	--	**99.0**	--	--	**110**	--	--
YVD-15	YVD-121018-06	12/10/2018	N	884857	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.25**	--	--	**97.5**	--	--	**111**	--	--
YVD-15	YVD-031719-10	3/17/2019	N	988239	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.22**	--	--	**96.0**	--	--	**110**	--	--
YVD-15	YVD-060419-29	6/4/2019	N	992242	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.18**	--	--	**100**	--	--	**114**	--	--
YVD-15	YVD-090919-11	9/9/2019	N	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.14**	--	--	**92.0**	--	--	**103**	--	--
YVD-15	YVD-121019-19	12/10/2019	N	902321	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.40**	--	--	**91.5**	--	--	**96.9**	--	--
YVD-15	YVD-033020-06	3/30/2020	N	006241	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.12**	--	--	**90.0**	--	--	**90.9**	--	--
YVD-15	YVD-060920-16	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.08**	--	--	**96.0**	--	--	**87.7**	--	--
YVD-15	YVD-092020-09	9/20/2020	N	013864	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.12**	--	--	**89.5**	--	--	**90.0**	--	--
YVD-15	YVD-120720-14	12/7/2020	N	017035	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.35**	--	--	**89.0**	--	--	**89.0**	--	--
YVD-15	YVD-030121-14	3/1/2021	N	119931	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.15**	--	--	**85.5**	--	--	**86.9**	--	--
YVD-15	YVD-060621-08	6/6/2021	N	124053	0.050	U	--	5.00	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.32**	--	--	**86.5**	--	--	**72.0**	--	--
YVD-15	YVD-121421-07	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-15	YVD-031422-05	3/14/2022	N	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-15	YVD-060522-07	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-15	YVD-091422-19	9/14/2022	N	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-15	YVD-120622-07	12/6/2022	N	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-15	YVD-030523-04	3/5/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-15	YVD-062123-25	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-16	YVD-16-130923	09/23/2013	N	SWI0178	--	--	--	**0.375**	--	--	--	--	--	--	--	--	0.100	U	--	--	--	--	**6.16**	--	--	**81.7**	--	--	--	--	--
YVD-16	YVD-16-130926	09/26/2013	N	SWI0190	2.00	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**140**	--	--
YVD-16	YVD-16-131212	12/12/2013	N	SWL0073	2.00	U	--	0.200	UJ	MSD	--	--	--	--	--	--	--	--	--	0.060	U	--	**5.25**	--	--	**79.8**	--	--	**163**	--	--
YVD-16	YVD-16-140318	03/18/2014	N	SXC0107	2.00	U	--	**1.01**	J--	MSD	**1.40**	--	--	--	--	--	--	--	--	--	--	--	**15.0**	--	--	**75.5**	--	--	**130**	--	--
YVD-16	YVD-16-140603	06/03/2014	N	SXF0017	0.800	U	--	**0.741**	--	--	**0.830**	--	--	--	--	--	--	--	--	--	--	--	**8.47**	--	--	**78.4**	--	--	**131**	J--	MSD
YVD-16	YVD-16-140923	09/23/2014	N	SXI0173	1.00	U	--	**0.747**	J+	MSD	**0.220**	--	--	--	--	--	--	--	--	--	--	--	**7.48**	--	--	**94.1**	--	--	**114**	--	--
YVD-16	YVD-16-141217	12/17/2014	N	SXL0121	1.00	U	--	0.250	UJ	MSD	**0.250**	J	FDP	--	--	--	--	--	--	--	--	--	**6.77**	--	--	**83.7**	--	--	**118**	--	--
YVD-16	YVD-D3-141217	12/17/2014	FD	SXL0121	0.200	U	--	**0.290**	J--	MSD	**0.100**	J	FDP	--	--	--	--	--	--	--	--	--	**6.27**	--	--	**81.7**	--	--	**130**	--	--
YVD-16	YVD-16-150317	03/17/2015	N	5904651	1.00	U	--	**0.290**	J--	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**6.10**	J--	MSD	**87.0**	--	--	**120**	--	--

Table 8
Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-16	YVD-16-150616	06/16/2015	N	59010961	1.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**6.20**	J+	MSD	**91.0**	J+	MSD	**120**	--	--
YVD-16	YVD-16-150923	09/23/2015	N	59020281	1.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**6.50**	--	--	**85.0**	--	--	**130**	--	--
YVD-16	YVD-16-151215	12/15/2015	N	59025431	1.00	U	--	--	R	MSD	0.250	UJ	FDP	--	--	--	--	--	--	--	--	--	**5.70**	--	--	**85.0**	--	--	**120**	--	--
YVD-16	YVD-16-160309	03/09/2016	N	59029711	1.00	U	--	--	R	MSD	**0.270**	--	--	--	--	--	--	--	--	--	--	--	**7.40**	--	--	**86.0**	--	--	**130**	J+	MSD
YVD-16	YVD-16-160621	6/21/2016	N	59037151	1.00	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**5.90**	--	--	**86.0**	--	--	**120**	--	--
YVD-16	YVD-D2-160621	6/21/2016	FD	59037151	0.200	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**6.00**	--	--	**88.0**	--	--	**120**	--	--
YVD-16	YVD-16-160928	9/28/2016	N	K1611629	0.100	U	--	0.500	U	--	--	--	--	**0.016**	--	--	--	--	--	--	--	--	**5.69**	--	--	**90.2**	--	--	**110**	--	--
YVD-16	YVD-16-161215	12/15/2016	N	K1615126	0.100	U	--	0.500	U	--	--	--	--	**0.068**	--	--	--	--	--	--	--	--	**5.59**	--	--	**82.5**	--	--	**112**	--	--
YVD-16	YVD-030917-22	3/9/2017	N	K1702404	0.100	U	--	0.500	U	--	--	--	--	**0.045**	--	--	--	--	--	--	--	--	**5.16**	--	--	**79.8**	--	--	**113**	--	--
YVD-16	YVD-060517-12	6/5/2017	N	K1705754	0.100	U	--	0.500	U	--	--	--	--	**0.021**	--	--	--	--	--	--	--	--	**5.08**	--	--	**83.0**	--	--	**117**	--	--
YVD-16	YVD-092617-28	9/26/2017	N	K1710381	0.100	U	--	0.500	U	--	--	--	--	**0.016**	--	--	--	--	--	--	--	--	**5.44**	--	--	**84.1**	--	--	**115**	--	--
YVD-16	YVD-120517-22	12/5/2017	N	K1713091	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.048**	--	--	--	--	--	--	--	--	**5.17**	--	--	**80.1**	--	--	**110**	--	--
YVD-16	YVD-031918-16	3/19/2018	N	870634	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.25**	--	--	**79.0**	--	--	**106**	--	--
YVD-16	YVD-060318-10	6/3/2018	N	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.55**	--	--	**88.0**	--	--	**104**	--	--
YVD-16	YVD-090918-07	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.20**	--	--	**83.5**	--	--	**107**	--	--
YVD-16	YVD-121118-20	12/11/2018	N	884939	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.85**	--	--	**84.0**	--	--	**106**	--	--
YVD-16	YVD-031719-08	3/17/2019	N	988239	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.45**	--	--	**82.0**	--	--	**109**	--	--
YVD-16	YVD-060219-06	6/2/2019	N	991939	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.45**	--	--	**80.5**	--	--	**106**	--	--
YVD-16	YVD-090919-07	9/9/2019	N	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.30**	--	--	**77.0**	--	--	**107**	--	--
YVD-16	YVD-120919-11	12/9/2019	N	902276	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.35**	--	--	**79.5**	J	MSD	**106**	--	--
YVD-16	YVD-033120-16	3/31/2020	N	006260	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.35**	--	--	**82.0**	--	--	**107**	--	--
YVD-16	YVD-061020-30	6/10/2020	N	009361	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.20**	--	--	**79.0**	--	--	**106**	--	--
YVD-16	YVD-092020-06	9/20/2020	N	013864	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.45**	--	--	**81.0**	--	--	**112**	--	--
YVD-16	YVD-120720-08	12/7/2020	N	017035	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.95**	--	--	**84.0**	--	--	**112**	--	--
YVD-16	YVD-030121-02	3/1/2021	N	119931	0.050	U	--	2.50	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.25**	--	--	**78.0**	--	--	**113**	--	--
YVD-16	YVD-030121-04	3/1/2021	FD	119931	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.50**	--	--	**79.5**	--	--	**115**	--	--
YVD-16	YVD-060621-03	6/6/2021	N	124053	0.050	U	--	5.00	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.03**	--	--	**77.5**	--	--	**111**	--	--
YVD-16	YVD-121421-02	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-16	YVD-121421-03	12/14/2021	FD	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-16	YVD-031522-17	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-16	YVD-060622-16	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-16	YVD-091322-08	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-16	YVD-120622-05	12/6/2022	N	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-16	YVD-030523-05	3/5/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-16	YVD-030523-06	3/5/2023	FD	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-16	YVD-062023-13	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-17	YVD-17-130919	09/19/2013	N	SWI0142	--	--	--	2.50	U	--	--	--	--	--	--	--	**3.64**	--	--	--	--	--	**8.32**	--	--	**12.2**	--	--	**6.48**	--	--
YVD-17	YVD-17-130924	09/24/2013	N	SWI0175	0.200	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-17	YVD-17-131210	12/10/2013	N	SWL0055	0.200	U	--	--	R	FBK, MSD	--	--	--	--	--	--	--	--	--	**1.61**	--	--	**5.25**	--	--	**7.89**	--	--	**6.64**	--	--
YVD-17	YVD-17-140316	03/16/2014	N	SXC0081	0.200	U	--	0.250	U	--	**0.300**	--	--	--	--	--	--	--	--	--	--	--	**1.73**	--	--	**6.09**	--	--	**6.42**	--	--
YVD-17	YVD-17-140601	06/01/2014	N	SXF0008	0.200	U	--	**0.287**	--	--	**0.520**	--	--	--	--	--	--	--	--	--	--	--	**2.22**	--	--	**8.71**	--	--	**5.74**	--	--
YVD-17	YVD-17-140922	09/22/2014	N	SXI0148	0.200	U	--	**0.293**	--	--	**0.360**	--	--	--	--	--	--	--	--	--	--	--	**2.91**	--	--	**9.92**	--	--	**5.08**	--	--
YVD-17	YVD-17-141215	12/15/2014	N	SXL0103	0.200	U	--	0.250	U	--	**0.190**	--	--	--	--	--	--	--	--	--	--	--	**1.84**	--	--	**9.15**	--	--	**6.01**	J+	MSD, DUP
YVD-17	YVD-17-150316	03/16/2015	N	5904471	0.200	U	--	0.250	UJ	MSD	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**1.40**	--	--	**6.30**	--	--	**5.70**	--	--
YVD-17	YVD-D1-150316	03/16/2015	FD	5904471	0.200	U	--	0.250	UJ	MSD	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**1.50**	--	--	**6.20**	--	--	**5.70**	--	--
YVD-17	YVD-17-150617	06/17/2015	N	59010961	0.200	U	--	0.250	UJ	MSD	**0.250**	--	--	--	--	--	--	--	--	--	--	--	**1.80**	J+	MSD	**8.70**	J+	MSD	**5.40**	--	--
YVD-17	YVD-17-150924	09/24/2015	N	59020391	**1.20**	--	--	0.250	UJ	MSD	**0.260**	--	--	--	--	--	--	--	--	--	--	--	**2.00**	--	--	**9.00**	--	--	**5.60**	J--	MSD
YVD-17	YVD-17-151216	12/16/2015	N	59025501	0.200	U	--	--	R	MSD	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**1.40**	--	--	**8.00**	--	--	**5.40**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-17	YVD-17-160310	03/10/2016	N	59029941	0.200	U	--	0.250	UJ	FDP	0.250	U	--	--	--	--	--	--	--	--	--	--	**1.20**	--	--	**6.40**	--	--	**4.80**	J	DUP
YVD-17	YVD-17-160623	6/23/2016	N	59037371	0.200	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**1.60**	--	--	**8.30**	--	--	**5.30**	--	--
YVD-17	YVD-17-160926	9/26/2016	N	K1611565	0.100	U	--	--	R	MSD	--	--	--	**0.095**	--	--	--	--	--	--	--	--	**1.59**	--	--	**8.30**	--	--	**7.90**	--	--
YVD-17	YVD-17-161215	12/15/2016	N	K1615174	0.100	U	--	0.500	U	--	--	--	--	**0.103**	--	--	--	--	--	--	--	--	**1.46**	--	--	**7.44**	--	--	**6.00**	--	--
YVD-17	YVD-031017-29	3/10/2017	N	K1702448	0.100	U	--	0.500	U	--	--	--	--	**0.038**	--	--	--	--	--	--	--	--	**0.260**	--	--	**5.39**	--	--	**6.26**	--	--
YVD-17	YVD-060617-24	6/6/2017	N	K1705754	0.100	U	--	0.500	U	--	--	--	--	**0.055**	--	--	--	--	--	--	--	--	**1.16**	--	--	**7.81**	--	--	**6.02**	--	--
YVD-17	YVD-092517-08	9/25/2017	N	K1710274	0.100	U	--	0.500	U	--	--	--	--	**0.046**	--	--	--	--	--	--	--	--	**1.73**	--	--	**9.50**	--	--	**7.17**	--	--
YVD-17	YVD-120517-26	12/5/2017	N	K1713091	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.036**	--	--	--	--	--	--	--	--	**1.55**	--	--	**9.87**	--	--	**7.53**	--	--
YVD-17	YVD-060418-20	6/4/2018	N	874662	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**0.780**	--	--	**7.20**	--	--	**6.54**	--	--
YVD-17	YVD-060219-12	6/2/2019	N	991939	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	**5.95**	--	--	**3.50**	--	--
YVD-17	YVD-060820-10	6/8/2020	N	009144	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	**6.20**	--	--	**6.06**	--	--
YVD-17	YVD-060621-04	6/6/2021	N	124053	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	**5.75**	--	--	**5.44**	--	--
YVD-17	YVD-060621-05	6/6/2021	FD	124053	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	**5.75**	--	--	**5.31**	--	--
YVD-17	YVD-060622-14	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-17	YVD-062023-15	6/20/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-18	YVD-18-130919	09/19/2013	N	SWI0142	--	--	--	--	R	FBK	--	--	--	--	--	--	0.100	U	--	--	--	--	**3.22**	--	--	**78.3**	--	--	**122**	--	--
YVD-18	YVD-18-130925	09/25/2013	N	SWI0175	2.00	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-18	YVD-18-131211	12/11/2013	N	SWL0073	2.00	U	--	1.50	UJ	MSD	--	--	--	--	--	--	--	--	--	0.060	U	--	**3.02**	--	--	**71.3**	--	--	**116**	--	--
YVD-18	YVD-D2-131211	12/11/2013	FD	SWL0073	2.00	U	--	0.200	UJ	MSD	--	--	--	--	--	--	--	--	--	0.060	U	--	**3.06**	--	--	**70.9**	--	--	**129**	--	--
YVD-18	YVD-18-140318	03/18/2014	N	SXC0095	2.00	U	--	**0.358**	--	--	**0.068**	--	--	--	--	--	--	--	--	--	--	--	**3.30**	--	--	**77.5**	--	--	**147**	J--	MSD
YVD-18	YVD-D2-140318	03/18/2014	FD	SXC0095	2.00	U	--	**0.342**	--	--	**0.082**	--	--	--	--	--	--	--	--	--	--	--	**3.26**	--	--	**78.0**	--	--	**140**	J--	MSD
YVD-18	YVD-18-140603	06/03/2014	N	SXF0017	0.800	U	--	**0.796**	--	--	**0.071**	J+	FBK	--	--	--	--	--	--	--	--	--	**3.24**	--	--	**77.7**	--	--	**135**	J--	MSD
YVD-18	YVD-18-140923	09/23/2014	N	SXI0173	1.00	U	--	**0.335**	J+	MSD	**0.086**	--	--	--	--	--	--	--	--	--	--	--	**3.80**	--	--	**81.6**	--	--	**111**	--	--
YVD-18	YVD-18-141216	12/16/2014	N	SXL0121	1.00	U	--	0.250	UJ	MSD	0.100	U	--	--	--	--	--	--	--	--	--	--	**3.63**	--	--	**81.8**	--	--	**131**	--	--
YVD-18	YVD-18-150317	03/17/2015	N	5904541	1.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.50**	--	--	**87.0**	--	--	**140**	J--	MSD
YVD-18	YVD-18-150617	06/17/2015	N	59010961	1.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.10**	J+	MSD	**86.0**	J+	MSD	**120**	--	--
YVD-18	YVD-18-150924	09/24/2015	N	59020391	1.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.50**	--	--	**77.0**	--	--	**140**	J--	MSD
YVD-18	YVD-18-151216	12/16/2015	N	59025501	1.00	U	--	--	R	MSD	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**4.00**	--	--	**91.0**	--	--	**150**	--	--
YVD-18	YVD-18-160309	03/09/2016	N	59029941	1.00	U	--	0.250	UJ	FDP, MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.80**	--	--	**89.0**	--	--	**150**	J	DUP
YVD-18	YVD-18-160622	6/22/2016	N	59037271	1.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.70**	--	--	**86.0**	--	--	**140**	--	--
YVD-18	YVD-18-160928	9/28/2016	N	K1611629	0.100	U	--	0.500	U	--	--	--	--	**0.013**	--	--	--	--	--	--	--	--	**3.75**	--	--	**83.8**	--	--	**135**	--	--
YVD-18	YVD-18-161214	12/14/2016	N	K1615083	0.100	U	--	0.500	U	--	--	--	--	**0.043**	--	--	--	--	--	--	--	--	**3.69**	--	--	**82.5**	--	--	**139**	--	--
YVD-18	YVD-D3-161214	12/14/2016	FD	K1615083	0.100	U	--	0.500	U	--	--	--	--	**0.019**	--	--	--	--	--	--	--	--	**3.82**	--	--	**84.0**	--	--	**142**	--	--
YVD-18	YVD-030617-05	3/6/2017	N	K1702324	**0.040**	J	HTQ	0.500	U	--	--	--	--	**0.024**	--	--	--	--	--	--	--	--	**3.39**	--	--	**78.8**	--	--	**140**	--	--
YVD-18	YVD-060717-31	6/7/2017	N	K1705833	0.100	U	--	0.500	U	--	--	--	--	**0.018**	--	--	--	--	--	--	--	--	**3.82**	--	--	**81.8**	--	--	**135**	--	--
YVD-18	YVD-092617-27	9/26/2017	N	K1710333	0.100	U	--	0.500	U	--	--	--	--	**0.018**	--	--	--	--	--	--	--	--	**3.64**	--	--	**77.0**	--	--	**137**	--	--
YVD-18	YVD-120417-05	12/4/2017	N	K1713026	0.100	U	--	0.500	U	--	--	--	--	0.017	U	MBK	--	--	--	--	--	--	**3.62**	--	--	**81.6**	--	--	**144**	--	--
YVD-18	YVD-031918-17	3/19/2018	N	870634	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.78**	--	--	**83.0**	--	--	**161**	--	--
YVD-18	YVD-060318-07	6/3/2018	N	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.18**	--	--	**88.5**	--	--	**147**	--	--
YVD-18	YVD-090918-12	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.20**	--	--	**78.0**	--	--	**127**	--	--
YVD-18	YVD-121018-09	12/10/2018	N	884857	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.10**	--	--	**87.0**	--	--	**145**	--	--
YVD-18	YVD-031819-13	3/18/2019	N	988273	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.22**	--	--	**88.0**	--	--	**171**	--	--
YVD-18	YVD-060319-23	6/3/2019	N	992053	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.09**	--	--	**86.0**	--	--	**161**	--	--
YVD-18	YVD-090919-06	9/9/2019	N	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.08**	--	--	**76.5**	--	--	**130**	--	--
YVD-18	YVD-090919-08	9/9/2019	FD	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.09**	--	--	**77.0**	--	--	**130**	--	--
YVD-18	YVD-120919-08	12/9/2019	N	902276	0.050	U		0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U		**4.18**			**86.0**	J	MSD	**157**		
YVD-18	YVD-033020-07	3/30/2020	N	006241	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.04**	--	--	**87.5**	--	--	**170**	--	--
YVD-18	YVD-060920-19	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.98**	--	--	**89.0**	--	--	**155**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-18	YVD-092120-15	9/21/2020	N	013896	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.03**	--	--	**83.0**	--	--	**145**	--	--
YVD-18	YVD-092120-17	9/21/2020	FD	013896	0.050	U	--	2.50	UJ	MSD	--	--	--	--	--	--	--	--	--	**0.070**	--	--	**4.00**	--	--	**83.0**	--	--	**144**	--	--
YVD-18	YVD-120820-15	12/8/2020	N	017137	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.11**	--	--	**88.0**	--	--	**164**	--	--
YVD-18	YVD-030221-17	3/2/2021	N	120034	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.02**	--	--	**87.0**	--	--	**169**	--	--
YVD-18	YVD-060821-30	6/8/2021	N	124212	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.02**	--	--	**85.5**	--	--	**161**	--	--
YVD-18	YVD-121521-12	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-18	YVD-121521-14	12/15/2021	FD	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-18	YVD-031522-18	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-18	YVD-060722-25	6/7/2022	N	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-18	YVD-060722-26	6/7/2022	FD	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-18	YVD-091322-13	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-18	YVD-122722-16	12/27/2022	N	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-18	YVD-122722-17	12/27/2022	FD	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-18	YVD-030623-11	3/6/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-18	YVD-062023-16	6/20/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Equipment Blank	YVD-EB-130918	09/18/2013	EB	SWI0123	0.200	U	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Equipment Blank	YVD-EB-130925	09/25/2013	EB	SWI0175	0.200	U	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Equipment Blank	YVD-EB-131212	12/12/2013	EB	SWL0078	0.200	U	--	0.200	U	--	--	--	--	--	--	--	--	--	--	0.060	U	--	1.00	U	--	0.500	U	--	0.500	U	--
Equipment Blank	YVD-EB-140317	03/17/2014	EB	SXC0081	0.200	U	--	0.250	U	--	--	--	--	0.05	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Equipment Blank	YVD-EB-140318	03/18/2014	EB	SXC0095	0.200	U	--	0.250	U	--	--	--	--	**0.05**	--	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Equipment Blank	YVD-EB-140319	03/19/2014	EB	SXC0107	0.200	U	--	0.250	U	--	--	--	--	0.05	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Equipment Blank	YVD-EB-140604	06/04/2014	EB	SXF0025	0.200	U	--	0.250	U	--	--	--	--	0.05	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	**1.24**	--	--
Equipment Blank	YVD-EB-140924	09/24/2014	EB	SXI0173	0.200	U	--	**1.20**	--	--	--	--	--	**0.062**	--	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Equipment Blank	YVD-EB-141217	12/17/2014	EB	SXL0144	0.200	U	--	0.250	U	--	--	--	--	0.1	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Equipment Blank	YVD-EB-150617	06/17/2015	EB	59011021	0.200	U	--	**0.370**	--	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Equipment Blank	YVD-EB-150925	09/25/2015	EB	59020431	0.200	U	--	**0.380**	--	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Equipment Blank	YVD-EB-151216	12/16/2015	EB	59025501	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Equipment Blank	YVD-EB-160310	03/10/2016	EB	59029941	0.200	U	--	**1.90**	--	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	**1.10**	--	--	0.500	U	--
Equipment Blank	YVD-EB-160623	6/23/2016	EB	59037371	0.200	U	--	**0.430**	--	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Equipment Blank	YVD-EB-160926	9/26/2016	EB	K1611506	0.100	U	--	--	R	MSD	--	--	--	0.01	U	--	--	--	--	--	--	--	**0.100**	J	--	**0.130**	J	--	0.200	U	--
Equipment Blank	YVD-EB-160927	9/27/2016	EB	K1611629	0.050	UJ	HTQ	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.200	U	--	**0.040**	J	--	**0.080**	J	--
Equipment Blank	YVD-EB-160928	9/28/2016	EB	K1611629	0.050	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.200	U	--	**0.040**	J	--	**0.510**	--	--
Equipment Blank	YVD-EB1-161214	12/14/2016	EB	K1615083	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	--	0.200	U	--
Equipment Blank	YVD-EB2-161215	12/15/2016	EB	K1615126	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	MBK	0.200	U	--
Equipment Blank	YVD-EB3-161216	12/16/2016	EB	K1615174	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	MBK	**0.400**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
Field Blank	YVD-F1-130916	09/16/2013	FB	SWI0113	0.200	U	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	1.00	U	--	0.500	U	--	**0.530**	--	--
Field Blank	YVD-F2-130917	09/17/2013	FB	SWI0113	0.200	U	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	1.00	U	--	0.500	U	--	**0.510**	--	--
Field Blank	YVD-F3-130918	09/18/2013	FB	SWI0123	0.200	U	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F4-130918	09/18/2013	FB	SWI0138	0.200	U	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F5-130919	09/19/2013	FB	SWI0142	--	--	--	**0.373**	--	--	--	--	--	--	--	--	**0.243**	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F6-130923	09/23/2013	FB	SWI0178	--	--	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	1.00	U	--	0.500	U	--	--	--	--
Field Blank	YVD-F7-130924	09/24/2013	FB	SWI0175	0.200	U	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F7-130926	09/26/2013	FB	SWI0190	0.200	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.500	U	--
Field Blank	YVD-F1-131209	12/09/2013	FB	SWL0055	0.200	U	--	**0.330**	--	--	--	--	--	--	--	--	--	--	--	0.06	U	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F2-131210	12/10/2013	FB	SWL0063	0.200	U	--	**3.70**	--	--	--	--	--	--	--	--	--	--	--	0.06	U	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F3-131211	12/11/2013	FB	SWL0073	0.200	U	--	**0.430**	--	--	--	--	--	--	--	--	--	--	--	0.06	U	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F4-131212	12/12/2013	FB	SWL0078	0.200	U	--	0.200	U	--	--	--	--	--	--	--	--	--	--	0.06	U	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F1-140316	03/16/2014	FB	SXC0081	0.200	U	--	0.250	U	--	--	--	--	0.05	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F2-140317	03/17/2014	FB	SXC0095	0.200	U	--	0.250	U	--	--	--	--	0.05	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F3-140318	03/18/2014	FB	SXC0107	0.200	U	--	0.250	U	--	--	--	--	0.05	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F4-140319	03/19/2014	FB	SXC0107	0.200	U	--	0.250	U	--	--	--	--	0.05	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F1-140601	06/01/2014	FB	SXF0008	0.200	U	--	0.250	U	--	--	--	--	0.05	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F2-140602	06/02/2014	FB	SXF0017	0.200	U	--	0.250	U	--	--	--	--	**0.061**	--	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F3-140603	06/03/2014	FB	SXF0025	0.200	U	--	0.250	U	--	--	--	--	0.05	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F1-140921	09/21/2014	FB	SXI0148	0.200	U	--	0.250	U	--	--	--	--	0.05	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F2-140922	09/22/2014	FB	SXI0148	0.200	U	--	0.250	U	--	--	--	--	0.05	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F3-140923	09/23/2014	FB	SXI0158	0.200	U	--	0.250	U	--	--	--	--	0.05	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F4-140924	09/24/2014	FB	SXI0173	0.200	U	--	0.250	U	--	--	--	--	**0.054**	--	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F1-141215	12/15/2014	FB	SXL0103	0.200	U	--	0.250	U	--	--	--	--	0.1	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	UJ	DUP
Field Blank	YVD-F2-141215	12/15/2014	FB	SXL0108	0.200	U	--	0.250	U	--	--	--	--	0.1	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F3-141216	12/16/2014	FB	SXL0121	0.200	U	--	0.250	U	--	--	--	--	0.1	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F4-141217	12/17/2014	FB	SXL0144	--	R	HTQ	0.250	U	--	--	--	--	0.1	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F1-150315	03/15/2015	FB	5904471	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F2-150316	03/16/2015	FB	5904541	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F3-150317	03/17/2015	FB	5904651	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F1-150615	06/15/2015	FB	59010751	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F2-150616	06/16/2015	FB	59010961	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F3-150617	06/17/2015	FB	59011021	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F1-150922	09/22/2015	FB	59020141	0.200	U	--	**0.260**	--	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F2-150923	09/23/2015	FB	59020281	0.200	U	--	0.250	U	--	--	--	--	**0.26**	--	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F3-150923	09/23/2015	FB	59020391	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F4-150924	09/24/2015	FB	59020391	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F5-150925	09/25/2015	FB	59020431	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F1-151213	12/13/2015	FB	59025351	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F2-151214	12/14/2015	FB	59025431	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F3-151215	12/15/2015	FB	59025501	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F4-151216	12/16/2015	FB	59025501	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F1-160307	03/07/2016	FB	59029521	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F2-160308	03/08/2016	FB	59029711	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F3-160309	03/09/2016	FB	59029941	0.200	U	--	**0.300**	--	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F4-160310	03/10/2016	FB	59029941	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F1-160620	6/20/2016	FB	59037101	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F2-160621	6/21/2016	FB	59037151	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F3-160622	6/22/2016	FB	59037271	0.200	U	--	**0.360**	--	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F4-160623	6/23/2016	FB	59037371	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
Field Blank	YVD-FB-160926	9/26/2016	FB	K1611506	0.100	U	--	--	R	MSD	--	--	--	0.01	U	--	--	--	--	--	--	--	**0.080**	J	--	**0.030**	J	--	0.200	U	--
Field Blank	YVD-FB-160927	9/27/2016	FB	K1611565	0.100	U	--	--	R	MSD	--	--	--	0.01	U	--	--	--	--	--	--	--	0.200	U	--	0.200	U	--	0.200	U	--
Field Blank	YVD-FB-160928	9/28/2016	FB	K1611629	0.050	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.200	U	--	**0.050**	J	--	**3.61**	--	--
Field Blank	YVD-FB-160929	9/29/2016	FB	K1611698	0.100	U	--	--	R	MSD	--	--	--	0.01	U	--	--	--	--	--	--	--	0.200	U	--	**0.050**	J	--	0.200	U	--
Field Blank	YVD-FB1-161212	12/12/2016	FB	K1615029	0.100	UJ	HTQ	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	MBK	0.200	U	MBK
Field Blank	YVD-FB2-161213	12/13/2016	FB	K1615045	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	MBK	0.200	U	--
Field Blank	YVD-FB3-161214	12/14/2016	FB	K1615083	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	MBK	**0.350**	--	--
Field Blank	YVD-FB4-161215	12/15/2016	FB	K1615126	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	MBK	0.200	U	--
Field Blank	YVD-FB5-161216	12/16/2016	FB	K1615174	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	MBK	0.200	U	--
Field Blank	YVD-030617-01	3/6/2017	FB	K1702228	0.100	U	--	**0.200**	J	--	--	--	--	0.01	U	--	--	--	--	--	--	--	**0.080**	J	--	**0.040**	J	--	0.200	U	--
Field Blank	YVD-030717-06	3/7/2017	FB	K1702324	0.100	UJ	HTQ	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	--	0.200	U	--
Field Blank	YVD-030817-11	3/8/2017	FB	K1702324	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	--	0.030	J	--
Field Blank	YVD-030917-17	3/9/2017	FB	K1702404	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	--	0.200	U	--
Field Blank	YVD-031017-26	3/10/2017	FB	K1702448	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	--	0.260	--	--
Field Blank	YVD-031317-30	3/13/2017	FB	K1702489	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	--	0.200	U	--
Field Blank	YVD-060417-01	6/4/2017	FB	K1705702	21.0	U	--	**0.700**	--	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.021	U	--	**0.110**	J	--	5.30	U	--
Field Blank	YVD-060517-07	6/5/2017	FB	K1705702	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	**0.060**	J	--	**0.110**	J	--	**0.250**	--	--
Field Blank	YVD-060617-17	6/6/2017	FB	K1705754	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	--	0.200	U	--
Field Blank	YVD-060717-28	6/7/2017	FB	K1705833	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	**0.020**	J	--	0.200	U	--
Field Blank	YVD-092517-01	9/25/2017	FB	K1710274	0.100	U	--	0.500	U	--	--	--	--	0.010	U	--	--	--	--	--	--	--	0.210	U	MBK	0.210	U	MBK	0.200	U	--
Field Blank	YVD-092617-16	9/26/2017	FB	K1710333	0.100	U	--	0.500	U	--	--	--	--	0.010	U	--	--	--	--	--	--	--	**0.090**	J	--	0.210	U	MBK	**0.860**	--	--
Field Blank	YVD-120417-01	12/4/2017	FB	K1713026	0.100	U	--	0.500	U	--	--	--	--	0.010	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	--	0.200	U	--
Field Blank	YVD-120517-32	12/5/2017	FB	K1713091	0.100	UJ	HTQ	0.500	UJ	MSD	--	--	--	0.010	U	--	--	--	--	--	--	--	0.210	U	--	**0.070**	J	--	**0.710**	--	--
Field Blank	YVD-120617-25	12/6/2017	FB	K1713157	0.100	U	--	0.500	U	--	--	--	--	0.010	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	MBK	0.200	U	--
Field Blank	YVD-031818-01	3/18/2018	FB	870610	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-031918-10	3/19/2018	FB	870634	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-060318-01	6/3/2018	FB	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-060418-12	6/4/2018	FB	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-060518-26	6/5/2018	FB	874860	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-061218-33	6/12/2018	FB	875438	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-090918-01	9/9/2018	FB	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-121018-01	12/10/2018	FB	884857	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-121118-12	12/11/2018	FB	884939	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-031719-01	3/17/2019	FB	988239	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-031819-11	3/18/2019	FB	988273	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-032019-20	3/20/2019	FB	988477	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-060219-01	6/2/2019	FB	991939	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	**0.460**	--	--
Field Blank	YVD-060319-13	6/3/2019	FB	992053	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	**0.340**	--	--
Field Blank	YVD-060419-26	6/4/2019	FB	992242	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	**0.130**	--	--
Field Blank	YVD-090919-01	9/9/2019	FB	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-090919-03	9/9/2019	FB	998357	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-091019-15	9/10/2019	FB	998438	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-091019-17	9/10/2019	FB	998438	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-120919-01	12/9/2019	FB	902276	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-120919-09	12/9/2019	FB	902276	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-121019-16	12/10/2019	FB	902321	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-121019-18	12/10/2019	FB	902321	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-033020-01	3/30/2020	FB	006241	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-033020-03	3/30/2020	FB	006241	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-033120-13	3/31/2020	FB	006260	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
Field Blank	YVD-033120-15	3/31/2020	FB	006260	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-060820-01	6/8/2020	FB	009144	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-060820-02	6/8/2020	FB	009144	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-060920-11	6/9/2020	FB	009269	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-060920-13	6/9/2020	FB	009269	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-061020-29	6/10/2020	FB	009361	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-061020-28	6/10/2020	FB	009361	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-092020-01	9/20/2020	FB	013864	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-092020-02	9/20/2020	FB	013864	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-092120-10	9/21/2020	FB	013896	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-092120-12	9/21/2020	FB	013896	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-120720-01	12/7/2020	FB	017035	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-120720-03	12/7/2020	FB	017035	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-120820-16	12/8/2020	FB	017137	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-120820-18	12/8/2020	FB	017137	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-030121-01	3/1/2021	FB	119931	0.050	U	--	1.10	J	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-030121-03	3/1/2021	FB	119931	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-030221-11	3/2/2021	FB	120034	0.050	U	--	0.800	J	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-030221-13	3/2/2021	FB	120034	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-060621-01	6/6/2021	FB	124053	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-060621-02	6/6/2021	FB	124053	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-060721-11	6/7/2021	FB	124105	0.050	U	--	0.800	J	MS, RPD	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-060721-12	6/7/2021	FB	124105	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-060821-20	6/8/2021	FB	124212	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-060821-21	6/8/2021	FB	124212	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-121421-01	12/14/2021	FB	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-121521-13	12/15/2021	FB	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-031422-01	3/14/2022	FB	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-031522-09	3/15/2022	FB	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-060522-01	6/5/2022	FB	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-060622-13	6/6/2022	FB	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-060722-23	6/7/2022	FB	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-060822-33	6/8/2022	FB	K2206299	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-091322-01	9/13/2022	FB	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-091422-14	9/14/2022	FB	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FieldQC	YVD-120622-01	12/6/2022	FB	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FieldQC	YVD-120722-08	12/7/2022	FB	K2214479	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FieldQC	YVD-120822-12	12/8/2022	FB	K2214578	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FieldQC	YVD-122722-22	12/27/2022	FB	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FieldQC	YVD-030523-01	3/5/2023	FB	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FieldQC	YVD-030623-07	3/6/2023	FB	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FieldQC	YVD-061923-01	6/19/2023	FB	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FieldQC	YVD-062023-05	6/20/2023	FB	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FieldQC	YVD-062123-21	6/21/2023	FB	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Blank Check	WW-1	4/25/2016	BC	59032861	40.0	U	--	**1.40**	--	--	--	--	--	0.25	U	--	--	--	--	--	--	--	**190**	--	--	**400**	--	--	100	U	--
Blank Check	DW-1	4/25/2016	BC	59032861	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Blank Check	DI-1	4/25/2016	BC	59032861	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--

Table 8
Historical Groundwater Analytical Results

Notes:
1. Well dry; no sample could be collected.
Bold: detected result
-- : not applicable
(as N): reported as nitrogen
(as CaCO3): reported as calcium carbonate
BC: blank check
DUP: Laboratory duplicate relative percent difference was outside acceptance limits.
EB: equipment blank
EPA: U.S. Environmental Protection Agency
ERL: elevated reporting limit
FB: field blank
FBK: field blank contamination
FD: field duplicate
FDP: Field duplicate relative percent difference exceeded acceptance limits.
HTQ: Analysis completed outside of the designated holding time.
J: The compound was positively identified; however, the associated numerical value is an estimated concentration.
J-: The result is an estimated quantity, but the result may be biased low.
J+: The result is an estimated quantity, but the result may be biased high.
MBK: method blank contamination
mg/L: milligrams per liter
MSD: The matrix spike/matrix spike duplicate percent recoveries were outside target limits.
N: normal sample
NR: Sample did not meet collection criteria; not a representative sample.
NS: Not sampled
PRS: Incorrect sample preservation.
R: The sample results are rejected as unusable. The compound may or may not be present in the sample.
RPD: Relative percent difference was outside acceptance limits.
SM: Standard Method
U: The compound was analyzed for but not detected. The associated value is the compound reporting limit, or the compound is considered non-detect at the listed value due to associated blank contamination.
UJ: The compound was not detected above the reported sample reporting limit; however, the reporting limit is approximate and may or may not represent the actual limit of quantitation.

Appendix D
Data Validation Report

1201 3rd Avenue, Suite 2600
Seattle, Washington 98101
206.287.9130

ANCHOR QEA

Data Validation Report – EPA Stage 2A

July 6, 2023

Project: Yakima Valley Dairies

Project Number: 230996-01.01

Validation Number: AQ-2023-0116

This report summarizes the review of analytical results for 17 water samples, three field duplicate samples, and three field blank samples collected between June 19-21, 2023. The samples were collected by Anchor QEA, LLC, and submitted to ALS Environmental (ALS) in Kelso, Washington. The samples were analyzed for nitrate by U.S. Environmental Protection Agency (EPA) Method 300.0.

ALS sample data groups (SDGs) K2307010 and K2307093 were reviewed in this report. Sample IDs, matrices, and analyses are presented in Table 1.

Table 1
Sample IDs, Matrices, and Analyses

Location ID	Sample ID	Lab Sample ID	Matrix	Analyses
Field blank	YVD-061923-01	K2307010-001	Water	Nitrate
DC-01	YVD-061923-02	K2307010-002	Water	Nitrate
YVD-04	YVD-061923-03	K2307010-003	Water	Nitrate
YVD-03	YVD-061923-04	K2307010-004	Water	Nitrate
Field blank	YVD-062023-05	K2307010-005	Water	Nitrate
YVD-06	YVD-062023-06	K2307010-006	Water	Nitrate
YVD-06 (FD)	YVD-062023-07	K2307010-007	Water	Nitrate
DC-05	YVD-062023-08	K2307010-008	Water	Nitrate
YVD-05	YVD-062023-09	K2307010-009	Water	Nitrate
DC-05D	YVD-062023-10	K2307010-010	Water	Nitrate
DC-04	YVD-062023-11	K2307010-011	Water	Nitrate
DC-14	YVD-062023-12	K2307010-012	Water	Nitrate
YVD-16	YVD-062023-13	K2307010-013	Water	Nitrate
YVD-13	YVD-062023-14	K2307093-001	Water	Nitrate
YVD-17	YVD-062023-15	K2307093-002	Water	Nitrate
YVD-18	YVD-062023-16	K2307093-003	Water	Nitrate
DC-03D	YVD-062023-17	K2307093-004	Water	Nitrate
DC-03D (FD)	YVD-062023-18	K2307093-005	Water	Nitrate
YVD-07	YVD-062023-19	K2307093-006	Water	Nitrate
DC-03	YVD-062023-20	K2307093-007	Water	Nitrate
Field blank	YVD-062123-21	K2307093-008	Water	Nitrate

Location ID	Sample ID	Lab Sample ID	Matrix	Analyses
DC-09	YVD-062123-22	K2307093-009	Water	Nitrate
DC-09(FD)	YVD-062123-23	K2307093-010	Water	Nitrate
YVD-11	YVD-062123-24	K2307093-011	Water	Nitrate
YVD-15	YVD-062123-25	K2307093-012	Water	Nitrate
YVD-10	YVD-062123-26	K2307093-013	Water	Nitrate
DC-07	YVD-062123-27	K2307093-014	Water	Nitrate
YVD-08	YVD-062123-28	K2307093-015	Water	Nitrate
YVD-14R	YVD-062123-29	K2307093-016	Water	Nitrate
YVD-09	YVD-062123-30	K2307093-017	Water	Nitrate
YVD-12	YVD-062123-31	K2307093-018	Water	Nitrate

Note:
FD: field duplicate

Data Validation and Qualifications

The following comments refer to the laboratory's performance in meeting the quality assurance/quality control guidelines outlined in the analytical procedures. Laboratory results were reviewed using the laboratory control limits and the following guidelines:

- *Groundwater Monitoring Quality Assurance Project Plan, Update No. 2* (Anchor QEA 2018)
- *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods* (EPA 1986)
- *National Functional Guidelines for Inorganic Superfund Data Review* (EPA 2020)

Unless noted in this report, laboratory results for the samples listed in Table 1 were within quality control criteria.

Field Documentation

Field documentation was checked for completeness and accuracy. The chain-of-custody forms were signed by ALS at the time of sample receipt. Samples were received in good condition and within the recommended temperature range.

Holding Times and Sample Preservation

Samples were appropriately preserved and analyzed within holding times with some exceptions. Since some samples were received or analyzed by the laboratory outside the recommended analytical hold time due to dilution, for nitrate by EPA Method 300.0, archive bottles were analyzed by EPA Method 353.2 to confirm no analyte loss due to the hold time exceedance and nitrate results by EPA Method 300.0 were "J" qualified to indicate a possible bias.

Laboratory Method Blanks

Laboratory method blanks were analyzed at the required frequencies. All method blanks were free of target analytes.

Quality Control

Field Blanks

Three field blanks were collected in association with these sample sets and results were non-detect.

Field Duplicates

Three field duplicates were collected in association with these sample sets. Results are summarized in Table 2.

Parent and duplicate sample results that were less than five times the reporting limit (RL) may have exaggerated relative percent differences (RPDs), so these results were assessed by the difference between them using the two times ± the parent RL as the control limit. All duplicate RPD and/or difference values were within control limits. All RPD and difference values were within control limits for both duplicate sets.

Table 2
Field Duplicate Summary

Analyte	YVD-062023-06	YVD-062023-07	RPD	Difference
Nitrate as nitrogen	0.76 mg/L	0.75J mg/L	--	0.01 mg/L

Analyte	YVD-062023-17	YVD-062023-18	RPD	Difference
Nitrate + nitrite as nitrogen	36.2 mg/L	36.3 mg/L	0%	--

Analyte	YVD-062123-22	YVD-062123-23	RPD	Difference
Nitrate as nitrogen	6.23 mg/L	5.92 mg/L	0%	--

Notes:
mg/L: milligrams per liter
--: not applicable

Laboratory Control Samples

Laboratory control samples were analyzed at the required frequencies, and all analyses resulted in recovery values within project-required control limits.

Matrix Spike and Matrix Spike Duplicate Samples

Matrix spike samples and matrix spike duplicate samples were not analyzed on project samples. Accuracy was assessed using the laboratory control sample results.

Laboratory Duplicates

Laboratory duplicates were not analyzed on project samples. Precision was evaluated using the field duplicate results.

Method Reporting Limits

RLs were acceptable as reported. All values below detection were reported using the laboratory RLs. Values were reported as undiluted, or when reported as diluted, the RL accurately reflects the dilution factor.

Overall Assessment

As was determined by this evaluation, the laboratory followed the specified analytical methods, and all requested sample analyses were completed. Accuracy was acceptable as demonstrated by the laboratory control samples. Precision was acceptable as demonstrated by the field duplicate RPD values. All data are acceptable as reported. Project completeness was 100%.

Data Qualifier Definitions

J Indicates an estimated value

Table 4
Data Qualification Summary

Sample ID	Parameter	Analyte	Reported Result	Qualified Result	Reason
All samples	Conventionals	Nitrate	All	"J" flag	Hold time exceedance

References

Anchor QEA (Anchor QEA, LLC), 2018. *Groundwater Monitoring Quality Assurance Project Plan, Update No. 2*. Prepared for Yakima Valley Dairies. March 2018.

EPA (U.S. Environmental Protection Agency), 1986. *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*. Third Edition. Office of Solid Waste and Emergency Response. EPA-530/SW-846. September 1986.

EPA, 2020. *National Functional Guidelines for Inorganic Superfund Methods Data Review*. Office of Superfund Remediation and Technology Innovation. EPA-542-R-20-006. November 2020.

Eric Winiecki Declaration
Exhibit L

949 Market Street, Suite 700
Tacoma, Washington 98402
206.287.9130

ANCHOR QEA

November 9, 2023

Eric Winiecki
United States Environmental Protection Agency
Region 10
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101-3140

Re: Third Quarter 2023 Groundwater Monitoring Data Report, Yakima Valley Dairies, SDWA-10-2013-0080

This quarterly groundwater monitoring report (report) has been prepared to supplement groundwater data collection initiated under the Administrative Order on Consent (AOC) Statement of Work.

The AOC requires 8 years of quarterly groundwater monitoring, which was completed in Second Quarter 2021. Under the AOC, this 8-year monitoring period is to be followed by data evaluation and a formal determination of next steps. This data evaluation process is ongoing.

Pending completion of the data evaluation process and definition of next steps under the AOC, the U.S. Environmental Protection Agency (EPA) and the Respondents to the AOC exchanged correspondence regarding the value of conducting continued nitrate monitoring. The monitoring data contained in this report were collected voluntarily consistent with a written proposal made by the Respondents in a letter to EPA dated October 4, 2021, and repeated in follow-up letters dated November 11, 2021, and December 10, 2021. In the December 10, 2021, letter, the Respondents informed EPA that they planned to continue voluntary groundwater monitoring beginning in Fourth Quarter 2021, and therefore the Third Quarter 2023 groundwater monitoring event was voluntarily conducted.

EPA replied to the Respondents' groundwater monitoring proposal in a letter dated January 25, 2022. In that letter, EPA stated that the AOC did not require continued groundwater monitoring at this time but that it was consistent with the goals of the AOC.

The Third Quarter 2023 groundwater monitoring event was conducted from September 10-11, 2023.

Groundwater monitoring was conducted using methods defined in the 2018 *Groundwater Monitoring Quality Assurance Project Plan* (QAPP; Anchor QEA 2018). Deviations from the QAPP as part of the Third Quarter 2023 monitoring event were as follows:

- Monitoring was performed on the subset of wells identified in the October 4, 2021, proposal from the Respondents to EPA. This excluded those wells that were dry and certain wells that

have been consistently below the nitrate maximum contaminant level (MCL) for at least the preceding eight monitoring events.

- Monitoring parameters were limited to those identified in the October 4, 2021, proposal from the Respondents to EPA and included groundwater elevation, groundwater field parameters, and nitrate concentrations.

The locations of the monitoring wells are shown in Figure 1. The wells monitored in the current event are listed in Table 1.

Groundwater Monitoring Activities

Depth to Static Water Level Measurement

Water level measurements were collected from all 26 wells in the monitoring network on September 10, 2023, using an electronic water level meter. The depths to water were measured to the nearest 0.01 foot from the indicated reference point on each well casing and recorded on the Water Level Survey Form presented in Appendix D of the 2018 QAPP. The depth-to-water measurements were collected from the 26 wells in as short a time period as possible (approximately 8 hours) to provide a "snapshot" of groundwater elevations and to reduce the effect of atmospheric pressure changes or precipitation events on the water levels. Depth-to-water measurements were converted to groundwater elevations in the North American Vertical Datum of 1988 (NAVD88) by subtracting the measurements from the surveyed reference point elevation for each well. The depth-to-water measurements and calculated groundwater elevations for Third Quarter 2023 are shown in Table 2.

Groundwater Elevation Trends

Non-vented Solinst Levelogger Junior Edge pressure transducers were initially installed in six wells (YVD-03, YVD-08, YVD-11, DC-03, DC-05, and DC-05D), along with a Solinst Barologger Edge barometric pressure transducer deployed at well YVD-08 to compensate water levels for atmospheric pressure. However, the transducers are no longer operational due to equipment failures.

Groundwater elevation trends continue to be monitored using the quarterly groundwater elevation measurements. Groundwater hydrographs developed from these data are included in Appendix A of this report for all wells.

Groundwater Elevation Seasonal Patterns

The hydrographs for many of the monitoring wells show a seasonal pattern of water level increases and decreases. For example, the water level in monitoring well YVD-02 historically increased about 12 feet from first quarter to second quarter before an adjacent irrigation ditch was converted to a closed pipe, after which the seasonal pattern became less pronounced and the well eventually went dry.

Another example of seasonal water level fluctuation is observed in well YVD-17, which is located adjacent to the large, unlined Southside irrigation canal run by the Sunnyside Valley Irrigation District (Figure 1). According to the District fact sheet, irrigation usually runs from April 1 through October 20 with canal priming operations beginning in mid-March. The water elevation in YVD-17 varies seasonally by about 6 feet. The lowest water level of each year has consistently occurred in the first quarter (approximately April 1), and the highest water level of each year has consistently occurred in the third quarter (approximately October 1). This suggests that the travel time of water from the flowing irrigation canal to the relatively shallow drinking water aquifer at YVD-17 is likely in the range of days to weeks.

EPA has concluded that the seasonal fluctuations observed at monitoring wells indicate that percolation of water from the land surface to the aquifer can and does occur in a range of days to months. The time of travel depends on many factors including the soil type, existing amount of water in the soil, the duration and amount of water, evapotranspiration, and depth to the water table. The percolating water could originate from surface water such as a canal or pond, excess irrigation water from a field, an earthen lagoon, precipitation, or some other source. The groundwater elevation seasonal patterns for each monitoring well are shown in Figure 2 and the following table:

Monitoring Well ID	Clear Seasonal Pattern? (Y/N)	Well Depth from Ground Surface to Mid-Point of Screen (feet)	Highest Groundwater Elevation in 3Q (Fall) and Lowest in 1Q (Spring)	Highest Groundwater Elevation in 4Q (Winter) and Lowest in 2Q (Summer)	Highest Groundwater Elevation in 1Q (Spring) and Lowest in 3Q (Fall)
YVD-17	Y	38	X		
DC-04	Y	40	X		
DC-07	Y	49		X	
DC-03	Y	73	X		
DC-05	Y	74		X	
YVD-14R	Y	81		X	
YVD-10	Y	93			X
YVD-15	Y	95		X	
YVD-11	N	107			
DC-03D	Y	111	X		
YVD-09	N	112			
YVD-16	Y	112			X
DC-05D	Y	122		X	
YVD-13	Y	131		X	
DC-14	N	139			
YVD-12	Y	141			X
DC-01	N	150			

Monitoring Well ID	Clear Seasonal Pattern? (Y/N)	Well Depth from Ground Surface to Mid-Point of Screen (feet)	Highest Groundwater Elevation in 3Q (Fall) and Lowest in 1Q (Spring)	Highest Groundwater Elevation in 4Q (Winter) and Lowest in 2Q (Summer)	Highest Groundwater Elevation in 1Q (Spring) and Lowest in 3Q (Fall)
YVD-07	Y	158			X
YVD-06	Y	159			X
YVD-05	Y	172			X
YVD-08	Y	172			X
YVD-18	Y	175		X	
DC-09	Y	184			X
YVD-03	Y	190			X
YVD-04	Y	235			X

Sample Collection

Groundwater samples were collected using low-flow purging and sampling procedures described in the Standard Operating Procedure entitled *Low-Flow Groundwater Purging and Sampling Procedures for Monitoring Wells* presented in Appendix E of the 2018 QAPP.

Purging and sampling of the monitoring wells were performed with dedicated 1-inch-diameter stainless-steel Solinst Model 407 bladder pumps with polytetrafluoroethylene (Teflon) bladders installed in each well.

A sample could not be collected at monitoring well YVD-02; the well was dry during the groundwater monitoring event.

Sample Handling and Custody

All samples were accompanied by a chain-of-custody record according to procedures described in the 2018 QAPP. When custody of samples was transferred, the individuals relinquishing and receiving the samples signed and dated the chain-of-custody record. The chain-of-custody record documents the custody transfer from the sampler, often through another agent (e.g., a shipping/transport company), to the laboratory sample custodian.

All samples collected for laboratory analyses were delivered to ALS Environmental, located at 1317 S. 13th Ave. in Kelso, Washington. Two sample delivery groups were submitted to the analytical laboratory; the delivery groups and collection dates are as follows:

Sample Delivery Group	Samples Collected	Date Received by Laboratory
K2310138	September 10 and 11, 2023	September 12, 2023
K2310209	September 11, 2023	September 13, 2023

Field Sampling Data Sheets were completed for each sample and indicate what type of samples were collected, sample identification, sample bottle types and volumes collected, field parameter measurements, and other pertinent information (including significant events and observations that occurred during sampling activities). Enough information was noted on field sampling forms to enable participants to reconstruct events that occurred and to refresh the memory of field personnel, if needed. Original copies of all field forms and chain-of-custody documents were retained by the Yakima Valley Dairies'[1] Field Lead in the project files. Dairy owner certifications are included in Appendix B. Copies of the field forms from Third Quarter 2023 are presented in Appendix C.

Analytical Program

Corrective Actions

No corrective actions were required for the Third Quarter 2023 sampling event.

Data Review, Verification, and Validation

All data underwent a Stage 2 validation, which included a data package completeness review. Data were validated in accordance with the EPA *National Functional Guidelines for Superfund Organic Methods Data Review* (EPA 2014). The Data Validation Report (DVR) is presented in Appendix D. Data qualified as a result of data validation are listed as follows:

- Five samples from Sample Delivery Group K2310138 were analyzed outside of the 48-hour hold time for nitrate (as nitrogen) by EPA Method 300.0. Those results have been assigned a "J" qualifier to indicate that they are estimated.
- All five samples from Sample Delivery Group K2310209 were analyzed outside of the 48-hour hold time for nitrate (as nitrogen) by EPA Method 300.0. Those results have been assigned a "J" qualifier to indicate that they are estimated.

[1] Collectively, the following are referred to as the Yakima Valley Dairies: 1) Cow Palace, LLC; 2) D&A Dairy, LLC (also known as D and A Dairy L.L.C.), George DeRuyter & Son Dairy, LLC, and George & Margaret, LLC; and 3) Liberty Dairy, LLC, and its associated dairy facility H&S Bosma Dairy.

Any deviation from the 2018 QAPP was either documented within this memorandum or in the DVR. Results met project data quality goals and criteria and are usable for all purposes.

Groundwater Monitoring Results

Site Hydrogeology

The groundwater flow direction at the site is generally to the southwest at an average hydraulic gradient of 0.013.[2] Hydraulic gradients are greater in the topographically higher areas in the northern section of the site, with an average of 0.026. As groundwater flows to the southwest toward the center of the Yakima River valley, hydraulic gradients decrease to approximately 0.011 in the central portion of the site and then decrease further to 0.004 in the southern portion of the site. The estimated average linear groundwater flow velocities for the shallow surficial aquifer at the Dairies range from 0.7 to 24.8 feet per day across the site. These estimated values are based on estimated hydraulic conductivity values based on observed soil types and have not been confirmed with site-specific aquifer testing (e.g., slug tests).

A groundwater elevation contour map for the surficial aquifer based on Third Quarter 2023 depth to groundwater measurements is shown in Figure 1. Groundwater elevation measurements for Third Quarter 2023 and monitoring well construction details are provided in Tables 2 and 3, respectively. Historical groundwater elevations are provided in Table 4. Estimated possible average linear flow velocity values for Third Quarter 2023 are provided in Table 5. Groundwater hydrographs for all 26 wells are provided in Appendix A.

Groundwater Sampling Results

Groundwater field parameters collected during well purging included dissolved oxygen, pH, oxidation-reduction potential, specific conductance, temperature, and turbidity. Field parameter measurements are presented in Table 6.

Groundwater from the 17 wells sampled was analyzed for nitrate (as nitrogen) by EPA Method 300.0.

The nitrate results for Third Quarter 2023 are presented spatially on a map in Figure 3 and are shown in Table 7. Historical nitrate concentrations from 2013 through 2017 are presented in Figure 4a and from 2018 to present in Figure 4b. Nitrate concentration trend plots are presented in Figures 5 through 9. A summary of historical groundwater analytical results is presented in Table 8. Analytical laboratory reports are provided in Appendix E.

The monitoring well network includes wells that are located upgradient and downgradient of the Dairies. There are four groundwater monitoring wells located upgradient of the Dairy facilities' footprint. All four wells are screened at the water table. Historically, the nitrate concentrations in the

[2] Hydraulic gradients values are in units of vertical feet per horizontal feet and are presented unitless.

four upgradient wells have been consistently below the nitrate MCL of 10 milligrams per liter (mg/L). As noted previously, YVD-02 was dry during Third Quarter 2023, and a sample could not be collected. YVD-02 is screened in a shallow basalt layer just downgradient of a former irrigation canal that has now been replaced by an enclosed pipe. After the open ditch was replaced by the piped conveyance, groundwater elevations decreased in the well until the well went dry; a sample has not been collected from YVD-02 since Second Quarter 2020.

Nitrate concentrations reported in mg/L in the upgradient monitoring well for Third Quarter 2023 are as follows:

Upgradient Well	Nitrate (mg/L)
YVD-02	Dry – Not Sampled

Nitrate concentrations in the 14 downgradient monitoring wells that are screened at the water table for Third Quarter 2023 are as follows:

Downgradient Water Table Wells	Nitrate (mg/L)
DC-03	139 J
DC-04	24.9 J
DC-05	41.5
DC-07	4.40
DC-14	49.9
YVD-08	76.9 J
YVD-09	65.7
YVD-10	70.3 J
YVD-11	104 J
YVD-12	15.7
YVD-13	36.1 J
YVD-14R	114
YVD-15	13.0 J
YVD-16	25.3

Note:
J: estimated value

The nitrate concentration in one downgradient water table well (DC-07) was below the nitrate MCL during this monitoring event.

Recent trends in nitrate concentrations in wells screened at the water table include the following:

- Nitrate was detected at a concentration of 139 mg/L at well DC-03 in Third Quarter 2023. The four historically lowest concentrations have been detected in the previous four quarters (138 mg/L in Fourth Quarter 2022, 140 mg/L in First Quarter 2023, 130 mg/L in Second Quarter 2023, and 139 mg/L in Third Quarter 2023).
- Nitrate was detected at a concentration of 115 mg/L at well YVD-14R. Nitrate concentrations have been slowly decreasing in this well from a historical high of 140 mg/L in Third Quarter 2019.
- Nitrate concentrations at well DC-07 have been below the MCL for four consecutive quarters after being above the MCL for seven of the ten previous quarters.
- Nitrate concentrations have decreased for five consecutive quarters at well DC-14 (from 57.4 mg/L in Second Quarter 2022 to 49.9 mg/L in Third Quarter 2023). Data indicate that the increasing trend noted between 2018 and 2022 in this well has terminated.
- Nitrate was detected at a concentration of 41.5 mg/L at well DC-05. This is close to the historical high concentration detected at this well (43.5 mg/L in Fourth Quarter 2021) and occurs after three consecutive quarters of historically low concentrations (between 10.0 and 19.0 mg/L) from Third Quarter 2022 through First Quarter 2023.
- Nitrate was detected at a concentration of 70.3 mg/L in well YVD-10. Nitrate concentrations have been generally decreasing in this well, with fluctuations, since a historical high concentration of 123 mg/L in First Quarter 2017.

Three downgradient groundwater monitoring wells were constructed with well screens positioned at depths that were estimated by EPA to approximate the depth of a typical residential drinking water well in the area. Each of these deeper wells was paired at the same location with a water table well. The results for each well pair, with the water table well listed above its deeper counterpart, are as follows:

Well Placement	Shallow/Deep Well Pair	Nitrate (mg/L)	Shallow/Deep Well Pair	Nitrate (mg/L)	Shallow/Deep Well Pair	Nitrate (mg/L)
Shallow Well	YVD-13	36.1 J	DC-03	139 J	DC-05	41.5
Deep Well	YVD-18	28.4 J	DC-03D	36.7 J	DC-05D	11.4 J

Note:
J: estimated value

The results from all the well pairs indicate stratified conditions, with generally higher nitrate concentrations at the top of the water table and lower concentrations at depth. Nitrate concentration trends at well pairs are detailed as follows:

- The nitrate concentrations in the YVD-13/YVD-18 well pair were initially higher in the shallow well (YVD-13) but then approximately equal from First Quarter 2017 through Second Quarter 2019.

Since Third Quarter 2019, nitrate concentrations in water table well YVD-13 have been increasing relative to the deeper well YVD-18.

- Nitrate concentrations in water table well DC-05 have historically been greater than co-located deeper well DC-05D. The nitrate concentrations in DC-05D have historically been slightly greater than the nitrate MCL.
- Nitrate concentrations in water table well DC-03 have decreased significantly since First Quarter 2022 to a concentration of 139 mg/L in Third Quarter 2023. Nitrate concentrations in well DC-03D remain much lower and are generally stable without significant increases or decreases over time.

EPA has not yet approved formal trend analyses procedures for use with the project. See Figures 5 through 9 for plots of observed nitrate concentrations over time in the AOC monitoring wells.

References

Anchor QEA (Anchor QEA, LLC), 2018. *Groundwater Monitoring Quality Assurance Project Plan*. Yakima Valley Dairies/SDWA-10-2013-0080. Prepared for Yakima Valley Dairies. February 2018.

EPA (U.S. Environmental Protection Agency), 2014. *National Functional Guidelines for Superfund Organic Methods Data Review*. Office of Superfund Remediation and Technology Innovation, U.S. Environmental Protection Agency, Washington, DC. EPA-540-R-014-002. August 2014.

Recipients

Adam Dolsen, Cow Palace, LLC
Dan DeRuyter, George DeRuyter & Son Dairy, LLC; D&A Dairy, LLC; George & Margaret, LLC
Henry Bosma, Liberty Dairy, LLC; H&S Bosma Dairy
Eric Winiecki, U.S. Environmental Protection Agency, Region 10
Charles Clabaugh, U.S. Environmental Protection Agency, Region 10
Jennifer MacDonald, U.S. Environmental Protection Agency, Region 10
John (Matthew) Moore, U.S. Environmental Protection Agency, Region 10
Meredith Weinberg, Perkins Coie LLP
Brendan Monahan, Stokes Lawrence PS
Lori Terri Gregory, Foster Pepper PLLC
Mark Larsen, Anchor QEA, LLC

Accompanying Materials

Tables

Table 1	Groundwater Monitoring Frequency
Table 2	Summary of Groundwater Elevations – Third Quarter 2023
Table 3	Monitoring Well Construction Details
Table 4	Historical Groundwater Elevations
Table 5	Estimated Possible Average Linear Groundwater Flow Velocities – Third Quarter 2023
Table 6	Field Parameter Measurements – Third Quarter 2023
Table 7	Groundwater Analytical Results – Third Quarter 2023
Table 8	Historical Groundwater Analytical Results

Figures

Figure 1	Surficial Aquifer Groundwater Elevation Contour Map Third Quarter 2023
Figure 2	Seasonal Groundwater Elevation Patterns
Figure 3	Nitrate Concentrations in Groundwater Third Quarter 2023
Figure 4a	Historical Nitrate Concentrations in Groundwater – 2013 through 2017
Figure 4b	Historical Nitrate Concentrations in Groundwater – 2018 to present
Figure 5	Nitrate Concentrations – East Downgradient Wells
Figure 6	Nitrate Concentrations – West Downgradient Wells
Figure 7	Nitrate Concentrations – Central Downgradient Wells
Figure 8	Nitrate Concentrations – Northern Downgradient Wells
Figure 9	Nitrate Concentrations – Upgradient Wells

Appendices

Appendix A	Groundwater Hydrographs
Appendix B	Owner Certifications
Appendix C	Groundwater Sampling Records
Appendix D	Data Validation Report
Appendix E	Analytical Laboratory Reports

Tables

Table 1
Groundwater Monitoring Frequency

Well ID	Manual Groundwater Elevation Measurements (Quarterly)	Long-Term Groundwater Elevation Measurements (Every Quarter Hour)	Groundwater Sampling Frequency	
			Quarterly	Annually (Second Quarter Event)
DC-01	X			X
DC-03	X	X	X	X
DC-03D	X		X	X
DC-04	X		X	X
DC-05	X	X[3]	X	X
DC-05D	X	X[3]	X	X
DC-07	X		X	X
DC-09	X			X
DC-14	X		X	X
YVD-02[2]	X		X[2]	X[2]
YVD-03	X	X[1]		X
YVD-04	X			X
YVD-05	X			X
YVD-06	X			X
YVD-07	X			X
YVD-08	X	X[1]	X	X
YVD-09	X		X	X
YVD-10	X		X	X
YVD-11	X	X[3]	X	X
YVD-12	X		X	X
YVD-13	X		X	X
YVD-14R	X		X	X
YVD-15	X		X	X
YVD-16	X		X	X
YVD-17	X			X
YVD-18	X		X	X

Notes:
1. These wells currently do not have installed transducers. The transducers in these two wells fell down the wells on December 14, 2021, and have not been recovered or replaced.
2. YVD-02 has been dry since Second Quarter 2020 and cannot currently be sampled.
3. These wells currently do not have installed transducers. The transducers in these two wells would not connect to the downloading device and were sent to the manufacturer for data extraction. The transducers have not been replaced in the wells.

Table 2
Summary of Groundwater Elevations – Third Quarter 2023

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
DC-01	9/10/2023	1199.17	151.15	1048.02
DC-03	9/10/2023	910.58	76.74	833.84
DC-03D	9/10/2023	911.33	77.36	833.97
DC-04	9/10/2023	877.22	38.55	838.67
DC-05	9/10/2023	911.95	75.09	836.86
DC-05D	9/10/2023	915.91	78.65	837.26
DC-07	9/10/2023	889.29	49.80	839.49
DC-09	9/10/2023	1048.60	166.75	881.85
DC-14	9/10/2023	1036.61	139.35	897.26
YVD-02	9/10/2023	1288.97	Dry	---
YVD-03	9/10/2023	1120.68	197.62	923.06
YVD-04	9/10/2023	1118.66	231.89	886.77
YVD-05	9/10/2023	1051.78	175.25	876.53
YVD-06	9/10/2023	1053.51	111.42	942.09
YVD-07	9/10/2023	1073.03	159.44	913.59
YVD-08	9/10/2023	1014.38	176.78	837.60
YVD-09	9/10/2023	966.81	115.56	851.25
YVD-10	9/10/2023	958.00	96.20	861.80
YVD-11	9/10/2023	967.91	112.18	855.73
YVD-12	9/10/2023	961.91	142.72	819.19
YVD-13	9/10/2023	965.59	131.62	833.97
YVD-14R	9/10/2023	921.41	82.65	838.76
YVD-15	9/10/2023	940.61	98.11	842.50
YVD-16	9/10/2023	975.90	121.05	854.85
YVD-17	9/10/2023	866.73	35.18	831.55
YVD-18	9/10/2023	965.74	131.73	834.01

Notes:

---: no value or not applicable

BTOC: below top of casing

NAVD88: North American Vertical Datum of 1988

Table 3
Monitoring Well Construction Details

Well ID	Coordinates		Top of Casing Elevation (feet NAVD88)	Ground Surface Elevation (feet NAVD88)	Surface Completion	Well Depth (feet bgs)	Casing and Screen Material	Screen Slot Size (inches)	Screen Length (feet)	Depth to Top of Screen (feet bgs)	Depth to Bottom of Screen (feet bgs)	Elevation of Top of Screen (feet NAVD88)	Elevation of Base of Screen (feet NAVD88)	Depth to Top of Filter Pack (feet bgs)	Depth to Bottom of Filter Pack (feet bgs)
	Latitude	Longitude													
Monitoring Wells															
DC-01	46.418795	-120.138185	1199.17	1199.64	Flush	160.0	Schedule 40 PVC	0.020	20.0	140.0	160.0	1059.6	1039.6	136.0	160.0
DC-03	46.386289	-120.146145	910.58	911.04	Flush	85.0	Schedule 40 PVC	0.020	20.0	62.5	82.5	848.5	828.5	58.5	85.0
DC-03D	46.386220	-120.146054	911.33	908.83	Stick-up	116.1	Schedule 40 PVC	0.020	9.5	106.1	115.6	802.7	793.2	100.0	116.5
DC-04	46.382446	-120.131129	877.22	877.62	Flush	51.0	Schedule 40 PVC	0.020	20.0	29.5	49.5	848.1	828.1	24.5	51.0
DC-05	46.382358	-120.120237	911.95	912.35	Flush	86.0	Schedule 40 PVC	0.020	20.0	63.5	83.5	848.9	828.9	59.5	86.0
DC-05D	46.382517	-120.120210	915.91	913.55	Stick-up	126.8	Schedule 40 PVC	0.020	9.5	116.8	126.3	796.8	787.3	114.0	128.0
DC-07	46.389612	-120.141671	889.29	889.78	Flush	61.0	Schedule 40 PVC	0.020	20.0	38.5	58.5	851.3	831.3	34.5	61.0
DC-09	46.404230	-120.120858	1048.60	1048.97	Flush	196.0	Schedule 40 PVC	0.020	20.0	173.5	193.5	875.5	855.5	169.5	196.0
DC-14	46.404240	-120.139685	1036.61	1036.92	Flush	151.0	Schedule 40 PVC	0.020	20.0	128.5	148.5	908.4	888.4	124.5	151.0
YVD-02	46.422601	-120.113697	1288.97	1285.81	Stick-up	35.0	Schedule 40 PVC	0.020	19.5	15.0	34.5	1270.8	1251.3	13.0	36.0
YVD-03	46.414227	-120.139638	1120.68	1118.15	Stick-up	200.1	Schedule 40 PVC	0.020	19.5	180.1	199.6	938.1	918.6	176.0	202.0
YVD-04	46.408062	-120.156224	1118.66	1116.06	Stick-up	245.2	Schedule 40 PVC	0.020	19.5	225.2	244.7	890.9	871.4	220.0	248.0
YVD-05	46.404457	-120.142790	1051.78	1052.26	Flush	182.2	Schedule 40 PVC	0.020	19.5	162.2	181.7	890.1	870.6	156.0	208.0
YVD-06	46.407671	-120.137191	1053.51	1053.88	Flush	169.0	Schedule 40 PVC	0.020	19.5	149.0	168.5	904.9	885.4	144.0	170.0
YVD-07	46.404432	-120.125205	1073.03	1070.59	Stick-up	168.3	Schedule 40 PVC	0.020	19.5	148.3	167.8	922.3	902.8	145.0	169.0
YVD-08	46.396920	-120.152771	1014.38	1011.92	Stick-up	182.5	Schedule 40 PVC	0.020	19.5	162.5	182.0	849.4	829.9	155.0	188.0
YVD-09	46.396832	-120.144078	966.81	964.28	Stick-up	122.3	Schedule 40 PVC	0.020	19.5	102.3	121.8	862.0	842.5	9.5	128.0
YVD-10	46.396978	-120.136165	958.00	955.45	Stick-up	103.1	Schedule 40 PVC	0.020	19.5	83.1	102.6	872.4	852.9	76.0	103.5
YVD-11	46.393446	-120.123627	967.91	965.51	Stick-up	116.9	Schedule 40 PVC	0.020	19.5	96.9	116.4	868.6	849.1	94.0	117.3
YVD-12	46.389730	-120.166996	961.91	959.51	Stick-up	151.4	Schedule 40 PVC	0.020	19.5	131.4	150.9	828.1	808.6	127.0	154.0
YVD-13	46.389708	-120.151673	965.59	963.07	Stick-up	141.0	Schedule 40 PVC	0.020	19.5	121.0	140.5	842.1	822.6	117.0	148.0
YVD-14R	46.389532	-120.145124	920.19	918.80	Stick-up	93.0	Schedule 40 PVC	0.020	20.0	72.0	92.0	846.8	826.8	69.0	93.0
YVD-15	46.389802	-120.137153	940.61	938.08	Stick-up	105.1	Schedule 40 PVC	0.020	19.5	85.1	104.6	853.0	833.5	81.0	128.0
YVD-16	46.389586	-120.114783	975.90	972.99	Stick-up	122.1	Schedule 40 PVC	0.020	19.5	102.1	121.6	870.9	851.4	100.5	127.0
YVD-17	46.380761	-120.142067	866.73	864.28	Stick-up	47.7	Schedule 40 PVC	0.020	19.5	27.7	47.2	836.6	817.1	25.0	58.0
YVD-18	46.389758	-120.151671	965.74	963.42	Stick-up	179.9	Schedule 40 PVC	0.020	9.5	169.9	179.4	793.5	784.0	166.0	181.5
Decommissioned Wells															
YVD-14	46.389536	-120.145067	920.19	917.64	Stick-up	91.0	Schedule 40 PVC	0.020	19.5	71.0	90.5	846.6	827.1	66.0	98.0

Notes:
Latitude and longitude in decimal degrees based on World Geodetic Survey 1984.
bgs: below ground surface
NAVD88: North American Vertical Datum of 1988
PVC: polyvinyl chloride

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
DC-01	9/16/2013	1199.17	150.45	1048.72
DC-01	12/9/2013	1199.17	150.66	1048.51
DC-01	3/16/2014	1199.17	150.43	1048.74
DC-01	6/1/2014	1199.17	150.50	1048.67
DC-01	9/21/2014	1199.17	150.32	1048.85
DC-01	12/14/2014	1199.17	150.20	1048.97
DC-01	3/5/2015	1199.17	150.35	1048.82
DC-01	6/15/2015	1199.17	150.41	1048.76
DC-01	9/21/2015	1199.17	150.50	1048.67
DC-01	12/13/2015	1199.17	150.46	1048.71
DC-01	3/8/2016	1199.17	150.53	1048.64
DC-01	6/19/2016	1199.17	150.70	1048.47
DC-01	9/25/2016	1199.17	150.70	1048.47
DC-01	12/11/2016	1199.17	150.65	1048.52
DC-01	3/5/2017	1199.17	150.55	1048.62
DC-01	6/4/2017	1199.17	150.68	1048.49
DC-01	9/27/2017	1199.17	150.81	1048.36
DC-01	12/3/2017	1199.17	150.74	1048.43
DC-01	3/18/2018	1199.17	150.74	1048.43
DC-01	6/3/2018	1199.17	150.74	1048.43
DC-01	9/8/2018	1199.17	150.44	1048.73
DC-01	12/9/2018	1199.17	150.94	1048.23
DC-01	3/21/2019	1199.17	150.78	1048.39
DC-01	6/1/2019	1199.17	150.85	1048.32
DC-01	9/8/2019	1199.17	150.77	1048.40
DC-01	12/8/2019	1199.17	150.79	1048.38
DC-01	3/29/2020	1199.17	150.74	1048.43
DC-01	6/7/2020	1199.17	150.87	1048.30
DC-01	9/20/2020	1199.17	150.97	1048.20
DC-01	12/6/2020	1199.17	151.06	1048.11
DC-01	2/28/2021	1199.17	150.99	1048.18
DC-01	6/6/2021	1199.17	150.86	1048.31
DC-01	9/20/2021	1199.17	151.13	1048.04
DC-01	12/14/2021	1199.17	150.85	1048.32
DC-01	3/14/2022	1199.17	150.95	1048.22
DC-01	6/5/2022	1199.17	150.84	1048.33
DC-01	9/12/2022	1199.17	151.07	1048.10
DC-01	12/5/2022	1199.17	151.10	1048.07
DC-01	3/5/2023	1199.17	151.02	1048.15
DC-01	6/4/2023	1199.17	151.12	1048.05
DC-01	9/10/2023	1199.17	151.15	1048.02
DC-03	9/16/2013	910.58	72.43	838.15
DC-03	12/9/2013	910.58	72.55	838.03
DC-03	3/16/2014	910.58	73.62	836.96

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
DC-03	6/1/2014	910.58	73.25	837.33
DC-03	9/21/2014	910.58	72.26	838.32
DC-03	12/14/2014	910.58	72.40	838.18
DC-03	3/5/2015	910.58	73.60	836.98
DC-03	6/15/2015	910.58	73.12	837.46
DC-03	9/21/2015	910.58	72.35	838.23
DC-03	12/13/2015	910.58	73.64	837.94
DC-03	3/8/2016	910.58	73.99	836.59
DC-03	6/19/2016	910.58	73.84	836.74
DC-03	9/25/2016	910.58	72.87	837.71
DC-03	12/11/2016	910.58	72.93	837.65
DC-03	3/5/2017	910.58	74.20	836.38
DC-03	6/4/2017	910.58	74.21	836.37
DC-03	9/27/2017	910.58	72.81	837.77
DC-03	12/3/2017	910.58	73.11	837.47
DC-03	3/18/2018	910.58	74.54	836.04
DC-03	6/3/2018	910.58	74.08	836.50
DC-03	9/8/2018	910.58	73.24	837.34
DC-03	12/9/2018	910.58	73.32	837.26
DC-03	3/21/2019	910.58	75.01	835.57
DC-03	6/1/2019	910.58	74.94	835.64
DC-03	9/8/2019	910.58	73.95	836.63
DC-03	12/8/2019	910.58	74.10	836.48
DC-03	3/29/2020	910.58	75.90	834.68
DC-03	6/7/2020	910.58	75.52	835.06
DC-03	9/20/2020	910.58	74.46	836.12
DC-03	12/6/2020	910.58	74.56	836.02
DC-03	2/28/2021	910.58	75.94	834.64
DC-03	6/6/2021	910.58	75.89	834.69
DC-03	9/20/2021	910.58	74.90	835.68
DC-03	12/14/2021	910.58	75.22	835.36
DC-03	3/14/2022	910.58	76.71	833.87
DC-03	6/5/2022	910.58	76.44	834.14
DC-03	9/12/2022	910.58	75.79	834.79
DC-03	12/5/2022	910.58	75.91	834.67
DC-03	3/5/2023	910.58	77.45	833.13
DC-03	6/4/2023	910.58	77.61	832.97
DC-03	9/10/2023	910.58	76.74	833.84
DC-03D	9/16/2013	911.33	73.03	838.30
DC-03D	12/9/2013	911.33	73.16	838.17
DC-03D	3/16/2014	911.33	74.35	836.98
DC-03D	6/1/2014	911.33	73.90	837.43
DC-03D	9/21/2014	911.33	72.87	838.46
DC-03D	12/14/2014	911.33	73.13	838.20

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
DC-03D	3/5/2015	911.33	74.28	837.05
DC-03D	6/15/2015	911.33	73.72	837.61
DC-03D	9/21/2015	911.33	72.96	838.37
DC-03D	12/13/2015	911.33	73.31	838.02
DC-03D	3/8/2016	911.33	74.66	836.67
DC-03D	6/19/2016	911.33	74.47	836.86
DC-03D	9/25/2016	911.33	73.44	837.89
DC-03D	12/11/2016	911.33	73.73	837.60
DC-03D	3/5/2017	911.33	75.05	836.28
DC-03D	6/4/2017	911.33	74.88	836.45
DC-03D	9/27/2017	911.33	73.42	837.91
DC-03D	12/3/2017	911.33	73.80	837.53
DC-03D	3/18/2018	911.33	75.30	836.03
DC-03D	6/3/2018	911.33	74.82	836.51
DC-03D	9/8/2018	911.33	73.78	837.55
DC-03D	12/9/2018	911.33	74.01	837.32
DC-03D	3/21/2019	911.33	75.75	835.58
DC-03D	6/1/2019	911.33	75.65	835.68
DC-03D	9/8/2019	911.33	74.55	836.78
DC-03D	12/8/2019	911.33	74.79	836.54
DC-03D	3/29/2020	911.33	76.49	834.84
DC-03D	6/7/2020	911.33	76.19	835.14
DC-03D	9/20/2020	911.33	75.06	836.27
DC-03D	12/6/2020	911.33	75.24	836.09
DC-03D	2/28/2021	911.33	76.66	834.67
DC-03D	6/6/2021	911.33	76.57	834.76
DC-03D	9/20/2021	911.33	75.53	835.80
DC-03D	12/14/2021	911.33	75.88	835.45
DC-03D	3/14/2022	911.33	77.42	833.91
DC-03D	6/5/2022	911.33	77.11	834.22
DC-03D	9/12/2022	911.33	76.46	834.87
DC-03D	12/5/2022	911.33	76.51	834.82
DC-03D	3/5/2023	911.33	78.14	833.19
DC-03D	6/4/2023	911.33	78.27	833.06
DC-03D	9/10/2023	911.33	77.36	833.97
DC-04	9/16/2013	877.22	31.75	845.47
DC-04	12/9/2013	877.22	32.61	844.61
DC-04	3/16/2014	877.22	34.55	842.67
DC-04	6/1/2014	877.22	34.65	842.57
DC-04	9/21/2014	877.22	31.99	845.23
DC-04	12/14/2014	877.22	32.98	844.24
DC-04	3/5/2015	877.22	34.31	842.91
DC-04	6/15/2015	877.22	34.70	842.52
DC-04	9/21/2015	877.22	33.61	843.61

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
DC-04	12/13/2015	877.22	34.38	842.84
DC-04	3/8/2016	877.22	35.60	841.62
DC-04	6/19/2016	877.22	34.74	842.48
DC-04	9/25/2016	877.22	33.81	843.41
DC-04	12/11/2016	877.22	34.33	842.89
DC-04	3/5/2017	877.22	35.45	841.77
DC-04	6/4/2017	877.22	35.63	841.59
DC-04	9/27/2017	877.22	34.42	842.80
DC-04	12/3/2017	877.22	35.17	842.05
DC-04	3/18/2018	877.22	36.89	840.33
DC-04	6/3/2018	877.22	37.17	840.05
DC-04	9/8/2018	877.22	36.45	840.77
DC-04	12/9/2018	877.22	36.17	841.05
DC-04	3/21/2019	877.22	37.73	839.49
DC-04	6/1/2019	877.22	38.20	839.02
DC-04	9/8/2019	877.22	36.96	840.26
DC-04	12/8/2019	877.22	36.83	840.39
DC-04	3/29/2020	877.22	38.37	838.85
DC-04	6/7/2020	877.22	38.58	838.64
DC-04	9/20/2020	877.22	37.23	839.99
DC-04	12/6/2020	877.22	36.76	840.46
DC-04	2/28/2021	877.22	38.35	838.87
DC-04	6/6/2021	877.22	39.12	838.10
DC-04	9/20/2021	877.22	38.19	839.03
DC-04	12/14/2021	877.22	37.91	839.31
DC-04	3/14/2022	877.22	39.32	837.90
DC-04	6/5/2022	877.22	39.47	837.75
DC-04	9/12/2022	877.22	38.50	838.72
DC-04	12/5/2022	877.22	38.05	839.17
DC-04	3/5/2023	877.22	39.51	837.71
DC-04	6/4/2023	877.22	40.05	837.17
DC-04	9/10/2023	877.22	38.55	838.67
DC-05	9/16/2013	911.95	67.78	844.17
DC-05	12/9/2013	911.95	68.28	843.67
DC-05	3/16/2014	911.95	69.25	842.70
DC-05	6/1/2014	911.95	70.15	841.80
DC-05	9/21/2014	911.95	69.43	842.52
DC-05	12/14/2014	911.95	68.80	843.15
DC-05	3/5/2015	911.95	69.33	842.62
DC-05	6/15/2015	911.95	70.28	841.67
DC-05	9/21/2015	911.95	69.94	842.01
DC-05	12/13/2015	911.95	69.59	842.36
DC-05	3/8/2016	911.95	70.58	841.37
DC-05	6/19/2016	911.95	71.43	840.52

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
DC-05	9/25/2016	911.95	71.08	840.87
DC-05	12/11/2016	911.95	70.24	841.71
DC-05	3/5/2017	911.95	70.98	840.97
DC-05	6/4/2017	911.95	71.81	840.14
DC-05	9/27/2017	911.95	71.14	840.81
DC-05	12/3/2017	911.95	70.50	841.45
DC-05	3/18/2018	911.95	71.06	840.89
DC-05	6/3/2018	911.95	71.33	840.62
DC-05	9/8/2018	911.95	71.39	840.56
DC-05	12/9/2018	911.95	70.82	841.13
DC-05	3/21/2019	911.95	71.46	840.49
DC-05	6/1/2019	911.95	71.95	840.00
DC-05	9/8/2019	911.95	72.09	839.86
DC-05	12/8/2019	911.95	71.47	840.48
DC-05	3/29/2020	911.95	72.43	839.52
DC-05	6/7/2020	911.95	73.11	838.84
DC-05	9/20/2020	911.95	73.38	838.57
DC-05	12/6/2020	911.95	73.03	838.92
DC-05	2/28/2021	911.95	73.97	837.98
DC-05	6/6/2021	911.95	74.88	837.07
DC-05	9/20/2021	911.95	74.92	837.03
DC-05	12/14/2021	911.95	74.08	837.87
DC-05	3/14/2022	911.95	74.52	837.43
DC-05	6/5/2022	911.95	74.21	837.74
DC-05	9/12/2022	911.95	73.95	838.00
DC-05	12/5/2022	911.95	71.45	840.50
DC-05	3/5/2023	911.95	73.70	838.25
DC-05	6/4/2023	911.95	75.21	836.74
DC-05	9/10/2023	911.95	75.09	836.86
DC-05D	9/16/2013	915.91	71.92	843.99
DC-05D	12/9/2013	915.91	72.04	843.87
DC-05D	3/16/2014	915.91	73.83	842.08
DC-05D	6/1/2014	915.91	74.80	841.11
DC-05D	9/21/2014	915.91	73.78	842.13
DC-05D	12/14/2014	915.91	73.02	842.89
DC-05D	3/5/2015	915.91	73.66	842.25
DC-05D	6/15/2015	915.91	74.71	841.20
DC-05D	9/21/2015	915.91	74.38	841.53
DC-05D	12/13/2015	915.91	73.88	842.03
DC-05D	3/8/2016	915.91	74.70	841.21
DC-05D	6/19/2016	915.91	75.71	840.20
DC-05D	9/25/2016	915.91	75.40	840.51
DC-05D	12/11/2016	915.91	74.65	841.26
DC-05D	3/5/2017	915.91	74.96	840.95

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
DC-05D	6/4/2017	915.91	75.94	839.97
DC-05D	9/27/2017	915.91	75.47	840.44
DC-05D	12/3/2017	915.91	74.64	841.27
DC-05D	3/18/2018	915.91	75.43	840.48
DC-05D	6/3/2018	915.91	75.46	840.45
DC-05D	9/8/2018	915.91	75.54	840.37
DC-05D	12/9/2018	915.91	75.00	840.91
DC-05D	3/21/2019	915.91	75.30	840.61
DC-05D	6/1/2019	915.91	76.26	839.65
DC-05D	9/8/2019	915.91	76.17	839.74
DC-05D	12/8/2019	915.91	75.37	840.54
DC-05D	3/29/2020	915.91	76.38	839.53
DC-05D	6/7/2020	915.91	77.36	838.55
DC-05D	9/20/2020	915.91	77.85	838.06
DC-05D	12/6/2020	915.91	77.21	838.70
DC-05D	2/28/2021	915.91	78.68	837.23
DC-05D	6/6/2021	915.91	79.28	836.63
DC-05D	9/20/2021	915.91	79.44	836.47
DC-05D	12/14/2021	915.91	78.26	837.65
DC-05D	3/14/2022	915.91	78.28	837.63
DC-05D	6/5/2022	915.91	77.36	838.55
DC-05D	9/12/2022	915.91	76.52	839.39
DC-05D	12/5/2022	915.91	71.99	843.92
DC-05D	3/5/2023	915.91	77.39	838.52
DC-05D	6/4/2023	915.91	78.91	837.00
DC-05D	9/10/2023	915.91	78.65	837.26
DC-07	9/16/2013	889.29	44.76	844.53
DC-07	12/9/2013	889.29	44.15	845.14
DC-07	3/16/2014	889.29	44.76	844.53
DC-07	6/1/2014	889.29	35.12	---[1]
DC-07	9/21/2014	889.29	44.59	844.70
DC-07	12/14/2014	889.29	44.13	845.16
DC-07	3/5/2015	889.29	44.90	844.39
DC-07	6/15/2015	889.29	45.30	843.99
DC-07	9/21/2015	889.29	45.08	844.21
DC-07	12/13/2015	889.29	44.65	844.64
DC-07	3/8/2016	889.29	45.50	843.79
DC-07	6/19/2016	889.29	46.16	843.13
DC-07	9/25/2016	889.29	45.69	843.60
DC-07	12/11/2016	889.29	45.61	843.68
DC-07	3/5/2017	889.29	46.27	843.02
DC-07	6/4/2017	889.29	46.54	842.75
DC-07	9/27/2017	889.29	46.11	843.18
DC-07	12/3/2017	889.29	45.73	843.56

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
DC-07	3/18/2018	889.29	46.45	842.84
DC-07	6/3/2018	889.29	46.76	842.53
DC-07	9/8/2018	889.29	46.32	842.97
DC-07	12/9/2018	889.29	46.09	843.20
DC-07	3/21/2019	889.29	46.94	842.35
DC-07	6/1/2019	889.29	47.36	841.93
DC-07	9/8/2019	889.29	46.79	842.50
DC-07	12/8/2019	889.29	46.68	842.61
DC-07	3/29/2020	889.29	47.65	841.64
DC-07	6/7/2020	889.29	48.04	841.25
DC-07	7/13/2020	889.29	48.06	841.23
DC-07	9/20/2020	889.29	47.80	841.49
DC-07	12/6/2020	889.29	47.51	841.78
DC-07	2/28/2021	889.29	48.12	841.17
DC-07	6/6/2021	889.29	48.69	840.60
DC-07	9/20/2021	889.29	48.17	841.12
DC-07	12/14/2021	889.29	48.05	841.24
DC-07	3/14/2022	889.29	48.81	840.48
DC-07	6/5/2022	889.29	49.25	840.04
DC-07	9/12/2022	889.29	49.03	840.26
DC-07	12/5/2022	889.29	48.57	840.72
DC-07	3/5/2023	889.29	49.70	839.59
DC-07	6/4/2023	889.29	49.98	839.31
DC-07	9/10/2023	889.29	49.80	839.49
DC-09	9/16/2013	1048.60	147.16	901.44
DC-09	12/9/2013	1048.60	143.10	905.50
DC-09	3/16/2014	1048.60	139.81	908.79
DC-09	6/1/2014	1048.60	142.53	906.07
DC-09	9/21/2014	1048.60	143.67	904.93
DC-09	12/14/2014	1048.60	139.42	909.18
DC-09	3/5/2015	1048.60	137.83	910.77
DC-09	6/15/2015	1048.60	146.33	902.27
DC-09	9/21/2015	1048.60	151.28	897.32
DC-09	12/13/2015	1048.60	147.46	901.14
DC-09	3/8/2016	1048.60	146.70	901.90
DC-09	6/19/2016	1048.60	151.03	897.57
DC-09	9/25/2016	1048.60	151.98	896.62
DC-09	12/11/2016	1048.60	148.71	899.89
DC-09	3/5/2017	1048.60	146.24	902.36
DC-09	6/4/2017	1048.60	148.62	899.98
DC-09	9/27/2017	1048.60	151.56	897.04
DC-09	12/3/2017	1048.60	149.27	899.33
DC-09	3/18/2018	1048.60	146.19	902.41
DC-09	6/3/2018	1048.60	149.27	899.33

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
DC-09	9/8/2018	1048.60	151.66	896.94
DC-09	12/9/2018	1048.60	149.99	898.61
DC-09	3/21/2019	1048.60	148.87	899.73
DC-09	6/1/2019	1048.60	151.32	897.28
DC-09	9/8/2019	1048.60	155.69	892.91
DC-09	12/8/2019	1048.60	155.23	893.37
DC-09	3/29/2020	1048.60	156.53	892.07
DC-09	6/7/2020	1048.60	157.91	890.69
DC-09	9/20/2020	1048.60	161.02	887.58
DC-09	12/6/2020	1048.60	160.56	888.04
DC-09	2/28/2021	1048.60	159.29	889.31
DC-09	6/6/2021	1048.60	161.68	886.92
DC-09	9/20/2021	1048.60	164.74	883.86
DC-09	12/14/2021	1048.60	163.15	885.45
DC-09	3/14/2022	1048.60	162.89	885.71
DC-09	6/5/2022	1048.60	164.10	884.50
DC-09	9/12/2022	1048.60	166.79	881.81
DC-09	12/5/2022	1048.60	165.30	883.30
DC-09	3/5/2023	1048.60	163.17	885.43
DC-09	6/4/2023	1048.60	164.23	884.37
DC-09	9/10/2023	1048.60	166.75	881.85
DC-14	9/16/2013	1036.61	131.08	905.53
DC-14	12/9/2013	1036.61	131.10	905.51
DC-14	3/16/2014	1036.61	130.32	906.29
DC-14	6/1/2014	1036.61	130.02	906.59
DC-14	9/21/2014	1036.61	130.25	906.36
DC-14	12/14/2014	1036.61	137.91	---[1]
DC-14	3/5/2015	1036.61	129.51	907.10
DC-14	6/15/2015	1036.61	129.37	907.24
DC-14	9/21/2015	1036.61	130.28	906.33
DC-14	12/13/2015	1036.61	130.71	905.90
DC-14	3/8/2016	1036.61	131.26	905.35
DC-14	6/19/2016	1036.61	131.89	904.72
DC-14	9/25/2016	1036.61	132.76	903.85
DC-14	12/11/2016	1036.61	133.45	903.16
DC-14	3/5/2017	1036.61	133.81	902.80
DC-14	6/4/2017	1036.61	133.81	902.80
DC-14	9/27/2017	1036.61	134.16	902.45
DC-14	12/3/2017	1036.61	134.48	902.13
DC-14	3/18/2018	1036.61	133.83	902.78
DC-14	6/3/2018	1036.61	133.35	903.26
DC-14	9/8/2018	1036.61	133.67	902.94
DC-14	12/9/2018	1036.61	133.67	902.94
DC-14	3/21/2019	1036.61	133.24	903.37

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
DC-14	6/1/2019	1036.61	132.98	903.63
DC-14	9/8/2019	1036.61	133.72	902.89
DC-14	12/8/2019	1036.61	134.60	902.01
DC-14	3/29/2020	1036.61	135.10	901.51
DC-14	6/7/2020	1036.61	135.56	901.05
DC-14	9/20/2020	1036.61	136.54	900.07
DC-14	12/6/2020	1036.61	137.45	899.16
DC-14	2/28/2021	1036.61	138.02	898.59
DC-14	6/6/2021	1036.61	138.28	898.33
DC-14	9/20/2021	1036.61	139.06	897.55
DC-14	12/14/2021	1036.61	139.58	897.03
DC-14	3/14/2022	1036.61	139.27	897.34
DC-14	6/5/2022	1036.61	139.03	897.58
DC-14	9/12/2022	1036.61	139.70	896.91
DC-14	12/5/2022	1036.61	139.84	896.77
DC-14	3/5/2023	1036.61	139.67	896.94
DC-14	6/4/2023	1036.61	139.12	897.49
DC-14	9/10/2023	1036.61	139.35	897.26
YVD-02	9/16/2013	1288.97	24.21	1264.76
YVD-02	12/9/2013	1288.97	32.85	1256.12
YVD-02	3/16/2014	1288.97	34.45	1254.52
YVD-02	6/1/2014	1288.97	22.10	1266.87
YVD-02	9/21/2014	1288.97	26.14	1262.83
YVD-02	12/14/2014	1288.97	33.01	1255.96
YVD-02	3/5/2015	1288.97	34.42	1254.55
YVD-02	6/15/2015	1288.97	19.69	1269.28
YVD-02	9/21/2015	1288.97	25.36	1263.61
YVD-02	12/13/2015	1288.97	33.25	1255.72
YVD-02	3/8/2016	1288.97	33.93	1255.04
YVD-02	6/19/2016	1288.97	27.49	1261.48
YVD-02	9/25/2016	1288.97	27.72	1261.25
YVD-02	12/11/2016	1288.97	32.52	1256.45
YVD-02	3/5/2017	1288.97	27.34	1261.63
YVD-02	6/4/2017	1288.97	26.97	1262.00
YVD-02	9/27/2017	1288.97	28.08	1260.89
YVD-02	12/3/2017	1288.97	33.83	1255.14
YVD-02	3/18/2018	1288.97	34.07	1254.90
YVD-02	6/3/2018	1288.97	33.78	1255.19
YVD-02	9/8/2018	1288.97	29.19	1259.78
YVD-02	12/9/2018	1288.97	33.17	1255.8
YVD-02	3/21/2019	1288.97	34.44	1254.53
YVD-02	6/1/2019	1288.97	30.68	1258.29
YVD-02	9/8/2019	1288.97	32.34	1256.63
YVD-02	12/8/2019	1288.97	33.92	1255.05

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-02	3/29/2020	1288.97	35.49	1253.48
YVD-02	6/7/2020	1288.97	37.44	1251.53
YVD-02	7/13/2020	1288.97	37.68	1251.29
YVD-02	9/19/2020	1288.97	37.94	1251.03
YVD-02	12/6/2020	1288.97	Dry	---
YVD-02	2/28/2021	1288.97	37.93	1251.04
YVD-02	6/6/2021	1288.97	Dry	---
YVD-02	9/20/2021	1288.97	Dry	---
YVD-02	12/14/2021	1288.97	Dry	---
YVD-02	3/14/2022	1288.97	Dry	---
YVD-02	6/5/2022	1288.97	Dry	---
YVD-02	9/12/2022	1288.97	Dry	---
YVD-02	12/5/2022	1288.97	Dry	---
YVD-02	3/5/2023	1288.97	Dry	---
YVD-02	6/4/2023	1288.97	Dry	---
YVD-02	9/10/2023	1288.97	Dry	---
YVD-03	9/16/2013	1120.68	189.88	930.80
YVD-03	12/9/2013	1120.68	190.42	930.26
YVD-03	3/16/2014	1120.68	189.10	931.58
YVD-03	6/1/2014	1120.68	188.97	931.71
YVD-03	9/21/2014	1120.68	189.04	931.64
YVD-03	12/14/2014	1120.68	188.73	931.95
YVD-03	3/5/2015	1120.68	187.92	932.76
YVD-03	6/15/2015	1120.68	188.70	931.98
YVD-03	9/21/2015	1120.68	189.63	931.05
YVD-03	12/13/2015	1120.68	189.85	930.83
YVD-03	3/8/2016	1120.68	190.64	930.04
YVD-03	6/19/2016	1120.68	191.31	929.37
YVD-03	9/25/2016	1120.68	191.61	929.07
YVD-03	12/11/2016	1120.68	191.25	929.43
YVD-03	3/5/2017	1120.68	190.85	929.83
YVD-03	6/4/2017	1120.68	191.20	929.48
YVD-03	9/27/2017	1120.68	191.77	928.91
YVD-03	12/3/2017	1120.68	191.61	929.07
YVD-03	3/18/2018	1120.68	191.55	929.13
YVD-03	6/3/2018	1120.68	191.4	929.28
YVD-03	9/8/2018	1120.68	191.96	928.72
YVD-03	12/9/2018	1120.68	192.59	928.09
YVD-03	3/21/2019	1120.68	191.86	928.82
YVD-03	6/1/2019	1120.68	191.85	928.83
YVD-03	9/8/2019	1120.68	192.53	928.15
YVD-03	12/8/2019	1120.68	193.62	927.06
YVD-03	3/29/2020	1120.68	193.93	926.75
YVD-03	6/7/2020	1120.68	194.17	926.51

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-03	9/20/2020	1120.68	195.07	925.61
YVD-03	11/19/2020	1120.68	195.78	924.90
YVD-03	12/6/2020	1120.68	195.75	924.93
YVD-03	2/28/2021	1120.68	195.8	924.88
YVD-03	6/6/2021	1120.68	195.50	925.18
YVD-03	9/20/2021	1120.68	196.18	924.50
YVD-03	12/14/2021	1120.68	195.94	924.74
YVD-03	3/14/2022	1120.68	196.42	924.26
YVD-03	6/5/2022	1120.68	196.15	924.53
YVD-03	9/12/2022	1120.68	197.06	923.62
YVD-03	12/5/2022	1120.68	197.11	923.57
YVD-03	3/5/2023	1120.68	197.05	923.63
YVD-03	6/4/2023	1120.68	197.29	923.39
YVD-03	9/10/2023	1120.68	197.62	923.06
YVD-04	9/16/2013	1118.66	220.55	898.11
YVD-04	12/9/2013	1118.66	223.50	895.16
YVD-04	3/16/2014	1118.66	222.20	896.46
YVD-04	6/1/2014	1118.66	221.04	897.62
YVD-04	9/21/2014	1118.66	220.67	897.99
YVD-04	12/14/2014	1118.66	221.30	897.36
YVD-04	3/5/2015	1118.66	220.72	897.94
YVD-04	6/15/2015	1118.66	221.61	897.05
YVD-04	9/21/2015	1118.66	221.99	896.67
YVD-04	12/13/2015	1118.66	221.71	896.95
YVD-04	3/8/2016	1118.66	220.74	897.92
YVD-04	6/19/2016	1118.66	221.50	897.16
YVD-04	9/25/2016	1118.66	221.05	897.61
YVD-04	12/11/2016	1118.66	221.07	897.59
YVD-04	3/5/2017	1118.66	220.89	897.77
YVD-04	6/4/2017	1118.66	221.83	896.83
YVD-04	9/27/2017	1118.66	222.49	896.17
YVD-04	12/3/2017	1118.66	222.38	896.28
YVD-04	3/18/2018	1118.66	222.37	896.29
YVD-04	6/3/2018	1118.66	222.04	896.62
YVD-04	9/8/2018	1118.66	222.29	896.37
YVD-04	12/9/2018	1118.66	222.36	896.30
YVD-04	3/21/2019	1118.66	221.67	896.99
YVD-04	6/1/2019	1118.66	221.71	896.95
YVD-04	9/8/2019	1118.66	222.06	896.60
YVD-04	12/8/2019	1118.66	222.31	896.35
YVD-04	3/29/2020	1118.66	222.47	896.19
YVD-04	6/7/2020	1118.66	222.76	895.90
YVD-04	9/20/2020	1118.66	223.52	895.14
YVD-04	12/6/2020	1118.66	224.24	894.42

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-04	2/28/2021	1118.66	224.39	894.27
YVD-04	6/6/2021	1118.66	224.48	894.18
YVD-04	9/20/2021	1118.66	225.71	892.95
YVD-04	12/14/2021	1118.66	225.63	893.03
YVD-04	3/14/2022	1118.66	226.81	891.85
YVD-04	6/5/2022	1118.66	227.54	891.12
YVD-04	9/12/2022	1118.66	229.62	889.04
YVD-04	12/5/2022	1118.66	230.28	888.38
YVD-04	3/5/2023	1118.66	230.47	888.19
YVD-04	6/4/2023	1118.66	231.28	887.38
YVD-04	9/10/2023	1118.66	231.89	886.77
YVD-05	9/16/2013	1051.78	167.50	884.28
YVD-05	12/9/2013	1051.78	166.35	885.43
YVD-05	3/16/2014	1051.78	165.40	886.38
YVD-05	6/1/2014	1051.78	165.58	886.20
YVD-05	9/21/2014	1051.78	166.01	885.77
YVD-05	12/14/2014	1051.78	165.35	886.43
YVD-05	3/5/2015	1051.78	164.86	886.92
YVD-05	6/15/2015	1051.78	166.04	885.74
YVD-05	9/21/2015	1051.78	168.04	883.74
YVD-05	12/13/2015	1051.78	167.75	884.03
YVD-05	3/8/2016	1051.78	167.71	884.07
YVD-05	6/19/2016	1051.78	168.45	883.33
YVD-05	9/25/2016	1051.78	168.97	882.81
YVD-05	12/11/2016	1051.78	168.51	883.27
YVD-05	3/5/2017	1051.78	167.98	883.80
YVD-05	6/4/2017	1051.78	168.07	883.71
YVD-05	9/27/2017	1051.78	169.83	881.95
YVD-05	12/3/2017	1051.78	169.67	882.11
YVD-05	3/18/2018	1051.78	169.38	882.40
YVD-05	6/3/2018	1051.78	169.45	882.33
YVD-05	9/8/2018	1051.78	169.85	881.93
YVD-05	12/9/2018	1051.78	169.44	882.34
YVD-05	3/21/2019	1051.78	168.86	882.92
YVD-05	6/1/2019	1051.78	169.06	882.72
YVD-05	9/8/2019	1051.78	170.22	881.56
YVD-05	12/8/2019	1051.78	170.62	881.16
YVD-05	3/29/2020	1051.78	171.06	880.72
YVD-05	6/7/2020	1051.78	171.58	880.20
YVD-05	9/20/2020	1051.78	172.53	879.25
YVD-05	12/6/2020	1051.78	172.95	878.83
YVD-05	2/28/2021	1051.78	173.05	878.73
YVD-05	6/6/2021	1051.78	173.39	878.39
YVD-05	9/20/2021	1051.78	NM[2]	---

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-05	12/14/2021	1051.78	174.20	877.58
YVD-05	3/14/2022	1051.78	174.19	877.59
YVD-05	6/5/2022	1051.78	174.32	877.46
YVD-05	9/12/2022	1051.78	175.22	876.56
YVD-05	12/5/2022	1051.78	175.35	876.43
YVD-05	3/5/2023	1051.78	175.05	876.73
YVD-05	6/4/2023	1051.78	175.15	876.63
YVD-05	9/10/2023	1051.78	175.25	876.53
YVD-06	9/16/2013	1053.51	110.65	942.86
YVD-06	12/9/2013	1053.51	108.21	945.30
YVD-06	3/16/2014	1053.51	105.98	947.53
YVD-06	6/1/2014	1053.51	106.49	947.02
YVD-06	9/21/2014	1053.51	108.02	945.49
YVD-06	12/14/2014	1053.51	106.32	947.19
YVD-06	3/5/2015	1053.51	104.68	948.83
YVD-06	6/15/2015	1053.51	106.37	947.14
YVD-06	9/21/2015	1053.51	109.01	944.50
YVD-06	12/13/2015	1053.51	108.72	944.79
YVD-06	3/8/2016	1053.51	108.90	944.61
YVD-06	6/19/2016	1053.51	111.03	942.48
YVD-06	9/25/2016	1053.51	112.05	941.46
YVD-06	12/15/2016	1053.51	109.70	943.81
YVD-06	3/5/2017	1053.51	107.89	945.62
YVD-06	6/4/2017	1053.51	109.14	944.37
YVD-06	9/27/2017	1053.51	110.99	942.52
YVD-06	12/3/2017	1053.51	109.30	944.21
YVD-06	3/18/2018	1053.51	106.37	947.14
YVD-06	6/3/2018	1053.51	108.02	945.49
YVD-06	9/8/2018	1053.51	109.87	943.64
YVD-06	12/9/2018	1053.51	107.99	945.52
YVD-06	3/21/2019	1053.51	106.86	946.65
YVD-06	6/1/2019	1053.51	108.32	945.19
YVD-06	9/8/2019	1053.51	110.95	942.56
YVD-06	12/8/2019	1053.51	111.11	942.40
YVD-06	3/29/2020	1053.51	110.92	942.59
YVD-06	6/7/2020	1053.51	112.14	941.37
YVD-06	9/20/2020	1053.51	113.89	939.62
YVD-06	12/6/2020	1053.51	113.00	940.51
YVD-06	2/28/2021	1053.51	111.71	941.80
YVD-06	6/6/2021	1053.51	112.36	941.15
YVD-06	9/20/2021	1053.51	113.89	939.62
YVD-06	12/14/2021	1053.51	111.58	941.93
YVD-06	3/14/2022	1053.51	110.29	943.22
YVD-06	6/5/2022	1053.51	111.01	942.50

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-06	9/12/2022	1053.51	112.62	940.89
YVD-06	12/5/2022	1053.51	111.18	942.33
YVD-06	3/5/2023	1053.51	109.35	944.16
YVD-06	6/4/2023	1053.51	110.20	943.31
YVD-06	9/10/2023	1053.51	111.42	942.09
YVD-07	9/16/2013	1073.03	157.99	915.04
YVD-07	12/9/2013	1073.03	157.26	915.77
YVD-07	3/16/2014	1073.03	153.95	919.08
YVD-07	6/1/2014	1073.03	153.87	919.16
YVD-07	9/21/2014	1073.03	155.93	917.10
YVD-07	12/14/2014	1073.03	155.40	917.63
YVD-07	3/5/2015	1073.03	153.42	919.61
YVD-07	6/15/2015	1073.03	154.30	918.73
YVD-07	9/21/2015	1073.03	157.09	915.94
YVD-07	12/13/2015	1073.03	158.05	914.98
YVD-07	3/8/2016	1073.03	157.96	915.07
YVD-07	6/19/2016	1073.03	158.75	914.28
YVD-07	9/25/2016	1073.03	160.29	912.74
YVD-07	12/11/2016	1073.03	160.00	913.03
YVD-07	3/5/2017	1073.03	157.59	915.44
YVD-07	6/4/2017	1073.03	157.56	915.47
YVD-07	9/27/2017	1073.03	159.81	913.22
YVD-07	12/3/2017	1073.03	159.30	913.73
YVD-07	3/18/2018	1073.03	156.76	916.27
YVD-07	6/3/2018	1073.03	156.44	916.59
YVD-07	9/8/2018	1073.03	158.22	914.81
YVD-07	12/9/2018	1073.03	158.27	914.76
YVD-07	3/21/2019	1073.03	156.58	916.45
YVD-07	6/1/2019	1073.03	157.05	915.98
YVD-07	9/8/2019	1073.03	159.06	913.97
YVD-07	12/8/2019	1073.03	160.48	912.55
YVD-07	3/29/2020	1073.03	159.62	913.41
YVD-07	6/7/2020	1073.03	160.42	912.61
YVD-07	9/20/2020	1073.03	162.61	910.42
YVD-07	12/6/2020	1073.03	164.10	908.93
YVD-07	2/28/2021	1073.03	162.27	910.76
YVD-07	6/6/2021	1073.03	161.15	911.88
YVD-07	9/20/2021	1073.03	163.83	909.20
YVD-07	12/14/2021	1073.03	163.66	909.37
YVD-07	3/14/2022	1073.03	159.94	913.09
YVD-07	6/5/2022	1073.03	159.47	913.56
YVD-07	9/12/2022	1073.03	161.24	911.79
YVD-07	12/5/2022	1073.03	161.72	911.31
YVD-07	3/5/2023	1073.03	158.98	914.05

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-07	6/4/2023	1073.03	158.18	914.85
YVD-07	9/10/2023	1073.03	159.44	913.59
YVD-08	9/16/2013	1014.38	170.83	843.55
YVD-08	12/9/2013	1014.38	171.08	843.30
YVD-08	3/16/2014	1014.38	170.66	843.72
YVD-08	6/1/2014	1014.38	170.50	843.88
YVD-08	9/21/2014	1014.38	170.50	843.88
YVD-08	12/14/2014	1014.38	170.22	844.16
YVD-08	3/5/2015	1014.38	169.83	844.55
YVD-08	6/15/2015	1014.38	170.13	844.25
YVD-08	9/21/2015	1014.38	170.67	843.71
YVD-08	12/13/2015	1014.38	170.63	843.75
YVD-08	3/8/2016	1014.38	171.00	843.38
YVD-08	6/19/2016	1014.38	171.51	842.87
YVD-08	9/25/2016	1014.38	171.75	842.63
YVD-08	12/11/2016	1014.38	171.52	842.86
YVD-08	3/5/2017	1014.38	171.16	843.22
YVD-08	6/4/2017	1014.38	171.87	842.51
YVD-08	9/27/2017	1014.38	172.30	842.08
YVD-08	12/3/2017	1014.38	171.95	842.43
YVD-08	3/18/2018	1014.38	172.17	842.21
YVD-08	6/3/2018	1014.38	172.10	842.28
YVD-08	9/8/2018	1014.38	172.36	842.02
YVD-08	12/9/2018	1014.38	172.39	841.99
YVD-08	3/21/2019	1014.38	172.03	842.35
YVD-08	6/1/2019	1014.38	172.39	841.99
YVD-08	9/8/2019	1014.38	172.56	841.82
YVD-08	12/8/2019	1014.38	172.73	841.65
YVD-08	3/29/2020	1014.38	172.66	841.72
YVD-08	6/7/2020	1014.38	172.87	841.51
YVD-08	9/20/2020	1014.38	173.33	841.05
YVD-08	12/6/2020	1014.38	173.75	840.63
YVD-08	2/28/2021	1014.38	173.87	840.51
YVD-08	6/6/2021	1014.38	173.75	840.63
YVD-08	9/20/2021	1014.38	174.58	839.80
YVD-08	12/14/2021	1014.38	174.37	840.01
YVD-08	3/14/2022	1014.38	174.83	839.55
YVD-08	6/5/2022	1014.38	174.85	839.53
YVD-08	9/12/2022	1014.38	175.64	838.74
YVD-08	12/5/2022	1014.38	175.88	838.50
YVD-08	3/5/2023	1014.38	176.02	838.36
YVD-08	6/4/2023	1014.38	176.44	837.94
YVD-08	9/10/2023	1014.38	176.78	837.60

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-09	9/16/2013	966.81	111.14	855.67
YVD-09	12/9/2013	966.81	109.93	856.88
YVD-09	3/16/2014	966.81	109.65	857.16
YVD-09	6/1/2014	966.81	109.95	856.86
YVD-09	9/21/2014	966.81	110.08	856.73
YVD-09	12/14/2014	966.81	109.90	856.91
YVD-09	3/5/2015	966.81	109.95	856.86
YVD-09	6/15/2015	966.81	110.35	856.46
YVD-09	9/21/2015	966.81	110.83	855.98
YVD-09	12/13/2015	966.81	110.89	855.92
YVD-09	3/8/2016	966.81	111.16	855.65
YVD-09	6/19/2016	966.81	111.41	855.40
YVD-09	9/25/2016	966.81	111.68	855.13
YVD-09	12/11/2016	966.81	111.84	854.97
YVD-09	3/5/2017	966.81	111.92	854.89
YVD-09	6/4/2017	966.81	112.29	854.52
YVD-09	9/27/2017	966.81	112.50	854.31
YVD-09	12/3/2017	966.81	112.59	854.22
YVD-09	3/18/2018	966.81	112.56	854.25
YVD-09	6/3/2018	966.81	112.28	854.53
YVD-09	9/8/2018	966.81	112.19	854.62
YVD-09	12/9/2018	966.81	111.77	855.04
YVD-09	3/21/2019	966.81	111.78	855.03
YVD-09	6/1/2019	966.81	112.03	854.78
YVD-09	9/8/2019	966.81	112.37	854.44
YVD-09	12/8/2019	966.81	112.55	854.26
YVD-09	3/29/2020	966.81	112.60	854.21
YVD-09	6/7/2020	966.81	112.92	853.89
YVD-09	9/20/2020	966.81	113.29	853.52
YVD-09	12/6/2020	966.81	113.55	853.26
YVD-09	2/28/2021	966.81	113.63	853.18
YVD-09	6/6/2021	966.81	113.80	853.01
YVD-09	9/20/2021	966.81	114.41	852.40
YVD-09	12/14/2021	966.81	114.66	852.15
YVD-09	3/14/2022	966.81	114.54	852.27
YVD-09	6/5/2022	966.81	114.70	852.11
YVD-09	9/12/2022	966.81	115.22	851.59
YVD-09	12/5/2022	966.81	115.16	851.65
YVD-09	3/5/2023	966.81	115.21	851.60
YVD-09	6/4/2023	966.81	115.33	851.48
YVD-09	9/10/2023	966.81	115.56	851.25
YVD-10	9/16/2013	958.00	90.04	867.96
YVD-10	12/9/2013	958.00	89.20	868.80
YVD-10	3/16/2014	958.00	89.39	868.61

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-10	6/1/2014	958.00	90.35	867.65
YVD-10	9/21/2014	958.00	90.41	867.59
YVD-10	12/14/2014	958.00	88.76	869.24
YVD-10	3/5/2015	958.00	89.90	868.10
YVD-10	6/15/2015	958.00	91.10	866.90
YVD-10	9/21/2015	958.00	91.85	866.15
YVD-10	12/13/2015	958.00	91.52	866.48
YVD-10	3/8/2016	958.00	91.91	866.09
YVD-10	6/19/2016	958.00	92.92	865.08
YVD-10	9/25/2016	958.00	92.99	865.01
YVD-10	12/11/2016	958.00	93.02	864.98
YVD-10	3/5/2017	958.00	93.24	864.76
YVD-10	6/4/2017	958.00	93.70	864.30
YVD-10	9/27/2017	958.00	93.39	864.61
YVD-10	12/3/2017	958.00	92.86	865.14
YVD-10	3/18/2018	958.00	92.49	865.51
YVD-10	6/3/2018	958.00	92.81	865.19
YVD-10	9/8/2018	958.00	93.35	864.65
YVD-10	12/9/2018	958.00	92.50	865.50
YVD-10	3/21/2019	958.00	92.36	865.64
YVD-10	6/1/2019	958.00	93.03	864.97
YVD-10	9/8/2019	958.00	93.67	864.33
YVD-10	12/8/2019	958.00	93.44	864.56
YVD-10	3/29/2020	958.00	94.06	863.94
YVD-10	6/7/2020	958.00	94.38	863.62
YVD-10	9/20/2020	958.00	94.92	863.08
YVD-10	12/6/2020	958.00	94.39	863.61
YVD-10	2/28/2021	958.00	94.67	863.33
YVD-10	6/6/2021	958.00	95.54	862.46
YVD-10	9/20/2021	958.00	95.88	862.12
YVD-10	12/14/2021	958.00	95.35	862.65
YVD-10	3/14/2022	958.00	95.06	862.94
YVD-10	6/5/2022	958.00	95.62	862.38
YVD-10	9/12/2022	958.00	96.37	861.63
YVD-10	12/5/2022	958.00	95.42	862.58
YVD-10	3/5/2023	958.00	95.26	862.74
YVD-10	6/4/2023	958.00	95.84	862.16
YVD-10	9/10/2023	958.00	96.20	861.80
YVD-11	9/16/2013	967.91	106.03	861.88
YVD-11	12/9/2013	967.91	105.77	862.14
YVD-11	3/16/2014	967.91	105.72	862.19
YVD-11	6/1/2014	967.91	106.07	861.84
YVD-11	9/21/2014	967.91	106.04	861.87
YVD-11	12/14/2014	967.91	106.08	861.83

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-11	3/5/2015	967.91	106.18	861.73
YVD-11	6/15/2015	967.91	106.67	861.24
YVD-11	9/21/2015	967.91	106.52	861.39
YVD-11	12/13/2015	967.91	106.88	861.03
YVD-11	3/8/2016	967.91	107.58	860.33
YVD-11	6/19/2016	967.91	108.52	859.39
YVD-11	9/25/2016	967.91	108.95	858.96
YVD-11	12/11/2016	967.91	108.90	859.01
YVD-11	3/5/2017	967.91	109.08	858.83
YVD-11	6/4/2017	967.91	109.31	858.60
YVD-11	9/27/2017	967.91	108.75	859.16
YVD-11	12/3/2017	967.91	107.73	860.18
YVD-11	3/18/2018	967.91	108.10	859.81
YVD-11	6/3/2018	967.91	108.63	859.28
YVD-11	9/8/2018	967.91	108.97	858.94
YVD-11	12/9/2018	967.91	108.16	859.75
YVD-11	3/21/2019	967.91	108.58	859.33
YVD-11	6/1/2019	967.91	109.00	858.91
YVD-11	9/8/2019	967.91	109.58	858.33
YVD-11	12/8/2019	967.91	109.63	858.28
YVD-11	3/29/2020	967.91	110.09	857.82
YVD-11	6/7/2020	967.91	110.52	857.39
YVD-11	9/20/2020	967.91	111.12	856.79
YVD-11	12/6/2020	967.91	111.12	856.79
YVD-11	2/28/2021	967.91	111.24	856.67
YVD-11	6/6/2021	967.91	111.79	856.12
YVD-11	9/20/2021	967.91	111.94	855.97
YVD-11	12/14/2021	967.91	111.87	856.04
YVD-11	3/14/2022	967.91	112.00	855.91
YVD-11	6/5/2022	967.91	112.49	855.42
YVD-11	9/12/2022	967.91	111.92	855.99
YVD-11	12/5/2022	967.91	111.28	856.63
YVD-11	3/5/2023	967.91	111.52	856.39
YVD-11	6/4/2023	967.91	112.17	855.74
YVD-11	9/10/2023	967.91	112.18	855.73
YVD-12	9/16/2013	961.91	138.50	823.41
YVD-12	12/9/2013	961.91	138.34	823.57
YVD-12	3/16/2014	961.91	137.55	824.36
YVD-12	6/1/2014	961.91	137.61	824.30
YVD-12	9/21/2014	961.91	137.45	824.46
YVD-12	12/14/2014	961.91	137.25	824.66
YVD-12	3/5/2015	961.91	136.52	825.39
YVD-12	6/15/2015	961.91	137.85	824.06
YVD-12	9/21/2015	961.91	138.95	822.96

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-12	12/13/2015	961.91	138.11	823.80
YVD-12	3/8/2016	961.91	138.26	823.65
YVD-12	6/19/2016	961.91	139.23	822.68
YVD-12	9/25/2016	961.91	139.13	822.78
YVD-12	12/11/2016	961.91	138.56	823.35
YVD-12	3/5/2017	961.91	138.02	823.89
YVD-12	6/4/2017	961.91	138.90	823.01
YVD-12	9/27/2017	961.91	139.05	822.86
YVD-12	12/3/2017	961.91	138.48	823.43
YVD-12	3/18/2018	961.91	138.46	823.45
YVD-12	6/3/2018	961.91	138.75	823.16
YVD-12	9/8/2018	961.91	139.15	822.76
YVD-12	12/9/2018	961.91	139.14	822.77
YVD-12	3/21/2019	961.91	138.69	823.22
YVD-12	6/1/2019	961.91	139.27	822.64
YVD-12	9/8/2019	961.91	139.67	822.24
YVD-12	12/8/2019	961.91	139.51	822.40
YVD-12	3/29/2020	961.91	139.82	822.09
YVD-12	6/7/2020	961.91	140.11	821.80
YVD-12	9/20/2020	961.91	140.51	821.40
YVD-12	12/6/2020	961.91	140.48	821.43
YVD-12	2/28/2021	961.91	140.39	821.52
YVD-12	6/6/2021	961.91	140.70	821.21
YVD-12	9/20/2021	961.91	141.51	820.40
YVD-12	12/14/2021	961.91	140.81	821.10
YVD-12	3/14/2022	961.91	141.28	820.63
YVD-12	6/5/2022	961.91	141.39	820.52
YVD-12	9/12/2022	961.91	142.17	819.74
YVD-12	12/5/2022	961.91	141.88	820.03
YVD-12	3/5/2023	961.91	141.76	820.15
YVD-12	6/4/2023	961.91	142.38	819.53
YVD-12	9/10/2023	961.91	142.72	819.19
YVD-13	9/16/2013	965.59	127.43	838.16
YVD-13	12/9/2013	965.59	127.25	838.34
YVD-13	3/16/2014	965.59	127.58	838.01
YVD-13	6/1/2014	965.59	127.59	838.00
YVD-13	9/21/2014	965.59	127.29	838.30
YVD-13	12/14/2014	965.59	127.20	838.39
YVD-13	3/5/2015	965.59	127.35	838.24
YVD-13	6/15/2015	965.59	127.60	837.99
YVD-13	9/21/2015	965.59	127.36	838.23
YVD-13	12/13/2015	965.59	127.13	838.46
YVD-13	3/8/2016	965.59	127.87	837.72
YVD-13	6/19/2016	965.59	128.17	837.42

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-13	9/25/2016	965.59	127.88	837.71
YVD-13	12/11/2016	965.59	127.57	838.02
YVD-13	3/5/2017	965.59	127.92	837.67
YVD-13	6/4/2017	965.59	128.49	837.10
YVD-13	9/27/2017	965.59	128.05	837.54
YVD-13	12/3/2017	965.59	127.88	837.71
YVD-13	3/18/2018	965.59	128.47	837.12
YVD-13	6/3/2018	965.59	128.44	837.15
YVD-13	9/8/2018	965.59	128.28	837.31
YVD-13	12/9/2018	965.59	127.87	837.72
YVD-13	3/21/2019	965.59	128.46	837.13
YVD-13	6/1/2019	965.59	128.88	836.71
YVD-13	9/8/2019	965.59	128.62	836.97
YVD-13	12/8/2019	965.59	128.51	837.08
YVD-13	3/29/2020	965.59	129.09	836.50
YVD-13	6/7/2020	965.59	129.53	836.06
YVD-13	9/20/2020	965.59	129.32	836.27
YVD-13	12/6/2020	965.59	129.18	836.41
YVD-13	2/28/2021	965.59	129.66	835.93
YVD-13	6/6/2021	965.59	129.99	835.60
YVD-13	9/20/2021	965.59	130.05	835.54
YVD-13	12/14/2021	965.59	129.81	835.78
YVD-13	3/14/2022	965.59	130.36	835.23
YVD-13	6/5/2022	965.59	130.57	835.02
YVD-13	9/12/2022	965.59	130.70	834.89
YVD-13	12/5/2022	965.59	130.43	835.16
YVD-13	3/5/2023	965.59	131.16	834.43
YVD-13	6/4/2023	965.59	131.70	833.89
YVD-13	9/10/2023	965.59	131.62	833.97
YVD-14	9/16/2013	920.19	77.30	842.89
YVD-14	12/9/2013	920.19	76.97	843.22
YVD-14	3/16/2014	920.19	77.45	842.74
YVD-14	6/1/2014	920.19	77.61	842.58
YVD-14	9/21/2014	920.19	77.28	842.91
YVD-14	12/14/2014	920.19	76.90	843.29
YVD-14	3/5/2015	920.19	77.51	842.68
YVD-14	6/17/2015	---	NM[3]	---
YVD-14	9/21/2015	---	NM[3]	---
YVD-14R	12/13/2015	921.41	77.76	843.65
YVD-14R	3/8/2016	921.41	78.53	842.88
YVD-14R	6/19/2016	921.41	79.03	842.38
YVD-14R	9/25/2016	921.41	78.68	842.73
YVD-14R	12/11/2016	921.41	78.57	842.84
YVD-14R	3/5/2017	921.41	79.14	842.27

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-14R	6/4/2017	921.41	79.53	841.88
YVD-14R	9/27/2017	921.41	78.93	842.48
YVD-14R	12/3/2017	921.41	78.72	842.69
YVD-14R	3/18/2018	921.41	79.40	842.01
YVD-14R	6/3/2018	921.41	79.35	842.06
YVD-14R	9/8/2018	921.41	79.26	842.15
YVD-14R	12/9/2018	921.41	78.93	842.48
YVD-14R	3/21/2019	921.41	79.75	841.66
YVD-14R	6/1/2019	921.41	80.14	841.27
YVD-14R	9/8/2019	921.41	79.74	841.67
YVD-14R	12/8/2019	921.41	79.60	841.81
YVD-14R	3/29/2020	921.41	80.46	840.95
YVD-14R	6/7/2020	921.41	80.83	840.58
YVD-14R	9/20/2020	921.41	80.55	840.86
YVD-14R	12/6/2020	921.41	80.38	841.03
YVD-14R	2/28/2021	921.41	80.92	840.49
YVD-14R	6/6/2021	921.41	81.41	840.00
YVD-14R	9/20/2021	921.41	81.13	840.28
YVD-14R	12/14/2021	921.41	80.95	840.46
YVD-14R	3/14/2022	921.41	81.65	839.76
YVD-14R	6/5/2022	921.41	82.01	839.40
YVD-14R	9/12/2022	921.41	81.91	839.50
YVD-14R	12/5/2022	921.41	81.58	839.83
YVD-14R	3/5/2023	921.41	82.37	839.04
YVD-14R	6/4/2023	921.41	82.86	838.55
YVD-14R	9/10/2023	921.41	82.65	838.76
YVD-15	9/16/2013	940.61	90.34	850.27
YVD-15	12/9/2013	940.61	90.49	850.12
YVD-15	3/16/2014	940.61	91.62	848.99
YVD-15	6/1/2014	940.61	92.57	848.04
YVD-15	9/21/2014	940.61	88.84	851.77
YVD-15	12/14/2014	940.61	90.56	850.05
YVD-15	3/5/2015	940.61	92.03	848.58
YVD-15	6/15/2015	940.61	93.22	847.39
YVD-15	9/21/2015	940.61	93.43	847.18
YVD-15	12/13/2015	940.61	93.21	847.40
YVD-15	3/8/2016	940.61	93.83	846.78
YVD-15	6/19/2016	940.61	94.70	845.91
YVD-15	9/25/2016	940.61	94.70	845.91
YVD-15	12/11/2016	940.61	94.44	846.17
YVD-15	3/5/2017	940.61	94.96	845.65
YVD-15	6/4/2017	940.61	95.52	845.09
YVD-15	9/27/2017	940.61	95.16	845.45
YVD-15	12/3/2017	940.61	94.74	845.87

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-15	3/18/2018	940.61	94.96	845.65
YVD-15	6/3/2018	940.61	95.32	845.29
YVD-15	9/8/2018	940.61	95.32	845.29
YVD-15	12/9/2018	940.61	94.79	845.82
YVD-15	3/21/2019	940.61	95.36	845.25
YVD-15	6/1/2019	940.61	95.83	844.78
YVD-15	9/8/2019	940.61	95.92	844.69
YVD-15	12/8/2019	940.61	95.55	845.06
YVD-15	3/29/2020	940.61	96.14	844.47
YVD-15	6/7/2020	940.61	96.58	844.03
YVD-15	9/20/2020	940.61	96.50	844.11
YVD-15	12/6/2020	940.61	95.96	844.65
YVD-15	2/28/2021	940.61	96.25	844.36
YVD-15	6/6/2021	940.61	96.97	843.64
YVD-15	9/20/2021	940.61	97.05	843.56
YVD-15	12/14/2021	940.61	96.53	844.08
YVD-15	3/14/2022	940.61	96.95	843.66
YVD-15	6/5/2022	940.61	97.51	843.10
YVD-15	9/12/2022	940.61	97.74	842.87
YVD-15	12/5/2022	940.61	96.95	843.66
YVD-15	3/5/2023	940.61	97.42	843.19
YVD-15	6/4/2023	940.61	98.05	842.56
YVD-15	9/10/2023	940.61	98.11	842.50
YVD-16	9/16/2013	975.90	112.95	862.95
YVD-16	12/9/2013	975.90	112.84	863.06
YVD-16	3/16/2014	975.90	112.50	863.40
YVD-16	6/1/2014	975.90	112.62	863.28
YVD-16	9/21/2014	975.90	113.02	862.88
YVD-16	12/14/2014	975.90	112.86	863.04
YVD-16	3/5/2015	975.90	112.42	863.48
YVD-16	6/15/2015	975.90	112.85	863.05
YVD-16	9/21/2015	975.90	113.95	861.95
YVD-16	12/13/2015	975.90	114.04	861.86
YVD-16	3/8/2016	975.90	114.51	861.39
YVD-16	6/19/2016	975.90	115.18	860.72
YVD-16	9/25/2016	975.90	115.67	860.23
YVD-16	12/11/2016	975.90	115.17	860.73
YVD-16	3/5/2017	975.90	114.90	861.00
YVD-16	6/4/2017	975.90	115.51	860.39
YVD-16	9/27/2017	975.90	115.32	860.58
YVD-16	12/3/2017	975.90	114.86	861.04
YVD-16	3/18/2018	975.90	114.49	861.41
YVD-16	6/3/2018	975.90	114.62	861.28
YVD-16	9/8/2018	975.90	115.77	860.13

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-16	12/9/2018	975.90	115.57	860.33
YVD-16	3/21/2019	975.90	115.14	860.76
YVD-16	6/1/2019	975.90	115.72	860.18
YVD-16	9/8/2019	975.90	116.43	859.47
YVD-16	12/8/2019	975.90	116.71	859.19
YVD-16	3/29/2020	975.90	116.83	859.07
YVD-16	6/7/2020	975.90	117.34	858.56
YVD-16	9/20/2020	975.90	118.44	857.46
YVD-16	12/6/2020	975.90	118.68	857.22
YVD-16	2/28/2021	975.90	118.70	857.20
YVD-16	6/6/2021	975.90	118.88	857.02
YVD-16	9/20/2021	975.90	119.54	856.36
YVD-16	12/14/2021	975.90	119.34	856.56
YVD-16	3/14/2022	975.90	119.54	856.36
YVD-16	6/5/2022	975.90	119.79	856.11
YVD-16	9/12/2022	975.90	120.60	855.30
YVD-16	12/5/2022	975.90	120.48	855.42
YVD-16	3/5/2023	975.90	119.91	855.99
YVD-16	6/4/2023	975.90	120.48	855.42
YVD-16	9/10/2023	975.90	121.05	854.85
YVD-17	9/16/2013	866.73	32.07	834.66
YVD-17	12/9/2013	866.73	34.81	831.92
YVD-17	3/16/2014	866.73	37.97	828.76
YVD-17	6/1/2014	866.73	35.50	831.23
YVD-17	9/21/2014	866.73	31.86	834.87
YVD-17	12/14/2014	866.73	34.74	831.99
YVD-17	3/5/2015	866.73	37.79	828.94
YVD-17	6/15/2015	866.73	34.57	832.16
YVD-17	9/21/2015	866.73	31.92	834.81
YVD-17	12/13/2015	866.73	35.16	831.57
YVD-17	3/8/2016	866.73	37.47	829.26
YVD-17	6/19/2016	866.73	35.37	831.36
YVD-17	9/25/2016	866.73	32.31	834.42
YVD-17	12/11/2016	866.73	35.20	831.53
YVD-17	3/5/2017	866.73	37.88	828.85
YVD-17	6/4/2017	866.73	36.13	830.60
YVD-17	9/27/2017	866.73	31.22	835.51
YVD-17	12/3/2017	866.73	34.65	832.08
YVD-17	3/18/2018	866.73	38.54	828.19
YVD-17	6/3/2018	866.73	36.20	830.53
YVD-17	9/8/2018	866.73	32.64	834.09
YVD-17	12/9/2018	866.73	35.42	831.31
YVD-17	3/21/2019	866.73	39.08	827.65
YVD-17	6/1/2019	866.73	37.30	829.43

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-17	9/9/2019	866.73	32.69	834.04
YVD-17	12/8/2019	866.73	35.95	830.78
YVD-17	3/29/2020	866.73	39.61	827.12
YVD-17	6/7/2020	866.73	36.93	829.80
YVD-17	9/20/2020	866.73	33.68	833.05
YVD-17	12/6/2020	866.73	36.31	830.42
YVD-17	2/28/2021	866.73	39.80	826.93
YVD-17	6/6/2021	866.73	37.82	828.91
YVD-17	9/20/2021	866.73	34.26	832.47
YVD-17	12/14/2021	866.73	37.37	829.36
YVD-17	3/14/2022	866.73	40.62	826.11
YVD-17	6/5/2022	866.73	38.57	828.16
YVD-17	9/12/2022	866.73	34.72	832.01
YVD-17	12/5/2022	866.73	37.42	829.31
YVD-17	3/5/2023	866.73	41.06	825.67
YVD-17	6/4/2023	866.73	39.70	827.03
YVD-17	9/10/2023	866.73	35.18	831.55
YVD-18	9/16/2013	965.74	127.49	838.25
YVD-18	12/9/2013	965.74	127.45	838.29
YVD-18	3/16/2014	965.74	127.75	837.99
YVD-18	6/1/2014	965.74	127.69	838.05
YVD-18	9/21/2014	965.74	127.33	838.41
YVD-18	12/14/2014	965.74	127.33	838.41
YVD-18	3/5/2015	965.74	127.46	838.28
YVD-18	6/15/2015	965.74	127.71	838.03
YVD-18	9/21/2015	965.74	127.42	838.32
YVD-18	12/13/2015	965.74	127.24	838.50
YVD-18	3/8/2016	965.74	128.05	837.69
YVD-18	6/19/2016	965.74	128.29	837.45
YVD-18	9/25/2016	965.74	127.92	837.82
YVD-18	12/11/2016	965.74	127.66	838.08
YVD-18	3/5/2017	965.74	128.01	837.73
YVD-18	6/4/2017	965.74	128.54	837.20
YVD-18	9/27/2017	965.74	128.14	837.60
YVD-18	12/3/2017	965.74	127.95	837.79
YVD-18	3/18/2018	965.74	128.72	837.02
YVD-18	6/3/2018	965.74	128.48	837.26
YVD-18	9/8/2018	965.74	128.35	837.39
YVD-18	12/9/2018	965.74	128.00	837.74
YVD-18	3/21/2019	965.74	128.62	837.12
YVD-18	6/1/2019	965.74	129.04	836.70
YVD-18	9/8/2019	965.74	128.71	837.03
YVD-18	12/8/2019	965.74	128.63	837.11
YVD-18	3/29/2020	965.74	129.29	836.45

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-18	6/7/2020	965.74	129.67	836.07
YVD-18	9/20/2020	965.74	129.41	836.33
YVD-18	12/6/2020	965.74	129.32	836.42
YVD-18	2/28/2021	965.74	129.90	835.84
YVD-18	6/6/2021	965.74	130.11	835.63
YVD-18	9/20/2021	965.74	130.20	835.54
YVD-18	12/14/2021	965.74	129.97	835.77
YVD-18	3/14/2022	965.74	130.62	835.12
YVD-18	6/5/2022	965.74	130.74	835.00
YVD-18	9/12/2022	965.74	130.84	834.90
YVD-18	12/5/2022	965.74	130.56	835.18
YVD-18	3/5/2023	965.74	131.40	834.34
YVD-18	6/4/2023	965.74	131.89	833.85
YVD-18	9/10/2023	965.74	131.73	834.01

Notes:
1. Anomalous water level measurement; omitted from dataset.
2. YVD-05 was covered with snow and ice and could not be located.
3. No well existed. YVD-14 was damaged and decommissioned during this time. YVD-14R installed as a replacement.
---: no value or not applicable
BTOC: below top of casing
NAVD88: North American Vertical Datum of 1988

Table 5
Estimated Possible Average Linear Groundwater Flow Velocities – Third Quarter 2023

Material	Hydraulic Conductivity[1,2] [K] (feet per day)	Effective Porosity[3] [n_e]	K/n_e	Estimated Possible Average Linear Groundwater Flow Velocities [V_X] (feet per day)			
				Third Quarter 2023 Hydraulic Gradients			
				Site Average I[4]	Upslope I	Central I	Southern I
				0.013	*0.026*	*0.011*	*0.004*
Fine sand	53	0.33	161	2.0	4.2	1.7	0.7
Medium sand to fine gravel	131	0.32	409	5.2	10.6	4.4	1.8
Medium sand to coarse gravel	164	0.30	547	6.9	14.2	5.8	2.4
Fine gravel	267	0.28	954	12.0	24.7	10.2	4.2

Notes:

1. Hydraulic conductivities obtained from U.S. Environmental Protection Agency Method 9100, Saturated Hydraulic Conductivity, Saturated Leachate Conductivity, and Intrinsic Permeability, Chapter 6 – Properties; Publication SW-846: *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* ; 1986.
2. Hydraulic conductivities presented are for well-sorted (poorly graded) material.
3. Effective porosity obtained from *Data Collection Handbook to Support Modeling Impacts of Radioactive Material in Soil* ; Environmental Assessment and Information Sciences Division, Argonne National Laboratory; Argonne, Illinois; April 1993.
4. Hydraulic gradient [I] in feet per foot.

Table 6
Field Parameter Measurements – Third Quarter 2023

Well ID	Measurement Date	Bladder Pump Type (portable or dedicated)	Purge Time (minutes)	Volume Purged (liters)	Temperature (°C)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH (Standard Units)	Oxidation/Reduction Potential (mV)	Turbidity (NTU)
DC-03	9/10/2023	Dedicated	18	5.5	14.7	6.38	2445	6.90	176.1	0.47
DC-03D	9/10/2023	Dedicated	24	6.0	15.0	1.59	1376	6.83	183.1	0.21
DC-04	9/11/2023	Dedicated	21	7.4	13.9	8.40	1337	7.16	167.7	0.54
DC-05	9/11/2023	Dedicated	21	3.5	15.5	7.14	1271	7.27	185.0	1.68
DC-05D	9/11/2023	Dedicated	21	5.9	14.7	9.50	673	7.74	164.0	0.41
DC-07	9/11/2023	Dedicated	18	3.1	15.2	0.65	1219	6.76	182.1	0.70
DC-14	9/11/2023	Dedicated	21	3.7	15.4	2.38	1797	6.60	197.2	0.20
YVD-02[1]	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
YVD-08	9/10/2023	Dedicated	21	1.0	21.3	5.11	1594	7.57	248.3	16.0
YVD-09	9/11/2023	Dedicated	15	2.0	16.2	5.47	1512	7.25	250.4	4.61
YVD-10	9/10/2023	Dedicated	18	2.8	14.5	6.00	2386	7.46	249.6	8.03
YVD-11	9/11/2023	Dedicated	21	1.9	15.5	6.37	2103	6.91	243.7	9.69
YVD-12	9/11/2023	Dedicated	18	1.5	18.0	6.53	1064	7.48	144.3	6.07
YVD-13	9/11/2023	Dedicated	18	2.6	17.3	7.23	1238	7.63	84.9	8.35
YVD-14R	9/11/2023	Dedicated	18	5.3	14.5	2.10	2417	6.77	208.8	0.29
YVD-15	9/11/2023	Dedicated	21	5.6	14.2	7.00	981	7.33	179.1	0.40
YVD-16	9/11/2023	Dedicated	30	1.7	18.9	8.52	942	7.47	190.0	20.9
YVD-18	9/11/2023	Dedicated	18	2.9	16.7	10.64	972	7.69	34.6	5.23

Notes:

1. Well dry during entire monitoring event.

°C: degrees Celsius

µS/cm: microsiemens per centimeter

mg/L: milligrams per liter

mV: millivolt

NS: not sampled

NTU: nephelometric turbidity unit

Table 7
Groundwater Analytical Results – Third Quarter 2023

				Analyte	Nitrate as Nitrogen		
				Analytical Method	EPA 300.0		
Well ID	Sample ID	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code
DC-03	YVD-091023-06	9/10/2023	N	K2310138	**139**	J	HTQ
DC-03D	YVD-091023-04	9/10/2023	N	K2310138	**36.7**	J	HTQ
DC-04	YVD-091123-22	9/11/2023	N	K2310209	**24.9**	J	HTQ
DC-05	YVD-091123-16	9/11/2023	N	K2310138	**41.5**	--	--
DC-05D	YVD-091123-18	9/11/2023	N	K2310209	**11.4**	J	HTQ
DC-07	YVD-091123-14	9/11/2023	N	K2310138	**4.40**	--	--
DC-14	YVD-091123-10	9/11/2023	N	K2310138	**49.9**	--	--
YVD-02	NS[1]	--	--	--	--	--	--
YVD-08	YVD-091023-01	9/10/2023	N	K2310138	**76.9**	J	HTQ
YVD-09	YVD-091123-07	9/11/2023	N	K2310138	**65.7**	--	--
YVD-09	YVD-091123-09	9/11/2023	FD	K2310138	**65.6**	--	--
YVD-10	YVD-091023-03	9/10/2023	N	K2310138	**70.3**	J	HTQ
YVD-10	YVD-091023-05	9/10/2023	FD	K2310138	**70.4**	J	HTQ
YVD-11	YVD-091123-11	9/11/2023	N	K2310138	**104**	--	--
YVD-12	YVD-091123-19	9/11/2023	N	K2310138	**15.7**	--	--
YVD-13	YVD-091123-21	9/11/2023	N	K2310209	**36.1**	J	HTQ
YVD-14R	YVD-091123-12	9/11/2023	N	K2310138	**114**	--	--
YVD-15	YVD-091123-20	9/11/2023	N	K2310209	**13.0**	J	HTQ
YVD-16	YVD-091123-17	9/11/2023	N	K2310138	**25.3**	--	--
YVD-18	YVD-091123-23	9/11/2023	N	K2310209	**28.4**	J	HTQ

Notes:
1. Well YVD-02 was dry. No sample could be collected.
Bold: detected result
--: not applicable
(as N): reported as nitrogen
EPA: U.S. Environmental Protection Agency
FD: field duplicate
HTQ: A dilution and reanalysis of this sample were conducted. The reanalysis was conducted outside of the designated holding time.
J: The compound was positively identified; however, the associated numerical value is an estimated concentration.
mg/L: milligrams per liter
N: normal sample
NS: not sampled

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-01	DC-01-130104	01/04/2013	N	EPA01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**9.80**	--	--
DC-01	DC-01-130924	09/24/2013	N	SWI0178	**110**	--	--	**110**	--	--	--	--	--	0.100	U	--	**88.9**	--	--	**44.0**	--	--	0.500	U	--	**32.5**	--	--	--	--	--	**11.1**	--	--
DC-01	DC-01-131211	12/11/2013	N	SWL0063	**159**	--	--	**160**	--	--	--	--	--	--	R	MSD	**91.4**	--	--	**47.8**	--	--	5.00	U	--	**32.6**	--	--	--	--	--	**11.5**	--	--
DC-01	DC-01-140318	03/18/2014	N	SXC0095	**159**	--	--	**160**	--	--	--	--	--	**0.101**	--	--	**90.5**	--	--	**48.2**	--	--	5.00	U	--	**31.4**	--	--	--	--	--	**11.2**	--	--
DC-01	DC-01-140602	06/02/2014	N	SXF0017	**164**	--	--	**165**	--	--	--	--	--	0.100	U	--	**88.6**	--	--	**41.4**	--	--	2.00	U	--	**31.9**	--	--	--	--	--	**9.76**	--	--
DC-01	DC-01-140923	09/23/2014	N	SXI0158	**154**	--	--	**155**	--	--	--	--	--	--	R	MSD	**89.4**	--	--	**41.8**	--	--	5.00	U	--	**31.2**	--	--	--	--	--	**9.00**	--	--
DC-01	DC-01-141216	12/16/2014	N	SXL0121	**140**	--	--	**140**	--	--	--	--	--	0.100	U	--	**92.8**	--	--	**85.7**	--	--	5.00	U	--	**34.0**	--	--	--	--	--	**18.9**	--	--
DC-01	DC-01-150316	03/16/2015	N	5904471	**150**	--	--	**150**	--	--	--	--	--	0.100	U	--	**91.0**	--	--	**44.0**	--	--	5.00	U	--	**32.0**	--	--	--	--	--	**11.0**	--	--
DC-01	DC-01-150616	06/16/2015	N	59010751	**150**	--	--	**150**	--	--	--	--	--	0.100	U	--	**91.0**	J+	MSD	**42.0**	--	--	5.00	U	--	**33.0**	J+	MSD	--	--	--	**9.50**	--	--
DC-01	DC-01-150923	09/23/2015	N	59020281	**150**	--	--	**150**	--	--	--	--	--	**0.130**	--	--	**83.0**	--	--	**37.0**	--	--	5.00	U	--	**32.0**	--	--	--	--	--	**8.60**	--	--
DC-01	YVD-D1-150923	09/23/2015	FD	59020281	**160**	--	--	**160**	--	--	--	--	--	0.100	U	--	**85.0**	--	--	**43.0**	--	--	0.500	U	--	**33.0**	--	--	--	--	--	**10.0**	--	--
DC-01	DC-01-151214	12/14/2015	N	59025431	**170**	J	FDP	**170**	J	FDP	--	--	--	--	R	MSD	**97.0**	--	--	**38.0**	--	--	5.00	U	--	**34.0**	--	--	--	--	--	**8.80**	--	--
DC-01	DC-01-160308	03/08/2016	N	59029711	**150**	--	--	**150**	--	--	--	--	--	--	R	FBK, FDP	**83.0**	--	--	**40.0**	--	--	5.00	U	--	**30.0**	--	--	--	--	--	**8.60**	--	--
DC-01	DC-01-160620	6/20/2016	N	59037101	**150**	--	--	**150**	--	--	--	--	--	0.100	U	--	**83.0**	--	--	**40.0**	--	--	5.00	U	--	**31.0**	--	--	--	--	--	**9.20**	--	--
DC-01	DC-01-160928	9/28/2016	N	K1611629	**147**	--	--	**147**	--	--	--	--	--	0.050	U	MBK	**80.6**	--	--	**34.0**	--	--	**0.250**	--	--	**28.5**	--	--	--	--	--	**9.15**	--	--
DC-01	DC-01-161212	12/12/2016	N	K1615045	**144**	--	--	**144**	--	--	--	--	--	0.050	U	--	**81.1**	--	--	**31.9**	--	--	**0.390**	--	--	**27.9**	--	--	--	--	--	**8.89**	J	HTQ
DC-01	YVD-030817-18	3/8/2017	N	K1702324	**148**	--	--	**148**	--	--	--	--	--	1.00	U	--	**80.8**	--	--	**32.6**	--	--	**0.390**	--	--	**27.0**	--	--	--	--	--	**9.00**	--	--
DC-01	YVD-060417-03	6/4/2017	N	K1705702	**147**	--	--	**147**	--	--	--	--	--	0.050	U	--	**83.4**	--	--	**32.9**	--	--	**0.400**	--	--	**26.2**	--	--	--	--	--	**8.20**	--	--
DC-01	YVD-060417-05	6/4/2017	FD	K1705702	**147**	--	--	**147**	--	--	--	--	--	0.050	U	--	**83.0**	--	--	**33.2**	--	--	**0.380**	--	--	**25.7**	--	--	--	--	--	**8.20**	--	--
DC-01	YVD-092517-13	9/25/2017	N	K1710333	**148**	--	--	**148**	--	--	--	--	--	0.050	U	--	**78.9**	--	--	**33.2**	--	--	**0.370**	--	--	**26.1**	--	--	--	--	--	**8.41**	--	--
DC-01	YVD-120617-31	12/6/2017	N	K1713157	**146**	--	--	**146**	--	--	--	--	--	0.050	U	--	**83.7**	--	--	**33.2**	--	--	**0.370**	--	--	**28.1**	--	--	--	--	--	**8.81**	--	--
DC-01	YVD-060418-19	6/4/2018	N	874662	**141**	--	--	**141**	--	--	0.070	U	FBK	--	--	--	**80.5**	--	--	**34.6**	--	--	**0.360**	--	--	**28.8**	--	--	--	--	--	**8.60**	--	--
DC-01	YVD-060219-03	6/2/2019	N	991939	**142**	--	--	**142**	--	--	0.070	U	--	--	--	--	**76.5**	--	--	46.3	U	FBK	0.990	U	FBK	**26.2**	--	--	--	--	--	**8.60**	--	--
DC-01	YVD-060820-07	6/8/2020	N	009144	**143**	--	--	**143**	--	--	0.070	U	--	--	--	--	**76.0**	--	--	**33.1**	--	--	**0.300**	--	--	**26.3**	--	--	--	--	--	**7.60**	--	--
DC-01	YVD-060721-10	6/7/2021	N	124105	**140**	--	--	**140**	--	--	0.070	U	--	--	--	--	**72.5**	--	--	**32.4**	--	--	**0.320**	--	--	**25.2**	--	--	--	--	--	**8.00**	--	--
DC-01	YVD-060622-15	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**7.80**	--	--
DC-01	YVD-061923-02	6/19/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**7.79**	J	HTQ
DC-03	DC-03-130102	01/02/2013	N	EPA01	--	--	--	--	--	--	--	--	--	0.100	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**190**	--	--
DC-03	DC-03-130918	09/18/2013	N	SWI0138	**435**	--	--	**435**	--	--	--	--	--	0.100	U	--	**284**	--	--	**176**	--	--	5.00	U	--	**73.7**	--	--	--	--	--	**166**	--	--
DC-03	DC-03-131212	12/12/2013	N	SWL0078	**474**	--	--	**475**	--	--	--	--	--	0.020	U	--	**280**	--	--	**172**	--	--	5.00	U	--	**75.0**	--	--	--	--	--	**174**	--	--
DC-03	YVD-D3-131212	12/12/2013	FD	SWL0078	**459**	--	--	**460**	--	--	--	--	--	0.020	U	--	**292**	--	--	**142**	--	--	5.00	U	--	**77.3**	--	--	--	--	--	**182**	--	--
DC-03	DC-03-140319	03/19/2014	N	SXC0107	**459**	--	--	**460**	--	--	--	--	--	0.100	U	--	**261**	--	--	**159**	J	FDP	5.00	U	--	**66.8**	--	--	--	--	--	**195**	--	--
DC-03	YVD-D3-140319	03/19/2014	FD	SXC0107	**469**	--	--	**470**	--	--	--	--	--	0.100	U	--	**261**	--	--	**128**	J	FDP	5.00	U	--	**66.7**	--	--	--	--	--	**164**	--	--
DC-03	DC-03-140604	06/04/2014	N	SXF0025	**425**	--	--	**425**	--	--	--	--	--	0.100	U	--	**259**	--	--	**201**	--	--	10.0	U	--	**67.7**	--	--	--	--	--	**234**	--	--
DC-03	DC-03-140924	09/24/2014	N	SXI0173	**409**	--	--	**410**	--	--	--	--	--	0.100	U	--	**291**	--	--	**147**	--	--	5.00	U	--	**77.1**	--	--	--	--	--	**170**	--	--
DC-03	DC-03-141217	12/17/2014	N	SXL0144	**429**	--	--	**430**	--	--	--	--	--	**0.180**	J+	FBK, MBK	**274**	--	--	**157**	--	--	10.0	U	--	**74.9**	--	--	--	--	--	**193**	--	--
DC-03	YVD-D4-141217	12/17/2014	FD	SXL0144	**423**	--	--	**425**	--	--	--	--	--	0.100	U	--	**271**	--	--	**182**	--	--	5.00	U	--	**72.6**	--	--	--	--	--	**156**	--	--
DC-03	DC-03-150318	03/18/2015	N	5904651	**420**	--	--	**420**	--	--	--	--	--	0.100	U	--	**260**	--	--	**160**	--	--	5.00	U	--	**73.0**	--	--	--	--	--	**180**	--	--
DC-03	YVD-D4-150318	03/18/2015	FD	5904651	**410**	--	--	**410**	--	--	--	--	--	**0.120**	--	--	**270**	--	--	**150**	--	--	2.50	U	--	**74.0**	--	--	--	--	--	**180**	--	--
DC-03	DC-03-150617	06/17/2015	N	59011021	**460**	--	--	**460**	--	--	--	--	--	0.100	U	--	**290**	--	--	**170**	--	--	5.00	U	--	**78.0**	J	RPD	--	--	--	**180**	J--	MSD, FBD, FDP
DC-03	YVD-D4-150617	06/17/2015	FD	59011021	**450**	--	--	**450**	--	--	--	--	--	0.100	U	--	**290**	--	--	**180**	--	--	5.00	U	--	**77.0**	J	RPD	--	--	--	**10**	J--	MSD, FBD, FDP
DC-03	DC-03-150925	09/25/2015	N	59020431	**390**	--	--	**390**	--	--	--	--	--	**0.100**	--	--	**270**	--	--	**140**	--	--	10.0	U	--	**73.0**	--	--	--	--	--	**180**	--	--
DC-03	YVD-D4-150925	09/25/2015	FD	59020431	**460**	--	--	**460**	--	--	--	--	--	**0.200**	--	--	**260**	--	--	**140**	--	--	0.50	U	--	**69.0**	--	--	--	--	--	**180**	--	--
DC-03	DC-03-151216	12/16/2015	N	59025501	**400**	--	--	**400**	--	--	--	--	--	**0.180**	J--	MSD	**260**	--	--	**170**	--	--	5.00	U	--	**75.0**	--	--	--	--	--	**200**	--	--
DC-03	YVD-D4-151216	12/16/2015	FD	59025501	**380**	--	--	**380**	--	--	--	--	--	--	R	MSD	**250**	--	--	**160**	--	--	2.50	U	--	**75.0**	--	--	--	--	--	**170**	--	--
DC-03	DC-03-160310	03/10/2016	N	59029941	**460**	--	--	**460**	--	--	--	--	--	0.100	U	--	**270**	--	--	**150**	--	--	5.00	U	--	**72.0**	--	--	--	--	--	**180**	--	--
DC-03	YVD-D4-160310	03/10/2016	FD	59029941	**480**	--	--	**480**	--	--	--	--	--	0.100	U	--	**270**	--	--	**160**	--	--	5.00	U	--	**72.0**	--	--	--	--	--	**190**	--	--
DC-03	DC-03-160623	6/23/2016	N	59037371	**420**	--	--	**420**	--	--	--	--	--	**0.120**	J--	MSD	**270**	--	--	**150**	--	--	5.00	U	--	**73.0**	--	--	--	--	--	**180**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-03	YVD-D4-160623	6/23/2016	FD	59037371	**410**	--	--	**410**	--	--	--	--	--	**0.110**	J--	MSD	**250**	--	--	**160**	--	--	2.50	U	--	**71.0**	--	--	--	--	--	**170**	--	--
DC-03	DC-03-160927	9/27/2016	N	K1611565	**425**	--	--	**425**	--	--	--	--	--	0.050	U	MBK	**265**	--	--	**136**	--	--	**0.200**	J	--	**72.4**	--	--	--	--	--	**163**	--	--
DC-03	DC-03-D2-160927	9/27/2016	FD	K1611565	**427**	--	--	**427**	--	--	--	--	--	0.050	U	MBK	**262**	--	--	**137**	--	--	**0.190**	J	--	**71.9**	--	--	--	--	--	**163**	--	--
DC-03	DC-03-161212	12/12/2016	N	K1615029	**371**	--	--	**371**	--	--	--	--	--	0.050	U	--	**254**	--	--	**131**	--	--	**0.240**	--	--	**65.7**	--	--	--	--	--	**168**	J	HTQ
DC-03	YVD-030817-13	3/8/2017	N	K1702324	**381**	--	--	**381**	--	--	--	--	--	1.00	U	--	**267**	--	--	**150**	--	--	**0.220**	--	--	**66.0**	--	--	--	--	--	**179**	--	--
DC-03	YVD-060517-02	6/5/2017	N	K1705702	**358**	--	--	**358**	--	--	--	--	--	0.050	U	--	**271**	--	--	**152**	--	--	**0.240**	--	--	**61.6**	--	--	--	--	--	**181**	--	--
DC-03	YVD-060517-04	6/5/2017	FD	K1705702	**360**	--	--	**360**	--	--	--	--	--	0.050	U	--	**269**	--	--	**152**	--	--	**0.280**	--	--	**70.6**	--	--	--	--	--	**182**	--	--
DC-03	YVD-092617-22	9/26/2017	N	K1710333	**329**	--	--	**329**	--	--	--	--	--	0.050	U	--	**279**	--	--	**154**	--	--	**0.240**	--	--	**68.9**	--	--	--	--	--	**192**	--	--
DC-03	YVD-120417-10	12/4/2017	N	K1713026	**333**	--	--	**333**	--	--	--	--	--	0.050	U	--	**274**	--	--	**161**	--	--	**0.240**	--	--	**69.4**	--	--	--	--	--	**207**	--	--
DC-03	YVD-031818-04	3/18/2018	N	870610	**374**	--	--	**374**	--	--	0.070	U	--	--	--	--	**280**	--	--	**156**	--	--	**0.190**	--	--	**67.0**	--	--	--	--	--	**192**	--	--
DC-03	YVD-060418-22	6/4/2018	N	874860	**358**	--	--	**358**	--	--	**1.22**	--	--	--	--	--	**266**	--	--	**152**	--	--	**0.190**	--	--	**67.0**	--	--	--	--	--	**184**	--	--
DC-03	YVD-090918-17	9/9/2018	N	880601	**460**	--	--	**460**	--	--	0.070	U	--	--	--	--	**267**	--	--	**133**	--	--	**0.200**	--	--	**65.5**	--	--	--	--	--	**157**	--	--
DC-03	YVD-121018-03	12/10/2018	N	884857	**415**	--	--	**415**	--	--	0.070	U	--	--	--	--	**263**	--	--	**142**	--	--	0.200	U	FBK	**65.5**	J	MSD	--	--	--	**180**	--	--
DC-03	YVD-031819-19	3/18/2019	N	988273	**435**	--	--	**435**	--	--	0.070	U	--	--	--	--	**276**	--	--	**150**	--	--	**0.190**	--	--	**66.0**	--	--	--	--	--	**186**	--	--
DC-03	YVD-060419-32	6/4/2019	N	992242	**406**	--	--	**406**	--	--	**0.270**	--	--	--	--	--	**282**	--	--	**155**	--	--	**0.270**	--	--	**70.0**	--	--	--	--	--	**178**	--	--
DC-03	YVD-091019-23	9/10/2019	N	998438	**463**	--	--	**463**	--	--	0.070	U	--	--	--	--	**285**	--	--	**132**	--	--	**0.150**	--	--	**74.0**	--	--	--	--	--	**180**	--	--
DC-03	YVD-121019-22	12/10/2019	N	902321	**433**	--	--	**433**	--	--	0.070	U	--	--	--	--	**261**	--	--	**121**	--	--	**0.170**	--	--	**65.5**	--	--	--	--	--	**175**	--	--
DC-03	YVD-033120-22	3/31/2020	N	006260	**418**	--	--	**418**	--	--	0.070	U	--	--	--	--	**284**	--	--	**136**	--	--	**0.170**	--	--	**71.0**	--	--	--	--	--	**166**	--	--
DC-03	YVD-060920-26	6/9/2020	N	009269	**426**	--	--	**426**	--	--	0.070	U	--				**298**	--	--	**163**	--	--	**0.140**	--	--	**75.0**	--	--	--	--	--	**205**	--	--
DC-03	YVD-092120-21	9/21/2020	N	013896	**429**	--	--	**429**	--	--	0.070	U	--	--	--	--	**284**	--	--	**140**	--	--	**0.240**	--	--	**73.5**	--	--	--	--	--	**177**	--	--
DC-03	YVD-120720-05	12/7/2020	N	017035	**430**	--	--	**430**	--	--	0.070	U	--	--	--	--	**260**	--	--	**122**	--	--	**0.150**	--	--	**64.5**	--	--	--	--	--	**144**	--	--
DC-03	YVD-120720-07	12/7/2020	FD	017035	**431**	--	--	**431**	--	--	0.070	U	--	--	--	--	**256**	--	--	**122**	--	--	**0.150**	--	--	**64.5**	--	--	--	--	--	**153**	--	--
DC-03	YVD-030221-23	3/2/2021	N	120034	**393**	--	--	**393**	--	--	0.070	U	--	--	--	--	**286**	--	--	**141**	--	--	**0.170**	--	--	**69.0**	--	--	--	--	--	**186**	--	--
DC-03	YVD-060821-27	6/8/2021	N	124212	**406**	--	--	**406**	--	--	0.070	U	--	--	--	--	**280**	--	--	**150**	--	--	0.100	U	--	**69.5**	--	--	--	--	--	**185**	--	--
DC-03	YVD-031522-10	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**182**	--	--
DC-03	YVD-031522-11	3/15/2022	FD	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**183**	--	--
DC-03	YVD-060522-10	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**157**	--	--
DC-03	YVD-091322-12	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**155**	--	--
DC-03	YVD-122722-21	12/27/2022	N	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**138**	--	--
DC-03	YVD-030623-15	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**140**	--	--	--	--	--
DC-03	YVD-062023-20	6/20/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**130**	J	HTQ
DC-03	YVD-091023-06	9/10/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**139**	J	HTQ
DC-03D	DC-03D-130918	09/18/2013	N	SWI0138	**509**	--	--	**510**	--	--	--	--	--	0.100	U	--	**198**	--	--	**56.0**	--	--	5.00	U	--	**44.0**	--	--	--	--	--	**46.4**	--	--
DC-03D	DC-03D-131212	12/12/2013	N	SWL0073	**559**	--	--	**560**	--	--	--	--	--	0.020	UJ	MSD	**194**	--	--	**67.9**	--	--	5.00	U	--	**43.3**	--	--	--	--	--	**38.9**	--	--
DC-03D	DC-03D-140319	03/19/2014	N	SXC0107	**564**	--	--	**565**	--	--	--	--	--	**0.127**	--	--	**200**	--	--	**65.9**	--	--	5.00	U	--	**43.9**	--	--	--	--	--	**42.5**	--	--
DC-03D	DC-03D-140603	06/03/2014	N	SXF0017	**542**	--	--	**543**	--	--	--	--	--	0.100	U	--	**179**	--	--	**65.5**	--	--	2.00	U	--	**40.9**	--	--	--	--	--	**42.0**	--	--
DC-03D	DC-03D-140923	09/23/2014	N	SXI0173	**514**	--	--	**515**	--	--	--	--	--	0.100	U	--	**216**	--	--	**59.5**	--	--	2.50	U	--	**46.6**	--	--	--	--	--	**38.0**	--	--
DC-03D	DC-03D-141217	12/17/2014	N	SXL0121	**514**	--	--	**515**	--	--	--	--	--	0.100	U	--	**203**	--	--	**62.8**	--	--	2.50	U	--	**46.8**	--	--	--	--	--	**38.6**	--	--
DC-03D	DC-03D-150317	03/17/2015	N	5904651	**530**	--	--	**530**	--	--	--	--	--	0.100	U	--	**210**	--	--	**63.0**	--	--	2.50	U	--	**48.0**	--	--	--	--	--	**37.0**	--	--
DC-03D	DC-03D-150617	06/17/2015	N	59011021	**530**	--	--	**530**	--	--	--	--	--	0.100	U	--	**210**	--	--	**71.0**	--	--	2.50	U	--	**48.0**	J	RPD	--	--	--	**42.0**	J--	MSD
DC-03D	DC-03D-150925	09/25/2015	N	59020431	**610**	--	--	**610**	--	--	--	--	--	0.100	U	--	**200**	--	--	**58.0**	--	--	10.0	U	--	**47.0**	--	--	--	--	--	**33.0**	--	--
DC-03D	DC-03D-151216	12/16/2015	N	59025501	**590**	--	--	**590**	--	--	--	--	--	--	R	MSD	**210**	--	--	**70.0**	--	--	2.50	U	--	**50.0**	--	--	--	--	--	**36.0**	--	--
DC-03D	DC-03D-160310	03/10/2016	N	59029941	**580**	--	--	**580**	--	--	--	--	--	0.100	U	--	**200**	--	--	**65.0**	--	--	2.50	U	--	**47.0**	--	--	--	--	--	**37.0**	--	--
DC-03D	DC-03D-160623	6/23/2016	N	59037371	**530**	--	--	**530**	--	--	--	--	--	**0.110**	J--	MSD	**200**	--	--	**65.0**	--	--	5.00	U	--	**47.0**	--	--	--	--	--	**36.0**	--	--
DC-03D	DC-03D-160927	9/27/2016	N	K1611565	**546**	--	--	**546**	--	--	--	--	--	0.050	U	MBK	**188**	--	--	**58.7**	--	--	**0.100**	J	--	**47.1**	--	--	--	--	--	**32.8**	--	--
DC-03D	DC-03D-161212	12/12/2016	N	K1615029	**544**	--	--	**544**	--	--	--	--	--	0.050	U	--	**200**	--	--	**57.8**	--	--	**0.120**	J	--	**44.8**	--	--	--	--	--	**33.8**	J	HTQ
DC-03D	YVD-030817-14	3/8/2017	N	K1702324	**537**	--	--	**537**	--	--	--	--	--	1.00	U	--	**196**	--	--	**59.5**	--	--	**0.160**	J	--	**43.4**	--	--	--	--	--	**32.9**	--	--
DC-03D	YVD-030817-16	3/8/2017	FD	K1702324	**555**	--	--	**555**	--	--	--	--	--	1.00	U	--	**194**	--	--	**59.1**	--	--	**0.170**	J	--	**42.7**	--	--	--	--	--	**32.8**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-03D	YVD-060517-09	6/5/2017	N	K1705702	**533**	--	--	**533**	--	--	--	--	--	0.050	U	--	**203**	--	--	**58.7**	--	--	**0.130**	J	--	**41.3**	--	--	--	--	--	**31.9**	--	--
DC-03D	YVD-092617-24	9/26/2017	N	K1710333	**537**	--	--	**537**	--	--	--	--	--	0.050	U	--	**194**	--	--	**60.1**	--	--	**0.120**	J	--	**44.2**	--	--	--	--	--	**33.2**	--	--
DC-03D	YVD-120417-08	12/4/2017	N	K1713026	**525**	--	--	**525**	--	--	--	--	--	0.050	U	--	**195**	--	--	**57.9**	--	--	**0.170**	J	--	**41.5**	--	--	--	--	--	**33.6**	--	--
DC-03D	YVD-031818-02	3/18/2018	N	870610	**529**	--	--	**529**	--	--	0.070	U	--	--	--	--	**199**	--	--	**66.1**	--	--	0.100	U	--	**42.7**	--	--	--	--	--	**32.6**	--	--
DC-03D	YVD-060418-24	6/4/2018	N	874860	**533**	--	--	**533**	--	--	0.070	U	--	--	--	--	**187**	--	--	**64.7**	--	--	**0.100**	--	--	**42.9**	--	--	--	--	--	**31.0**	--	--
DC-03D	YVD-090918-15	9/9/2018	N	880601	**541**	--	--	**541**	--	--	0.070	U	--	--	--	--	**200**	--	--	**69.5**	--	--	**0.100**	--	--	**42.9**	--	--	--	--	--	**32.9**	--	--
DC-03D	YVD-121018-05	12/10/2018	N	884857	**543**	--	--	**543**	--	--	0.070	U	--	--	--	--	**191**	--	--	**62.1**	--	--	0.100	U	FBK	**42.5**	J	MSD	--	--	--	**34.8**	--	--
DC-03D	YVD-031819-17	3/18/2019	N	988273	**536**	--	--	**536**	--	--	0.070	U	--	--	--	--	**192**	--	--	**61.4**	--	--	**0.130**	--	--	**41.6**	--	--	--	--	--	**35.4**	--	--
DC-03D	YVD-060419-30	6/4/2019	N	992242	**499**	--	--	**499**	--	--	0.070	U	--	--	--	--	**186**	--	--	**59.6**	--	--	0.100	U	--	**40.4**	--	--	--	--	--	**36.6**	--	--
DC-03D	YVD-060419-31	6/4/2019	FD	992242	**494**	--	--	**494**	--	--	0.070	U	--	--	--	--	**182**	--	--	**60.6**	--	--	0.100	U	--	**40.7**	--	--	--	--	--	**37.2**	--	--
DC-03D	YVD-091019-21	9/10/2019	N	998438	**506**	--	--	**506**	--	--	0.070	U	--	--	--	--	**186**	--	--	**58.4**	--	--	0.100	U	--	**41.0**	--	--	--	--	--	**36.4**	--	--
DC-03D	YVD-091019-22	9/10/2019	FD	998438	**514**	--	--	**514**	--	--	0.070	U	--	--	--	--	**186**	--	--	**58.3**	--	--	0.100	U	--	**41.2**	--	--	--	--	--	**36.5**	--	--
DC-03D	YVD-121019-20	12/10/2019	N	902321	**502**	--	--	**502**	--	--	0.070	U	--	--	--	--	**182**	--	--	**65.0**	--	--	0.100	U	--	**39.9**	--	--	--	--	--	**36.2**	--	--
DC-03D	YVD-033120-20	3/31/2020	N	006260	**456**	--	--	**456**	--	--	0.070	U	--	--	--	--	**175**	--	--	**58.5**	--	--	0.100	U	--	**38.4**	--	--	--	--	--	**39.0**	--	--
DC-03D	YVD-061020-34	6/10/2020	N	009361	**458**	--	--	**458**	--	--	0.070	U	--	--	--	--	**168**	--	--	**60.8**	--	--	0.100	U	--	**36.2**	J	MS	--	--	--	**37.0**	--	--
DC-03D	YVD-092120-19	9/21/2020	N	013896	**460**	--	--	**460**	--	--	0.070	U	--	--	--	--	**176**	--	--	**68.9**	--	--	0.100	U	--	**38.3**	--	--	--	--	--	**38.5**	--	--
DC-03D	YVD-120720-09	12/7/2020	N	017035	**452**	--	--	**452**	--	--	0.070	U	--	--	--	--	**174**	--	--	**66.3**	--	--	**0.150**	--	--	**38.6**	--	--	--	--	--	**35.8**	--	--
DC-03D	YVD-030221-21	3/2/2021	N	120034	**481**	--	--	**481**	--	--	0.070	U	--	--	--	--	**181**	--	--	**69.6**	--	--	0.100	U	--	**39.2**	--	--	--	--	--	**39.8**	--	--
DC-03D	YVD-030221-21	3/2/2021	N	120034	**481**	--	--	**481**	--	--	0.070	U	--	--	--	--	**181**	--	--	**69.6**	--	--	0.100	U	--	**39.2**	--	--	--	--	--	**39.8**	--	--
DC-03D	YVD-060821-29	6/8/2021	N	124212	**456**	--	--	**456**	--	--	0.070	U	--	--	--	--	**175**	--	--	**66.8**	--	--	0.100	U	--	**39.0**	--	--	--	--	--	**41.4**	--	--
DC-03D	YVD-060821-31	6/8/2021	FD	124212	**455**	--	--	**455**	--	--	0.070	U	--	--	--	--	**174**	--	--	**66.7**	--	--	0.100	U	--	**38.4**	--	--	--	--	--	**39.9**	--	--
DC-03D	YVD-121421-10	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**35.1**	--	--
DC-03D	YVD-031422-08	3/14/2022	N	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**41.6**	--	--
DC-03D	YVD-060522-11	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**39.1**	--	--
DC-03D	YVD-060522-11	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**39.1**	--	--
DC-03D	YVD-091322-10	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**37.7**	--	--
DC-03D	YVD-122722-20	12/27/2022	N	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**36.8**	--	--
DC-03D	YVD-030623-14	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**40.7**	--	--	--	--	--
DC-03D	YVD-062023-17	6/20/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**36.0**	J	HTQ
DC-03D	YVD-062023-18	6/20/2023	FD	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**36.2**	J	HTQ
DC-03D	YVD-091023-04	9/10/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**36.7**	J	HTQ
DC-04	DC-04-130103	01/03/2013	N	EPA01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**26.0**	--	--
DC-04	DC-04-130920	09/20/2013	N	SWI0142	**305**	--	--	**305**	--	--	--	--	--	0.100	U	--	**141**	--	--	**39.4**	--	--	5.00	U	--	**25.5**	--	--	--	--	--	--	--	--
DC-04	DC-04-130924	09/24/2013	N	SWI0175	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**31.7**	--	--
DC-04	DC-04-131212	12/12/2013	N	SWL0073	**315**	--	--	**315**	--	--	--	--	--	0.020	UJ	MSD	**148**	--	--	**41.1**	--	--	5.00	U	--	**28.4**	--	--	--	--	--	**36.7**	--	--
DC-04	DC-04-140318	03/18/2014	N	SXC0107	**325**	--	--	**325**	--	--	--	--	--	0.100	U	--	**153**	--	--	**42.0**	--	--	5.00	U	--	**28.0**	--	--	--	--	--	**37.3**	--	--
DC-04	DC-04-140603	06/03/2014	N	SXF0017	**310**	--	--	**310**	--	--	--	--	--	0.100	U	--	**134**	--	--	**36.2**	--	--	2.00	U	--	**28.9**	--	--	--	--	--	**36.4**	--	--
DC-04	DC-04-140923	09/23/2014	N	SXI0173	**317**	--	--	**320**	--	--	--	--	--	0.100	U	--	**174**	--	--	**39.7**	--	--	2.50	U	--	**34.2**	--	--	--	--	--	**37.8**	--	--
DC-04	DC-04-141217	12/17/2014	N	SXL0121	**329**	--	--	**330**	--	--	--	--	--	0.100	U	--	**182**	--	--	**42.7**	--	--	2.50	U	--	**35.7**	--	--	--	--	--	**40.8**	--	--
DC-04	DC-04-150317	03/17/2015	N	5904651	**340**	--	--	**340**	--	--	--	--	--	0.100	U	--	**180**	--	--	**41.0**	--	--	2.50	U	--	**34.0**	--	--	--	--	--	**39.0**	--	--
DC-04	DC-04-150617	06/17/2015	N	59010961	**330**	--	--	**330**	--	--	--	--	--	0.100	U	--	**180**	--	--	**46.0**	--	--	5.00	U	--	**34.0**	--	--	--	--	--	**42.0**	--	--
DC-04	DC-04-150924	09/24/2015	N	59020391	**400**	--	--	**400**	--	--	--	--	--	0.100	UJ	MSD	**160**	--	--	**48.0**	--	--	2.50	U	--	**36.0**	--	--	--	--	--	**48.0**	J+	MSD
DC-04	YVD-D3-150924	09/24/2015	FD	59020391	**380**	--	--	**380**	--	--	--	--	--	0.100	UJ	MSD	**170**	--	--	**53.0**	--	--	2.50	U	--	**37.0**	--	--	--	--	--	**53.0**	J+	MSD
DC-04	DC-04-151215	12/15/2015	N	59025431	**400**	J	FDP	**400**	J	FDP	--	--	--	--	R	MSD	**180**	--	--	**46.0**	--	--	2.50	U	--	**36.0**	--	--	--	--	--	**48.0**	--	--
DC-04	DC-04-160309	03/09/2016	N	59029711	**390**	--	--	**390**	--	--	--	--	--	0.100	UJ	FDP	**190**	--	--	**53.0**	--	--	2.50	U	--	**36.0**	--	--	--	--	--	**53.0**	--	--
DC-04	DC-04-160621	6/21/2016	N	59037271	**360**	--	--	**360**	--	--	--	--	--	0.100	UJ	MSD	**200**	--	--	**50.0**	--	--	2.50	U	--	**40.0**	--	--	--	--	--	**50.0**	--	--
DC-04	DC-04-160926	9/26/2016	N	K1611506	**374**	--	--	**374**	--	--	--	--	--	0.050	U	MBK	**194**	--	--	**43.4**	--	--	**0.120**	J	--	**40.6**	--	--	--	--	--	**44.1**	--	--
DC-04	DC-04-161216	12/12/2016	N	K1615174	**384**	--	--	**384**	--	--	--	--	--	0.050	U	--	**214**	--	--	**44.7**	--	--	**0.150**	J	--	**39.7**	--	--	--	--	--	**45.2**	--	--
DC-04	YVD-031017-31	3/10/2017	N	K1702448	**375**	--	--	**375**	--	--	--	--	--	0.050	U	--	**219**	--	--	**43.1**	--	--	**0.160**	J	--	**36.3**	--	--	--	--	--	**46.0**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-04	YVD-031017-33	3/10/2017	FD	K1702448	**383**	--	--	**383**	--	--	--	--	--	0.050	U	--	**219**	--	--	**43.2**	--	--	**0.160**	J	--	**36.3**	--	--	--	--	--	**45.7**	--	--
DC-04	YVD-060617-26	6/6/2017	N	K1705833	**390**	--	--	**390**	--	--	--	--	--	0.050	U	--	**202**	--	--	**38.6**	--	--	**0.130**	J	--	**37.0**	--	--	--	--	--	**38.4**	--	--
DC-04	YVD-092517-06	9/25/2017	N	K1710274	**391**	--	--	**391**	--	--	--	--	--	0.050	U	--	**192**	--	--	**35.2**	--	--	**0.140**	J	--	**37.0**	--	--	--	--	--	**33.7**	--	--
DC-04	YVD-120517-24	12/5/2017	N	K1713091	**388**	--	--	**388**	--	--	--	--	--	0.050	U	--	**188**	--	--	**34.3**	--	--	**0.120**	J	--	**32.7**	--	--	--	--	--	**33.8**	J	HTQ
DC-04	YVD-031818-07	3/18/2018	N	870610	**377**	--	--	**377**	--	--	0.070	U	--	--	--	--	**182**	--	--	**34.5**	--	--	0.100	U	--	**32.1**	--	--	--	--	--	**32.9**	--	--
DC-04	YVD-060418-18	6/4/2018	N	874662	**380**	--	--	**380**	--	--	0.070	U	FBK	--	--	--	**182**	--	--	**35.4**	--	--	**0.100**	--	--	**33.6**	--	--	--	--	--	**33.0**	--	--
DC-04	YVD-090918-18	9/9/2018	N	880601	**371**	--	--	**371**	--	--	0.070	U	--	--	--	--	**176**	--	--	**32.4**	--	--	**0.120**	--	--	**30.4**	--	--	--	--	--	**30.4**	--	--
DC-04	YVD-121118-18	12/11/2018	N	884939	**376**	--	--	**376**	--	--	0.070	U	--	--	--	--	**166**	--	--	**30.4**	--	--	**0.110**	--	--	**29.4**	--	--	--	--	--	**29.4**	--	--
DC-04	YVD-032019-21	3/20/2019	N	988477	**393**	--	--	**393**	--	--	0.070	U	--	--	--	--	**172**	--	--	**26.2**	--	--	**0.100**	--	--	**30.5**	--	--	--	--	--	**29.6**	--	--
DC-04	YVD-060219-14	6/2/2019	N	991939	**390**	--	--	**390**	--	--	**0.090**	--	--	--	--	--	**173**	--	--	22.9	U	FBK	0.100	U	--	**30.6**	--	--	--	--	--	**29.1**	--	--
DC-04	YVD-090919-09	9/9/2019	N	998357	**387**	--	--	**387**	--	--	0.070	U	--	--	--	--	**169**	--	--	**33.1**	--	--	0.100	U	--	**30.4**	--	--	--	--	--	**31.4**	--	--
DC-04	YVD-120919-07	12/9/2019	N	902276	**382**	--	--	**382**	--	--	0.070	U	--	--	--	--	**167**	--	--	**33.4**	--	--	0.100	U	--	**30.4**	--	--	--	--	--	**31.3**	--	--
DC-04	YVD-033120-18	3/31/2020	N	006260	**390**	--	--	**390**	--	--	0.070	U	--	--	--	--	**171**	--	--	**34.1**	--	--	**0.100**	--	--	**30.5**	--	--	--	--	--	**29.8**	--	--
DC-04	YVD-060820-08	6/8/2020	N	009144	**395**	--	--	**395**	--	--	0.070	U	--	--	--	--	**173**	--	--	**34.5**	--	--	**0.100**	--	--	**31.0**	--	--	--	--	--	**30.9**	--	--
DC-04	YVD-092020-07	9/20/2020	N	013864	**403**	--	--	**403**	--	--	0.070	U	--	--	--	--	**184**	--	--	**39.4**	--	--	0.100	U	--	**33.4**	--	--	--	--	--	**34.1**	--	--
DC-04	YVD-120820-23	12/8/2020	N	017137	**422**	--	--	**422**	--	--	0.070	U	--	--	--	--	**193**	--	--	**41.3**	--	--	0.100	U	--	**34.7**	--	--	--	--	--	**34.4**	--	--
DC-04	YVD-030221-20	3/2/2021	N	120034	**443**	--	--	**443**	--	--	0.070	U	--	--	--	--	**208**	--	--	**46.2**	--	--	**0.150**	--	--	**36.2**	--	--	--	--	--	**35.0**	--	--
DC-04	YVD-030221-22	3/2/2021	FD	120034	**440**	--	--	**440**	--	--	0.070	U	--	--	--	--	**200**	--	--	**45.7**	--	--	**0.150**	--	--	**35.7**	--	--	--	--	--	**34.3**	--	--
DC-04	YVD-030221-20	3/2/2021	N	120034	**443**	--	--	**443**	--	--	0.070	U	--	--	--	--	**208**	--	--	**46.2**	--	--	**0.150**	--	--	**36.2**	--	--	--	--	--	**35.0**	--	--
DC-04	YVD-030221-22	3/2/2021	FD	120034	**440**	--	--	**440**	--	--	0.070	U	--	--	--	--	**200**	--	--	**45.7**	--	--	**0.150**	--	--	**35.7**	--	--	--	--	--	**34.3**	--	--
DC-04	YVD-060621-06	6/6/2021	N	124053	**438**	--	--	**438**	--	--	0.070	U	--	--	--	--	**195**	--	--	**39.6**	--	--	0.100	U	--	**34.8**	--	--	--	--	--	**30.9**	--	--
DC-04	YVD-121521-21	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**32.7**	J	HTQ, MS
DC-04	YVD-031522-15	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**35.3**	--	--
DC-04	YVD-060522-05	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**34.5**	--	--
DC-04	YVD-091322-06	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**33.0**	--	--
DC-04	YVD-120722-09	12/7/2022	N	K2214479	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**30.2**	--	--
DC-04	YVD-120722-10	12/7/2022	FD	K2214479	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**30.4**	--	--
DC-04	YVD-030623-17	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**29.9**	--	--	--
DC-04	YVD-030623-18	3/6/2023	FD	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**29.7**	--	--	--
DC-04	YVD-062023-11	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**27.6**	J	HTQ
DC-04	YVD-091123-22	9/11/2023	N	K2310209	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**24.9**	J	HTQ
DC-05	DC-05-130104	01/04/2013	N	EPA01	--		--	--		--	--	--	--	--		--	--		--	--		--	--		--	--		--	--	--	--	**32.0**		--
DC-05	DC-05-130920	09/20/2013	N	SWI0142	**414**		--	**415**		--	--	--	--	**0.255**		--	**129**		--	**36.7**		--	5.00	U	--	**48.5**		--	--	--	--	--		--
DC-05	DC-05-130924	09/24/2013	N	SWI0175	--		--	--		--	--	--	--	--		--	--		--	--		--	--		--	--		--	--	--	--	**33.6**		--
DC-05	DC-05-131212	12/12/2013	N	SWL0073	**424**	--	--	**425**	--	--	--	--	--	0.020	UJ	MSD	**130**	--	--	**35.9**	--	--	5.00	U	--	**50.2**	--	--	--	--	--	**42.6**	--	--
DC-05	DC-05-140318	03/18/2014	N	SXC0107	**404**	--	--	**405**	--	--	--	--	--	**0.131**	--	--	**133**	--	--	**33.0**	--	--	5.00	U	--	**49.7**	--	--	--	--	--	**33.1**	--	--
DC-05	DC-05-140603	06/03/2014	N	SXF0017	**412**	--	--	**413**	--	--	--	--	--	0.100	U	--	**118**	--	--	**31.6**	--	--	2.00	U	--	**46.7**	--	--	--	--	--	**32.6**	--	--
DC-05	DC-05-140923	09/23/2014	N	SXI0173	**408**	--	--	**410**	--	--	--	--	--	0.100	U	--	**140**	--	--	**35.0**	--	--	2.50	U	--	**53.5**	--	--	--	--	--	**35.8**	--	--
DC-05	DC-05-141217	12/17/2014	N	SXL0121	**414**	--	--	**415**	--	--	--	--	--	0.100	U	--	**147**	--	--	**34.4**	--	--	2.50	U	--	**58.9**	--	--	--	--	--	**33.4**	--	--
DC-05	DC-05-150317	03/17/2015	N	5904541	**430**	--	--	**430**	--	--	--	--	--	0.100	U	--	**150**	--	--	**36.0**	--	--	**2.00**	--	--	**58.0**	--	--	--	--	--	**38.0**	J--	MSD
DC-05	DC-05-150616	06/16/2015	N	59010961	**410**	--	--	**410**	--	--	--	--	--	0.100	U	--	**140**	--	--	**35.0**	--	--	2.00	U	--	**57.0**	--	--	--	--	--	**37.0**	--	--
DC-05	YVD-D2-150616	06/16/2015	FD	59010961	**410**	--	--	**410**	--	--	--	--	--	0.100	U	--	**140**	--	--	**35.0**	--	--	5.00	U	--	**56.0**	--	--	--	--	--	**41.0**	--	--
DC-05	DC-05-150923	09/23/2015	N	59020391	**440**	--	--	**440**	--	--	--	--	--	0.100	UJ	MSD	**130**	--	--	**33.0**	--	--	2.00	U	--	**57.0**	--	--	--	--	--	**38.0**	J+	MSD
DC-05	DC-05-151215	12/15/2015	N	59025431	**440**	J	FDP	**440**	J	FDP	--	--	--	--	R	MSD	**140**	--	--	**29.0**	--	--	2.00	U	--	**55.0**	--	--	--	--	--	**38.0**	--	--
DC-05	DC-05-160309	03/09/2016	N	59029711	**410**	--	--	**410**	--	--	--	--	--	0.100	UJ	FDP	**140**	--	--	**35.0**	--	--	2.00	U	--	**54.0**	--	--	--	--	--	**43.0**	--	--
DC-05	DC-05-160621	6/21/2016	N	59037151	**390**	--	--	**390**	--	--	--	--	--	0.100	UJ	--	**130**	--	--	**34.0**	--	--	2.00	U	--	**54.0**	--	--	--	--	--	**36.0**	--	--
DC-05	DC-05-160926	9/26/2016	N	K1611506	**346**	--	--	**346**	--	--	--	--	--	0.050	U	--	**119**	--	--	**26.5**	--	--	**0.150**	J	--	**49.7**	--	--	--	--	--	**32.1**	--	--
DC-05	DC-05-D1-160926	9/26/2016	FD	K1611506	**364**	--	--	**364**	--	--	--	--	--	0.050	U	MBK	**124**	--	--	**26.6**	--	--	**0.160**	J	--	**52.5**	--	--	--	--	--	**32.2**	--	--
DC-05	DC-05-161216	12/16/2016	N	K1615174	**348**	--	--	**348**	--	--	--	--	--	0.050	U	--	**129**	--	--	**28.6**	--	--	**0.190**	J	--	**45.4**	--	--	--	--	--	**33.7**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-05	YVD-D5-161216	12/16/2016	FD	K1615174	**340**	--	--	**340**	--	--	--	--	--	0.050	U	--	**128**	--	--	**28.9**	--	--	**0.190**	J	--	**48.0**	--	--	--	--	--	**33.3**	--	--
DC-05	YVD-030717-09	3/7/2017	N	K1702324	**367**	--	--	**367**	--	--	--	--	--	1.00	U	--	**117**	--	--	**28.5**	--	--	**0.200**	J	--	**43.5**	--	--	--	--	--	**32.9**	J	HTQ
DC-05	YVD-060717-30	6/7/2017	N	K1705833	**364**	--	--	**364**	--	--	--	--	--	0.050	U	--	**122**	--	--	**26.8**	--	--	**0.160**	J	--	**47.1**	--	--	--	--	--	**30.8**	--	--
DC-05	YVD-060717-32	6/7/2017	FD	K1705833	**364**	--	--	**364**	--	--	--	--	--	0.050	U	--	**122**	--	--	**26.3**	--	--	**0.160**	J	--	**45.8**	--	--	--	--	--	**30.7**	--	--
DC-05	YVD-092517-04	9/25/2017	N	K1710274	**368**	--	--	**368**	--	--	--	--	--	0.050	U	--	**126**	--	--	**28.1**	--	--	**0.190**	J	--	**49.7**	--	--	--	--	--	**30.7**	--	--
DC-05	YVD-120517-16	12/5/2017	N	K1713091	**364**	--	--	**364**	--	--	--	--	--	0.050	U	--	**119**	--	--	**31.9**	--	--	**0.180**	J	--	**42.5**	--	--	--	--	--	**34.5**	J	HTQ
DC-05	YVD-120517-18	12/5/2017	FD	K1713091	**366**	--	--	**366**	--	--	--	--	--	0.050	U	--	**120**	--	--	**31.3**	--	--	**0.190**	J	--	**43.1**	--	--	--	--	--	**33.9**	J	HTQ
DC-05	YVD-031818-03	3/18/2018	N	870610	**364**	--	--	**364**	--	--	**0.100**	--	--	--	--	--	**116**	--	--	**33.0**	--	--	0.140	U	--	**42.4**	--	--	--	--	--	**33.6**	--	--
DC-05	YVD-031818-05	3/18/2018	FD	870610	**356**	--	--	**356**	--	--	0.070	U	--	--	--	--	**116**	--	--	**33.1**	--	--	**0.140**	--	--	**42.9**	--	--	--	--	--	**33.8**	--	--
DC-05	YVD-060318-02	6/3/2018	FD	874568	**368**	--	--	**368**	--	--	0.070	U	--	--	--	--	**118**	--	--	**32.2**	--	--	**0.150**	--	--	**43.5**	--	--	--	--	--	**34.4**	--	--
DC-05	YVD-090918-03	9/9/2018	N	880601	**378**	--	--	**378**	--	--	0.070	U	--	--	--	--	**122**	--	--	**31.4**	--	--	**0.180**	--	--	**42.6**	--	--	--	--	--	**31.5**	--	--
DC-05	YVD-121118-16	12/11/2018	N	884939	**390**	--	--	**390**	--	--	0.070	U	--	--	--	--	**120**	--	--	**33.7**	--	--	**0.160**	--	--	**43.4**	--	--	--	--	--	**33.2**	--	--
DC-05	YVD-031719-02	3/17/2019	N	988239	**396**	--	--	**396**	--	--	0.070	U	--	--	--	--	**126**	--	--	**29.9**	--	--	0.120	U	FBK	**44.3**	--	--	--	--	--	**30.4**	--	--
DC-05	YVD-060219-08	6/2/2019	N	991939	**400**	--	--	**400**	--	--	0.070	U	--	--	--	--	**122**	--	--	26.2	U	FBK	0.120	U	FBK	**44.2**	--	--	--	--	--	**28.8**	--	--
DC-05	YVD-090919-14	9/9/2019	N	998357	**389**	--	--	**389**	--	--	0.070	U	--	--	--	--	**120**	--	--	**25.4**	--	--	**0.140**	--	--	**42.3**	--	--	--	--	--	**26.7**	--	--
DC-05	YVD-120919-03	12/9/2019	N	902276	**400**	--	--	**400**	--	--	0.070	U	--	--	--	--	**120**	--	--	**28.1**	--	--	**0.140**	--	--	**43.0**	--	--	--	--	--	**29.3**	--	--
DC-05	YVD-033020-12	3/30/2020	N	006241	**402**	--	--	**402**	--	--	0.070	U	--	--	--	--	**120**	--	--	**26.0**	--	--	**0.140**	--	--	**43.5**	--	--	--	--	--	**25.6**	--	--
DC-05	YVD-060820-06	6/8/2020	N	009144	**404**	--	--	**404**	--	--	0.070	U	--	--	--	--	**116**	--	--	**24.4**	--	--	**0.160**	--	--	**41.8**	--	--	--	--	--	**24.0**	--	--
DC-05	YVD-092020-03	9/20/2020	N	013864	**387**	--	--	**387**	--	--	0.070	U	--	--	--	--	**126**	--	--	**26.8**	--	--	**0.120**	--	--	**45.1**	--	--	--	--	--	**27.8**	--	--
DC-05	YVD-120720-06	12/7/2020	N	017035	**372**	--	--	**372**	--	--	0.070	U	--	--	--	--	**130**	--	--	**24.0**	--	--	**0.120**	--	--	**47.6**	--	--	--	--	--	**29.6**	--	--
DC-05	YVD-030221-16	3/2/2021	N	120034	**388**	--	--	**388**	--	--	0.070	U	--	--	--	--	**139**	--	--	**30.5**	--	--	**0.120**	--	--	**49.3**	--	--	--	--	--	**32.3**	--	--
DC-05	YVD-060721-14	6/7/2021	N	124105	**360**	--	--	**360**	--	--	0.070	U	--	--	--	--	**129**	--	--	**34.9**	--	--	**0.170**	--	--	**46.5**	--	--	--	--	--	**38.5**	--	--
DC-05	YVD-121521-15	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**43.5**	J	HTQ, MS
DC-05	YVD-031422-04	3/14/2022	N	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**35.9**	--	--
DC-05	YVD-060522-02	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**41.7**	--	--
DC-05	YVD-060522-03	6/5/2022	FD	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**40.6**	--	--
DC-05	YVD-091322-02	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**18.6**	--	--
DC-05	YVD-091322-04	9/13/2022	FD	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**19.0**	--	--
DC-05	YVD-120622-02	12/6/2022	N	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**10.0**	--	--
DC-05	YVD-120622-03	12/6/2022	FD	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**10.0**	--	--
DC-05	YVD-030623-20	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**12.5**	--	--	--	--	--
DC-05	YVD-062023-08	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**33.9**	J	HTQ
DC-05	YVD-091123-16	9/11/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**41.5**	--	--
DC-05D	DC-05D-130920	09/20/2013	N	SWI0142	**214**	--	--	**215**	--	--	--	--	--	0.100	U	--	**86.7**	--	--	**43.6**	--	--	5.00	U	--	**30.3**	--	--	--	--	--	--	--	--
DC-05D	DC-05D-130924	09/24/2013	N	SWI0178	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**14.6**	--	--
DC-05D	DC-05D-131211	12/11/2013	N	SWL0073	**209**	--	--	**210**	--	--	--	--	--	0.020	UJ	MSD	**81.8**	--	--	**32.3**	--	--	5.00	U	--	**28.8**	--	--	--	--	--	**16.0**	--	--
DC-05D	DC-05D-140318	03/18/2014	N	SXC0095	**209**	--	--	**210**	--	--	--	--	--	**0.182**	--	--	**86.2**	--	--	**33.4**	--	--	5.00	U	--	**29.4**	--	--	--	--	--	**12.8**	--	--
DC-05D	DC-05D-140602	06/02/2014	N	SXF0017	**214**	--	--	**215**	--	--	--	--	--	**0.163**	--	--	**67.4**	--	--	**30.6**	--	--	2.00	U	--	**24.6**	--	--	--	--	--	**3.36**	--	--
DC-05D	DC-05D-140922	09/22/2014	N	SXI0148	**203**	--	--	**205**	--	--	--	--	--	0.100	U	--	**83.3**	--	--	**30.9**	--	--	2.00	U	--	**30.2**	--	--	--	--	--	**11.7**	--	--
DC-05D	DC-05D-141216	12/16/2014	N	SXL0121	**199**	--	--	**200**	--	--	--	--	--	0.100	U	--	**78.9**	--	--	**35.9**	--	--	5.00	U	--	**29.5**	--	--	--	--	--	**7.90**	--	--
DC-05D	DC-05D-150317	03/17/2015	N	5904541	**210**	--	--	**210**	--	--	--	--	--	0.100	U	--	**78.0**	--	--	**31.0**	--	--	2.00	U	--	**29.0**	--	--	--	--	--	**7.70**	J--	MSD
DC-05D	DC-05D-150616	06/16/2015	N	59010961	**210**	--	--	**210**	--	--	--	--	--	0.100	U	--	**79.0**	--	--	**34.0**	--	--	2.00	U	--	**30.0**	--	--	--	--	--	**8.60**	--	--
DC-05D	DC-05D-150923	09/23/2015	N	59020391	**200**	--	--	**200**	--	--	--	--	--	0.100	UJ	MSD	**74.0**	--	--	**31.0**	--	--	2.00	U	--	**31.0**	--	--	--	--	--	**8.90**	J+	MSD
DC-05D	YVD-D2-150923	09/23/2015	FD	59020391	**220**	--	--	**220**	--	--	--	--	--	**0.160**	J	MSD	**73.0**	--	--	**33.0**	--	--	0.500	U	--	**30.0**	--	--	--	--	--	**10.0**	J+	MSD
DC-05D	DC-05D-151215	12/15/2015	N	59025431	**230**	J	FDP	**230**	J	FDP	--	--	--	--	R	MSD	**78.0**	--	--	**30.0**	--	--	2.00	U	--	**29.0**	--	--	--	--	--	**9.90**	--	--
DC-05D	DC-05D-160309	03/09/2016	N	59029711	**220**	--	--	**220**	--	--	--	--	--	0.100	UJ	FDP	**81.0**	--	--	**33.0**	--	--	2.00	U	--	**30.0**	--	--	--	--	--	**13.0**	--	--
DC-05D	DC-05D-160621	6/21/2016	N	59037271	**210**	--	--	**210**	--	--	--	--	--	**0.130**	J--	MSD	**78.0**	--	--	**32.0**	--	--	2.00	U	--	**30.0**	--	--	--	--	--	**12.0**	--	--
DC-05D	DC-05D-160926	9/26/2016	N	K1611506	**209**	--	--	**209**	--	--	--	--	--	0.050	U	--	**81.4**	--	--	**25.6**	--	--	**0.260**	--	--	**28.4**	--	--	--	--	--	**11.2**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-05D	DC-05D-161214	12/14/2016	N	K1615126	**202**	--	--	**202**	--	--	--	--	--	0.050	U	--	**78.1**	--	--	**25.7**	--	--	**0.280**	--	--	**27.5**	--	--	--	--	--	**11.2**	--	--
DC-05D	YVD-030717-12	3/7/2017	N	K1702324	**206**	--	--	**206**	--	--	--	--	--	1.00	U	--	**76.4**	--	--	**26.3**	--	--	**0.320**	--	--	**26.5**	--	--	--	--	--	**11.6**	J	HTQ
DC-05D	YVD-060717-34	6/7/2017	N	K1705833	**201**	--	--	**201**	--	--	--	--	--	0.050	U	--	**79.1**	--	--	**23.9**	--	--	**0.290**	--	--	**27.3**	--	--	--	--	--	**10.8**	--	--
DC-05D	YVD-092517-02	9/25/2017	N	K1710274	**207**	--	--	**207**	--	--	--	--	--	0.050	U	--	**79.2**	--	--	**25.2**	--	--	**0.280**	--	--	**28.9**	--	--	--	--	--	**11.1**	--	--
DC-05D	YVD-092517-03	9/25/2017	FD	K1710274	**207**	--	--	**207**	--	--	--	--	--	0.050	U	--	**80.6**	--	--	**24.9**	--	--	**0.270**	--	--	**29.1**	--	--	--	--	--	**11.0**	--	--
DC-05D	YVD-120517-20	12/5/2017	N	K1713091	**202**	--	--	**202**	--	--	--	--	--	0.050	U	--	**81.2**	--	--	**26.6**	--	--	**0.280**	--	--	**27.1**	--	--	--	--	--	**11.9**	J	HTQ
DC-05D	YVD-031818-08	3/18/2018	N	870610	**198**	--	--	**198**	--	--	0.070	U	--	--	--	--	**82.0**	--	--	**27.4**	--	--	**0.250**	--	--	**27.5**	--	--	--	--	--	**12.6**	--	--
DC-05D	YVD-060318-03	6/3/2018	N	874568	**203**	--	--	**203**	--	--	0.080	U	FBK	--	--	--	**78.5**	--	--	**27.4**	--	--	**0.350**	--	--	**28.0**	--	--	--	--	--	**12.5**	--	--
DC-05D	YVD-060318-05	6/3/2018	FD	874568	**202**	--	--	**202**	--	--	0.070	U	--	--	--	--	**78.5**	--	--	**27.4**	--	--	**0.260**	--	--	**28.0**	--	--	--	--	--	**13.4**	--	--
DC-05D	YVD-090918-02	9/9/2018	N	880601	**204**	--	--	**204**	--	--	0.070	U	--	--	--	--	**79.5**	--	--	**26.8**	--	--	**0.250**	--	--	**26.8**	--	--	--	--	--	**12.2**	--	--
DC-05D	YVD-121118-14	12/11/2018	N	884939	**204**	--	--	**204**	--	--	0.070	U	--	--	--	--	**78.5**	--	--	**25.7**	--	--	**0.240**	--	--	**26.5**	--	--	--	--	--	**12.4**	--	--
DC-05D	YVD-031719-04	3/17/2019	N	988239	**204**	--	--	**204**	--	--	0.070	U	--	--	--	--	**79.0**	--	--	**26.6**	--	--	0.220	U	FBK	**26.9**	--	--	--	--	--	**12.8**	--	--
DC-05D	YVD-031719-06	3/17/2019	FD	988239	**206**	--	--	**206**	--	--	0.070	U	--	--	--	--	**81.5**	--	--	**26.4**	--	--	0.220	U	FBK	**27.1**	--	--	--	--	--	**12.6**	--	--
DC-05D	YVD-060219-10	6/2/2019	N	991939	**206**	--	--	**206**	--	--	0.070	U	--	--	--	--	**78.0**	--	--	26.0	U	FBK	0.250	U	FBK	**26.7**	--	--	--	--	--	**13.8**	--	--
DC-05D	YVD-090919-12	9/9/2019	N	998357	**205**	--	--	**205**	--	--	0.070	U	--	--	--	--	**78.5**	--	--	**26.5**	--	--	**0.300**	--	--	**26.2**	--	--	--	--	--	**12.5**	--	--
DC-05D	YVD-120919-05	12/9/2019	N	902276	**201**	--	--	**201**	--	--	0.070	U	--	--	--	--	**76.5**	--	--	**26.3**	--	--	**0.280**	--	--	**26.2**	--	--	--	--	--	**12.9**	--	--
DC-05D	YVD-033020-14	3/30/2020	N	006241	**202**	--	--	**202**	--	--	0.070	U	--	--	--	--	**75.5**	--	--	**27.3**	--	--	**0.250**	--	--	**26.3**	--	--	--	--	--	**12.8**	--	--
DC-05D	YVD-060820-02	6/8/2020	N	009144	**202**	--	--	**202**	--	--	0.070	U	--	--	--	--	**76.5**	--	--	**26.9**	--	--	**0.200**	--	--	**26.6**	--	--	--	--	--	**14.4**	--	--
DC-05D	YVD-060820-04	6/8/2020	FD	009144	**202**	--	--	**202**	--	--	0.070	U	--	--	--	--	**76.0**	--	--	**26.9**	--	--	**0.200**	--	--	**26.6**	--	--	--	--	--	**12.0**	--	--
DC-05D	YVD-092020-04	9/20/2020	N	013864/20I0421	**202**	--	--	**202**	--	--	0.070	U	--	--	--	--	**78.0**	--	--	**27.2**	--	--	**0.210**	--	--	**27.0**	--	--	--	--	--	**12.0**	--	--
DC-05D	YVD-092020-05	9/20/2020	FD	013864/20I0421	**202**	--	--	**202**	--	--	0.070	U	--	--	--	--	**78.5**	--	--	**27.2**	--	--	**0.220**	--	--	**26.8**	--	--	--	--	--	**12.0**	--	--
DC-05D	YVD-120720-02	12/7/2020	N	017035	**200**	--	--	**200**	--	--	0.070	U	--	--	--	--	**77.5**	--	--	**23.5**	--	--	**0.200**	--	--	**27.1**	--	--	--	--	--	**12.9**	--	--
DC-05D	YVD-120720-04	12/7/2020	FD	017035	**198**	--	--	**198**	--	--	0.070	U	--	--	--	--	**76.5**	--	--	**21.0**	--	--	**0.180**	--	--	**26.9**	--	--	--	--	--	**12.9**	--	--
DC-05D	YVD-030221-18	3/2/2021	N	120034	**206**	--	--	**206**	--	--	0.070	U	--	--	--	--	**80.5**	--	--	**27.9**	--	--	**0.230**	--	--	**27.1**	--	--	--	--	--	**12.8**	--	--
DC-05D	YVD-060721-13	6/7/2021	N	124105	**212**	--	--	**212**	--	--	0.070	U	--	--	--	--	**78.0**	--	--	**27.2**	--	--	**0.220**	--	--	**26.9**	--	--	--	--	--	**13.0**	--	--
DC-05D	YVD-121421-04	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**12.7**	J	HTQ, MS
DC-05D	YVD-031422-02	3/14/2022	N	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**14.2**	--	--
DC-05D	YVD-031422-03	3/14/2022	FD	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**14.2**	--	--
DC-05D	YVD-060522-04	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**9.83**	--	--
DC-05D	YVD-091322-03	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**9.30**	--	--
DC-05D	YVD-120622-04	12/6/2022	N	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**9.80**	--	--
DC-05D	YVD-030623-22	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**10.1**	--	--	--	--	--
DC-05D	YVD-062023-10	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**11.2**	J	HTQ
DC-05D	YVD-091123-18	9/11/2023	N	K2310209	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**11.4**	J	HTQ
DC-07	DC-07-130103	01/03/2013	N	EPA01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**2.80**	--	--
DC-07	DC-07-130918	09/18/2013	N	SWI0123	**315**	--	--	**315**	--	--	--	--	--	0.100	U	--	**122**	--	--	**30.5**	--	--	5.00	U	--	**18.4**	--	--	--	--	--	**4.30**	--	--
DC-07	YVD-D1-130918	09/18/2013	FD	SWI0123	**295**	--	--	**295**	--	--	--	--	--	0.100	U	--	**122**	--	--	**32.8**	--	--	5.00	U	--	**18.5**	--	--	--	--	--	**4.30**	--	--
DC-07	DC-07-131210	12/10/2013	N	SWL0055	**260**	--	--	**260**	--	--	--	--	--	0.020	UJ	MSD	**27.5**	--	--	**31.0**	--	--	5.00	U	--	**11.5**	--	--	--	--	--	**4.70**	--	--
DC-07	DC-07-140316	03/16/2014	N	SXC0081	**260**	--	--	**260**	--	--	--	--	--	**0.116**	--	--	**88.4**	--	--	**26.5**	--	--	2.00	U	--	**15.4**	--	--	--	--	--	**4.72**	--	--
DC-07	DC-07-140602	06/02/2014	N	SXF0008	**245**	--	--	**245**	--	--	--	--	--	0.100	U	--	**93.7**	--	--	**28.2**	--	--	2.00	U	--	**16.5**	--	--	--	--	--	0.800	U	--
DC-07	DC-07-140922	09/22/2014	N	SXI0148	**215**	--	--	**215**	--	--	--	--	--	0.100	U	--	**87.1**	--	--	**29.8**	--	--	2.00	U	--	**16.1**	--	--	--	--	--	**4.88**	--	--
DC-07	DC-07-141216	12/16/2014	N	SXL0108	**210**	--	--	**210**	--	--	--	--	--	0.100	U	--	**83.6**	--	--	**24.2**	--	--	2.00	U	--	**15.1**	--	--	--	--	--	**2.80**	--	--
DC-07	YVD-D2-141216	12/16/2014	FD	SXL0108	**210**	--	--	**210**	--	--	--	--	--	0.100	U	--	**84.2**	--	--	**25.6**	--	--	0.500	U	--	**15.1**	--	--	--	--	--	**2.92**	--	--
DC-07	DC-07-150317	03/17/2015	N	5904541	**240**	--	--	**240**	--	--	--	--	--	0.100	U	--	**94.0**	--	--	**29.0**	--	--	2.00	U	--	**17.0**	--	--	--	--	--	**4.60**	J--	MSD
DC-07	DC-07-150617	06/17/2015	N	59011021	**230**	--	--	**230**	--	--	--	--	--	0.100	U	--	**97.0**	--	--	**32.0**	--	--	2.00	U	--	**17.0**	J	RPD	--	--	--	**4.00**	J--	MSD
DC-07	DC-07-150924	09/24/2015	N	59020391	**240**	--	--	**240**	--	--	--	--	--	0.100	UJ	MSD	**76.0**	--	--	**30.0**	--	--	2.00	U	--	**15.0**	--	--	--	--	--	**2.70**	J+	MSD
DC-07	DC-07-151215	12/15/2015	N	59025501	**240**	--	--	**240**	--	--	--	--	--	--	R	MSD	**87.0**	--	--	**29.0**	--	--	2.00	U	--	**16.0**	--	--	--	--	--	**2.50**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-07	DC-07-160309	03/09/2016	N	59029941	**280**	--	--	**280**	--	--	--	--	--	0.100	U	--	**91.0**	--	--	**31.0**	--	--	2.00	U	--	**17.0**	--	--	--	--	--	**2.20**	--	--
DC-07	DC-07-160621	6/21/2016	N	59037271	**250**	--	--	**250**	--	--	--	--	--	**0.100**	J--	MSD	**96.0**	--	--	**33.0**	--	--	2.00	U	--	**18.0**	--	--	--	--	--	**4.80**	--	--
DC-07	DC-07-160926	9/26/2016	N	K1611565	**204**	--	--	**204**	--	--	--	--	--	0.050	U	--	**82.3**	--	--	**24.4**	--	--	0.200	U	--	**15.0**	--	--	--	--	--	**2.74**	--	--
DC-07	DC-07-161214	12/14/2016	N	K1615083	**218**	--	--	**218**	--	--	--	--	--	0.050	U	--	**77.0**	--	--	**19.2**	--	--	0.200	U	--	**13.1**	--	--	--	--	--	**1.44**	--	--
DC-07	YVD-030917-25	3/9/2017	N	K1702448	**255**	--	--	**255**	--	--	--	--	--	0.050	U	--	**87.9**	--	--	**21.4**	--	--	0.200	U	--	**14.4**	--	--	--	--	--	**2.58**	--	--
DC-07	YVD-060617-18	6/6/2017	N	K1705754	**232**	--	--	**232**	--	--	--	--	--	0.050	U	--	**82.8**	--	--	**24.5**	--	--	**0.110**	J	--	**14.3**	--	--	--	--	--	**2.42**	--	--
DC-07	YVD-092517-12	9/25/2017	N	K1710333	**235**	--	--	**235**	--	--	--	--	--	0.050	U	--	**86.1**	--	--	**25.4**	--	--	**0.090**	J	--	**13.9**	--	--	--	--	--	**2.34**	--	--
DC-07	YVD-120417-14	12/4/2017	N	K1713026	**221**	--	--	**221**	--	--	--	--	--	0.050	U	--	**80.9**	--	--	**25.7**	--	--	**0.180**	J	--	**13.3**	--	--	--	--	--	**2.92**	--	--
DC-07	YVD-060318-17	6/3/2018	N	874568	**202**	--	--	**202**	--	--	0.070	U	--	--	--	--	**90.5**	--	--	**28.5**	--	--	0.100	U	--	**15.9**	--	--	--	--	--	**6.90**	--	--
DC-07	YVD-060319-20	6/3/2019	N	992053	**349**	--	--	**349**	--	--	0.070	U	--	--	--	--	**120**	--	--	**20.4**	--	--	0.100	U	--	**20.2**	--	--	--	--	--	**2.95**	--	--
DC-07	YVD-060920-18	6/9/2020	N	009269	**468**	--	--	**468**	--	--	0.070	U	--	--	--	--	**174**	--	--	**48.8**	--	--	0.100	U	--	**27.0**	--	--	--	--	--	**10.1**	--	--
DC-07	YVD-092120-22	9/21/2020	N	013896	**500**	--	--	**500**	--	--	0.070	U	--	--	--	--	**194**	--	--	**62.3**	--	--	0.100	U	--	**29.0**	--	--	--	--	--	**26.5**	--	--
DC-07	YVD-120820-22	12/8/2020	N	017137	**507**	--	--	**507**	--	--	0.070	U	--	--	--	--	**172**	--	--	**40.6**	--	--	**0.110**	--	--	**26.0**	--	--	--	--	--	**13.4**	--	--
DC-07	YVD-030121-10	3/1/2021	N	119931	**500**	--	--	**500**	--	--	0.070	U	--	--	--	--	**169**	--	--	**35.1**	--	--	0.100	U	--	**26.6**	--	--	--	--	--	**5.80**	--	--
DC-07	YVD-060721-16	6/7/2021	N	124105	**490**	--	--	**490**	--	--	0.070	U	--	--	--	--	**152**	--	--	**23.1**	--	--	0.100	U	--	**23.6**	--	--	--	--	--	**8.80**	--	--
DC-07	YVD-060721-17	6/7/2021	FD	124105	**490**	--	--	**490**	--	--	0.070	U	--	--	--	--	**150**	--	--	**23.2**	--	--	0.100	U	--	**23.4**	--	--	--	--	--	**9.90**	--	--
DC-07	YVD-121521-17	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**20.3**	J	HTQ, MS
DC-07	YVD-031522-13	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**20.1**	--	--
DC-07	YVD-060522-08	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**28.5**	--	--
DC-07	YVD-091422-16	9/14/2022	N	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**18.3**	--	--
DC-07	YVD-091422-17	9/14/2022	FD	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**18.5**	--	--
DC-07	YVD-122722-23	12/27/2022	N	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**6.20**	--	--
DC-07	YVD-030623-12	3/6/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**6.22**	--	--	--	--	--
DC-07	YVD-062123-27	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**2.50**	J	HTQ
DC-07	YVD-091123-14	9/11/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**4.40**	--	--
DC-09	DC-09-130103	01/03/2013	N	EPA01	--	--	--	--	--	--	--	--	--	0.100	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**6.00**	--	--
DC-09	DC-09-130923	09/23/2013	N	SWI0178	**44.7**	--	--	**45.0**	--	--	--	--	--	0.100	U	--	**34.0**	--	--	--	--	--	--	--	--	**8.41**	--	--	--	--	--	--	--	--
DC-09	DC-09-130926	09/26/2013	N	SWI0190	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**16.2**	--	--	0.500	U	--	--	--	--	--	--	--	**6.02**	--	--
DC-09	DC-09-131211	12/11/2013	N	SWL0063	**129**	--	--	**130**	--	--	--	--	--	--	R	MSD	**34.8**	--	--	**17.4**	--	--	0.500	U	--	**7.89**	--	--	--	--	--	**6.78**	--	--
DC-09	DC-09-140317	03/17/2014	N	SXC0095	**144**	--	--	**145**	--	--	--	--	--	0.100	U	--	**35.4**	--	--	**15.6**	--	--	**0.820**	--	--	**8.43**	--	--	--	--	--	**5.85**	--	--
DC-09	DC-09-140602	06/02/2014	N	SXF0008	**129**	--	--	**130**	--	--	--	--	--	**0.106**	--	--	**33.9**	--	--	**15.9**	--	--	0.500	U	--	**8.27**	--	--	--	--	--	**6.18**	--	--
DC-09	YVD-D3-140602	06/02/2014	FD	SXF0008	**129**	--	--	**130**	--	--	--	--	--	0.100	U	--	**34.2**	--	--	**15.8**	--	--	0.500	U	--	**8.73**	--	--	--	--	--	**5.97**	--	--
DC-09	DC-09-140923	09/23/2014	N	SXI0158	**124**	--	--	**125**	--	--	--	--	--	--	R	MSD	**32.2**	--	--	**15.8**	--	--	0.500	U	--	**6.75**	--	--	--	--	--	**6.01**	--	--
DC-09	DC-09-141216	12/16/2014	N	SXL0108	**129**	--	--	**130**	--	--	--	--	--	0.100	U	--	**35.3**	--	--	**16.3**	--	--	0.500	U	--	**7.98**	--	--	--	--	--	**5.94**	--	--
DC-09	DC-09-150316	03/16/2015	N	5904541	**130**	--	--	**130**	--	--	--	--	--	**0.150**	--	--	**36.0**	--	--	**17.0**	--	--	**0.600**	--	--	**8.00**	--	--	--	--	--	**5.90**	J--	MSD
DC-09	DC-09-150616	06/16/2015	N	59010751	**130**	--	--	**130**	--	--	--	--	--	0.100	U	--	**34.0**	J+	MSD	**16.0**	--	--	0.500	U	--	**8.10**	J+	MSD	--	--	--	**5.80**	--	--
DC-09	DC-09-150923	09/23/2015	N	59020281	**140**	--	--	**140**	--	--	--	--	--	0.100	U	--	**33.0**	--	--	**16.0**	--	--	0.500	U	--	**8.10**	--	--	--	--	--	**5.80**	--	--
DC-09	DC-09-151214	12/14/2015	N	59025431	**150**	J	FDP	**150**	J	FDP	--	--	--	--	R	MSD	**34.0**	--	--	**16.0**	--	--	0.500	U	--	**8.20**	--	--	--	--	--	**5.90**	--	--
DC-09	DC-09-160308	03/08/2016	N	59029711	**130**	--	--	**130**	--	--	--	--	--	--	R	FBK, FDP	**35.0**	--	--	**16.0**	--	--	0.500	U	--	**8.80**	--	--	--	--	--	**5.70**	--	--
DC-09	YVD-D2-160308	03/08/2016	FD	59029711	**130**	--	--	**130**	--	--	--	--	--	0.100	UJ	FDP	**34.0**	--	--	**16.0**	--	--	0.500	U	--	**8.60**	--	--	--	--	--	**5.70**	--	--
DC-09	DC-09-160621	6/21/2016	N	59037151	**130**	--	--	**130**	--	--	--	--	--	0.100	UJ	--	**32.0**	--	--	**17.0**	--	--	**0.510**	--	--	**7.50**	--	--	--	--	--	**5.90**	--	--
DC-09	DC-09-160929	9/29/2016	N	K1611704	**129**	--	--	**129**	--	--	--	--	--	0.050	U	MBK	**30.6**	--	--	**14.8**	--	--	**0.380**	--	--	**6.25**	--	--	--	--	--	**5.53**	--	--
DC-09	DC-09-D4-160929	9/29/2016	FD	K1611704	**128**	--	--	**128**	--	--	--	--	--	0.050	U	MBK	**30.4**	--	--	**14.9**	--	--	**0.380**	--	--	**6.22**	--	--	--	--	--	**5.53**	--	--
DC-09	DC-09-161215	12/15/2016	N	K1615126	**127**	--	--	**127**	--	--	--	--	--	0.050	U	--	**33.0**	--	--	**15.0**	--	--	**0.410**	--	--	**6.65**	--	--	--	--	--	**5.62**	--	--
DC-09	YVD-D4-161215	12/15/2016	FD	K1615126	**127**	--	--	**127**	--	--	--	--	--	0.050	U	--	**32.8**	--	--	**15.0**	--	--	**0.420**	--	--	**6.62**	--	--	--	--	--	**5.61**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-09	YVD-031317-36	3/13/2017	N	K1702489	**124**	--	--	**124**	--	--	--	--	--	0.050	U	--	**33.8**	--	--	**14.6**	--	--	**0.440**	--	--	**6.75**	--	--	--	--	--	**5.54**	--	--
DC-09	YVD-060717-27	6/7/2017	N	K1705833	**126**	--	--	**126**	--	--	--	--	--	0.050	U	--	**33.3**	--	--	**14.7**	--	--	**0.400**	--	--	**6.88**	--	--	--	--	--	**5.55**	--	--
DC-09	YVD-092617-23	9/26/2017	N	K1710333	**132**	--	--	**132**	--	--	--	--	--	0.050	U	--	**32.9**	--	--	**14.7**	--	--	**0.400**	--	--	**6.71**	--	--	--	--	--	**5.47**	--	--
DC-09	YVD-120417-09	12/4/2017	N	K1713026	**129**	--	--	**129**	--	--	--	--	--	0.050	U	--	**33.0**	--	--	**15.1**	--	--	**0.430**	--	--	**6.50**	--	--	--	--	--	**5.80**	--	--
DC-09	YVD-060418-25	6/4/2018	N	874860	**127**	--	--	**127**	--	--	0.070	U	--	--	--	--	**33.4**	--	--	**14.1**	--	--	**0.390**	--	--	**7.30**	--	--	--	--	--	**5.29**	--	--
DC-09	YVD-060319-19	6/3/2019	N	992053	**128**	--	--	**128**	--	--	0.070	U	--	--	--	--	**34.5**	--	--	**13.1**	--	--	**0.390**	--	--	**7.25**	--	--	--	--	--	**5.23**	--	--
DC-09	YVD-060920-25	6/9/2020	N	009269	**128**	--	--	**128**	--	--	0.070	U	--	--	--	--	**34.0**	--	--	**14.4**	--	--	**0.350**	--	--	**7.15**	--	--	--	--	--	**5.60**	--	--
DC-09	YVD-060721-15	6/7/2021	N	124105	**129**	--	--	**129**	--	--	0.070	U	--	--	--	--	**34.4**	--	--	**14.8**	--	--	**0.380**	--	--	**7.35**	--	--	--	--	--	**6.20**	--	--
DC-09	YVD-060722-29	6/7/2022	N	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**6.76**	J	HTQ
DC-09	YVD-062123-22	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**6.23**	J	HTQ
DC-09	YVD-062123-23	6/21/2023	FD	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**5.92**	J	HTQ
DC-14	DC-14-130103	01/03/2013	N	EPA01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**26.0**	--	--
DC-14	DC-14-130917	09/17/2013	N	SWI0113	**454**	--	--	**455**	--	--	--	--	--	**0.115**	--	--	**121**	--	--	**80.2**	--	--	0.500	U	--	**32.3**	--	--	--	--	--	**12.0**	--	--
DC-14	DC-14-131211	12/11/2013	N	SWL0063	**434**	--	--	**435**	--	--	--	--	--	--	R	MSD	**91.2**	--	--	**64.4**	--	--	5.00	U	--	**23.9**	--	--	--	--	--	**5.80**	--	--
DC-14	DC-14-140318	03/18/2014	N	SXC0095	**494**	--	--	**495**	--	--	--	--	--	0.100	U	--	**107**	--	--	**71.8**	--	--	5.00	U	--	**28.4**	--	--	--	--	--	**10.6**	--	--
DC-14	DC-14-140602	06/02/2014	N	SXF0017	**425**	--	--	**425**	--	--	--	--	--	0.100	U	--	**95.9**	--	--	**56.1**	--	--	1.00	U	--	**26.3**	--	--	--	--	--	**6.46**	--	--
DC-14	DC-14-140923	09/23/2014	N	SXI0158	**424**	--	--	**425**	--	--	--	--	--	--	R	MSD	**106**	--	--	**63.7**	--	--	1.00	U	--	**27.6**	--	--	--	--	--	**8.90**	--	--
DC-14	DC-14-141216	12/16/2014	N	SXL0108	**429**	--	--	**430**	--	--	--	--	--	0.100	U	--	**110**	--	--	**74.4**	--	--	1.00	U	--	**31.5**	--	--	--	--	--	**10.4**	--	--
DC-14	DC-14-150316	03/16/2015	N	5904541	**490**	--	--	**490**	--	--	--	--	--	**0.160**	--	--	**140**	--	--	**80.0**	--	--	1.00	U	--	**38.0**	--	--	--	--	--	**18.0**	J--	MSD
DC-14	DC-14-150616	06/16/2015	N	59010961	**430**	--	--	**430**	--	--	--	--	--	0.100	U	--	**120**	--	--	**76.0**	--	--	1.00	U	--	**33.0**	--	--	--	--	--	**12.0**	--	--
DC-14	DC-14-150924	09/24/2015	N	59020391	**470**	--	--	**470**	--	--	--	--	--	0.100	UJ	MSD	**130**	--	--	**96.0**	--	--	1.00	U	--	**42.0**	--	--	--	--	--	**22.0**	J+	MSD
DC-14	DC-14-151214	12/14/2015	N	59025351	**550**	--	--	**550**	--	--	--	--	--	--	R	MSD	**150**	--	--	**90.0**	--	--	1.00	U	--	**43.0**	--	--	--	--	--	**21.0**	--	--
DC-14	YVD-D1-151214	12/14/2015	FD	59025351	**540**	--	--	**540**	--	--	--	--	--	--	R	MSD	**150**	--	--	**85.0**	--	--	0.500	U	--	**43.0**	--	--	--	--	--	**22.0**	--	--
DC-14	DC-14-160309	03/09/2016	N	59029711	**490**	--	--	**490**	--	--	--	--	--	0.100	UJ	FDP	**130**	--	--	**82.0**	--	--	1.00	U	--	**38.0**	--	--	--	--	--	**16.0**	--	--
DC-14	DC-14-160620	6/20/2016	N	59037151	**460**	--	--	**460**	--	--	--	--	--	0.100	U	--	**120**	--	--	**75.0**	--	--	1.00	U	--	**36.0**	--	--	--	--	--	**16.0**	--	--
DC-14	DC-14-160929	9/29/2016	N	K1611704	**394**	--	--	**394**	--	--	--	--	--	0.050	U	MBK	**97.2**	--	--	**56.4**	--	--	**0.300**	--	--	**28.9**	--	--	--	--	--	**7.19**	--	--
DC-14	DC-14-161216	12/16/2016	N	K1615174	**361**	--	--	**361**	--	--	--	--	--	0.050	U	--	**93.3**	--	--	**53.9**	--	--	**0.360**	--	--	**22.3**	--	--	--	--	--	**4.45**	--	--
DC-14	YVD-031317-38	3/14/2017	N	K1702542	**359**	--	--	**359**	--	--	--	--	--	0.050	U	--	**91.0**	--	--	**49.6**	--	--	**0.340**	--	--	**24.4**	--	--	--	--	--	**4.34**	--	--
DC-14	YVD-060617-19	6/6/2017	N	K1705754	**386**	--	--	**386**	--	--	--	--	--	0.050	U	--	**97.7**	--	--	**49.2**	--	--	**0.340**	--	--	**24.4**	--	--	--	--	--	**3.86**	--	--
DC-14	YVD-092517-11	9/25/2017	N	K1710274	**382**	--	--	**382**	--	--	--	--	--	0.050	U	--	**98.2**	--	--	**43.3**	--	--	**0.340**	--	--	**24.5**	--	--	--	--	--	**2.41**	--	--
DC-14	YVD-120617-27	12/6/2017	N	K1713157	**378**	--	--	**378**	--	--	--	--	--	0.050	U	MBK	**100**	--	--	**46.4**	--	--	**0.350**	--	--	**23.5**	--	--	--	--	--	**2.52**	--	--
DC-14	YVD-120617-29	12/6/2017	FD	K1713157	**372**	--	--	**372**	--	--	--	--	--	0.050	U	--	**97.7**	--	--	**46.0**	--	--	**0.340**	--	--	**22.8**	--	--	--	--	--	**2.52**	--	--
DC-14	YVD-031918-20	3/19/2018	N	870634	**372**	--	--	**372**	--	--	0.070	U	--	--	--	--	**95.0**	--	--	**47.9**	--	--	**0.310**	--	--	**22.6**	--	--	--	--	--	**2.86**	--	--
DC-14	YVD-060518-28	6/5/2018	N	874860	**370**	--	--	**370**	--	--	0.070	U	--	--	--	--	**92.0**	--	--	**56.5**	--	--	**0.310**	--	--	**23.5**	--	--	--	--	--	**4.00**	--	--
DC-14	YVD-060518-30	6/5/2018	FD	874860	--	R	PRS	--	R	PRS	0.070	U	--	--	--	--	**97.5**	--	--	--	R	PRS	--	R	PRS	**24.6**	--	--	--	--	--	--	R	PRS
DC-14	YVD-090918-08	9/9/2018	N	880601	**368**	--	--	**368**	--	--	0.070	U	--	--	--	--	**104**	--	--	**63.5**	--	--	**0.290**	--	--	**25.0**	--	--	--	--	--	**4.08**	--	--
DC-14	YVD-090918-10	9/9/2018	FD	880601	**363**	--	--	**363**	--	--	0.070	U	--	--	--	--	**105**	--	--	**70.8**	--	--	**0.290**	--	--	**25.1**	--	--	--	--	--	**4.00**	--	--
DC-14	YVD-121018-07	12/10/2018	N	884857	**376**	--	--	**376**	--	--	0.070	U	--	--	--	--	**105**	--	--	**72.8**	--	--	0.280	U	FBK	**25.7**	J	MSD	--	--	--	**4.60**	--	--
DC-14	YVD-031719-09	3/17/2019	N	988239	**395**	--	--	**395**	--	--	0.070	U	--	--	--	--	**118**	--	--	**83.8**	--	--	0.250	U	FBK	**27.8**	--	--	--	--	--	**5.00**	--	--
DC-14	YVD-060319-17	6/3/2019	N	992053	**395**	--	--	**395**	--	--	0.070	U	--	--	--	--	**122**	--	--	**79.7**	--	--	**0.220**	--	--	**29.7**	--	--	--	--	--	**5.35**	--	--
DC-14	YVD-091019-18	9/10/2019	N	998438	**427**	--	--	**427**	--	--	0.070	U	--	--	--	--	**132**	--	--	**89.5**	--	--	**0.240**	--	--	**32.3**	--	--	--	--	--	**7.70**	--	--
DC-14	YVD-120919-14	12/9/2019	N	902276	**438**	--	--	**438**	--	--	0.070	U	--	--	--	--	**134**	--	--	**95.2**			**0.320**			**32.9**	--	--	--	--	--	**8.00**	--	--
DC-14	YVD-033120-19	3/31/2020	N	006260	**451**	--	--	**451**	--	--	0.070	U	--	--	--	--	**134**	--	--	**87.6**	--	--	**0.240**	--	--	**32.5**	--	--	--	--	--	**9.50**	--	--
DC-14	YVD-033120-21	3/31/2020	FD	006260	**448**	--	--	**448**	--	--	0.070	U	--	--	--	--	**136**	--	--	**87.7**	--	--	**0.260**	--	--	**33.1**	--	--	--	--	--	**9.60**	--	--
DC-14	YVD-061020-32	6/10/2020	N	009361	**437**	--	--	**437**	--	--	0.070	U	--	--	--	--	**138**	--	--	**84.9**	--	--	**0.230**	--	--	**33.7**	J	MS	--	--	--	**11.5**	--	--
DC-14	YVD-061020-33	6/10/2020	FD	009361	**461**	--	--	**461**	--	--	0.070	U	--	--	--	--	**139**	--	--	**87.3**	--	--	**0.220**	--	--	**33.3**	J	MS	--	--	--	**12.0**	--	--
DC-14	YVD-092120-23	9/21/2020	N	013896	**472**	--	--	**472**	--	--	0.070	U	--	--	--	--	**150**	--	--	**90.5**	--	--	**0.210**	--	--	**36.1**	--	--	--	--	--	**17.3**	--	--
DC-14	YVD-120820-21	12/8/2020	N	017137	**496**	--	--	**496**	--	--	0.070	U	--	--	--	--	**174**	--	--	**89.4**	--	--	**0.180**	--	--	**41.5**	--	--	--	--	--	**23.6**	--	--
DC-14	YVD-030121-09	3/1/2021	N	119931	**517**	--	--	**517**	--	--	0.070	U	--	--	--	--	**186**	--	--	**90.9**	--	--	**0.240**	--	--	**44.3**	--	--	--	--	--	**31.2**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-14	YVD-060821-33	6/8/2021	N	124212	**563**	--	--	**563**	--	--	0.070	U	--	--	--	--	**196**	--	--	**93.4**	--	--	**0.140**	--	--	**47.1**	--	--	--	--	--	**40.2**	--	--
DC-14	YVD-121521-19	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**51.4**	J	HTQ, MS
DC-14	YVD-031522-16	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**48.8**	--	--
DC-14	YVD-060722-28	6/7/2022	N	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**57.4**	J	HTQ
DC-14	YVD-091422-18	9/14/2022	N	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**55.0**	--	--
DC-14	YVD-122822-24	12/28/2022	N	K2215296	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**55.7**	--	--
DC-14	YVD-030623-16	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**52.0**	--	--	--	--	--
DC-14	YVD-062023-12	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**50.5**	J	HTQ
DC-14	YVD-091123-10	9/11/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**49.9**	--	--
YVD-02	YVD-02-130924	09/24/2013	N	SWI0178	**54.9**	--	--	**55.0**	--	--	--	--	--	**0.146**	--	--	**20.4**	--	--	**3.85**	--	--	0.500	U	--	**5.89**	--	--	--	--	--	**0.410**	--	--
YVD-02	YVD-02-140316	03/16/2014	N	SXC0081	**199**	--	--	**200**	--	--	--	--	--	0.100	U	--	**90.8**	--	--	**3.93**	--	--	**1.02**	--	--	**71.7**	--	--	--	--	--	0.200	U	--
YVD-02	YVD-02-140602	06/02/2014	N	SXF0008	**82.2**	--	--	**82.5**	--	--	--	--	--	0.100	U	--	**62.7**	--	--	**2.75**	--	--	0.500	U	--	**48.7**	--	--	--	--	--	0.200	U	--
YVD-02	YVD-02-140921	09/21/2014	N	SXI0148	**89.4**	--	--	**90.0**	--	--	--	--	--	0.100	U	--	**29.6**	--	--	**2.64**	--	--	0.500	U	--	**13.7**	J	FDP	--	--	--	0.200	U	--
YVD-02	YVD-D1-140921	09/21/2014	FD	SXI0148	**89.4**	--	--	**90.0**	--	--	--	--	--	0.100	U	--	**35.8**	--	--	**2.20**	--	--	0.500	U	--	**18.2**	J	FDP	--	--	--	0.200	U	--
YVD-02	YVD-02-141215	12/15/2014	N	SXL0103	**94.7**	--	--	**95.0**	--	--	--	--	--	0.100	U	--	**35.7**	--	--	**2.90**	J+	MSD	0.500	U	--	**17.4**	--	--	--	--	--	**0.220**	J	DUP
YVD-02	YVD-02-150615	06/15/2015	N	59010751	**75.0**	J+	FBK	**75.0**	J+	FBK	--	--	--	**0.110**	--	--	**32.0**	J+	MSD	**2.60**	--	--	0.500	U	--	**16.0**	J+	MSD	--	--	--	**0.230**	--	--
YVD-02	YVD-02-150923	09/23/2015	N	59020281	**95.0**	--	--	**95.0**	--	--	--	--	--	0.100	U	--	**28.0**	--	--	**2.50**	--	--	0.500	U	--	**17.0**	--	--	--	--	--	0.200	U	--
YVD-02	YVD-02-151214	12/14/2015	N	59025351	**100.0**	--	--	**100.0**	--	--	--	--	--	--	R	MSD	**38.0**	--	--	**2.60**	--	--	0.500	U	--	**23.0**	--	--	--	--	--	0.200	U	--
YVD-02	YVD-02-160308	03/08/2016	N	59029521	**110**	J	FDP	**110**	J	FDP	--	--	--	0.100	UJ	RPD	**32.0**	--	--	**3.00**	--	--	**0.570**	--	--	**20.0**	--	--	--	--	--	0.200	U	--
YVD-02	YVD-02-160620	6/20/2016	N	59037101	**75.0**	--	--	**75.0**	--	--	--	--	--	0.100	U	--	**25.0**	--	--	**2.90**	--	--	0.500	U	--	**10.0**	--	--	--	--	--	**0.310**	--	--
YVD-02	YVD-02-160928	9/28/2016	N	K1611629	**72.0**	--	--	**72.0**	--	--	--	--	--	0.050	U	MBK	**17.2**	--	--	**2.79**	J	DUP	**0.160**	J	--	**4.64**	--	--	--	--	--	**0.130**	--	--
YVD-02	YVD-030817-15	3/8/2017	N	K1702324	**103**	--	--	**103**	--	--	--	--	--	1.00	U	--	**30.2**	--	--	**3.85**	--	--	**0.210**	--	--	**7.22**	--	--	--	--	--	**5.40**	--	--
YVD-02	YVD-060617-14	6/6/2017	N	K1705754	**81.0**	--	--	**81.0**	--	--	--	--	--	0.050	U	--	**20.9**	--	--	**3.03**	--	--	**0.160**	J	--	**4.85**	--	--	--	--	--	**0.200**	--	--
YVD-02	YVD-060617-16	6/6/2017	FD	K1705754	**67.0**	--	--	**67.0**	--	--	--	--	--	0.050	U	--	**20.2**	--	--	**2.95**	--	--	**0.150**	J	--	**4.74**	--	--	--	--	--	**0.200**	--	--
YVD-02	YVD-092617-20	9/26/2017	N	K1710333	**75.0**	--	--	**75.0**	--	--	--	--	--	0.050	U	--	**17.7**	--	--	**2.63**	--	--	**0.150**	J	--	**4.64**	--	--	--	--	--	**0.170**	--	--
YVD-02	YVD-120417-02	12/4/2017	N	K1713026	**89.0**	--	--	**89.0**	--	--	--	--	--	0.050	U	--	**20.0**	--	--	**2.37**	--	--	**0.290**	--	--	**7.43**	--	--	--	--	--	**0.220**	--	--
YVD-02	YVD-120417-04	12/4/2017	FD	K1713026	**93.0**	--	--	**93.0**	--	--	--	--	--	0.050	U	--	**19.6**	--	--	**2.20**	--	--	**0.310**	--	--	**7.74**	--	--	--	--	--	**0.200**	--	--
YVD-02	YVD-061218-32	6/12/2018	N	875438	--	R	NR	--	R	NR	--	R	NR	--	--	--	--	R	NR	--	R	NR	--	R	NR	--	R	NR	--	--	--	--	R	NR
YVD-02	YVD-060419-28	6/4/2019	N	992242	**191**	--	--	**191**	--	--	0.070	U	--	--	--	--	**54.0**	--	--	**12.5**	--	--	**0.180**	--	--	**19.6**	--	--	--	--	--	**33.9**	J	HTQ
YVD-02	YVD-070219-33	7/2/2019	N	994356	**204**	--	--	**204**	--	--	0.070	U	--	--	--	--	**87.0**	--	--	**13.0**	--	--	**0.190**	--	--	**32.4**	--	--	--	--	--	**36.1**	--	--
YVD-02	YVD-091019-19	9/10/2019	N	998438	**200**	--	--	**200**	--	--	0.070	U	--	--	--	--	**97.0**	--	--	**11.3**	--	--	**0.130**	--	--	**27.0**	--	--	--	--	--	**43.6**	--	--
YVD-02	YVD-121019-23	12/10/2019	N	902321	**226**	--	--	**226**	--	--	0.070	U	--				**85.0**	--	--	**11.6**	--	--	**0.330**	--	--	**31.6**	--	--	--	--	--	**38.9**	--	--
YVD-02	YVD-040120-23	4/1/2020	N	006311	**237**	--	--	**237**	--	--	0.070	U	--	--	--	--	**59.5**	--	--	**11.7**	--	--	**0.550**	--	--	**25.4**	--	--	--	--	--	**20.6**	--	--
YVD-02	YVD-061120-35	6/11/2020	N	009430	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**15.5**	--	--
YVD-02	NS[1]	9/21/2020	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	12/8/2020	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	3/1/2021	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	6/8/2021	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	12/15/2021	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	3/15/2022	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	6/7/2022	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	9/12/2022	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	12/5/2022	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	3/6/2023	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	6/20/2023	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	9/10/2023	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-03	YVD-03-130916	09/16/2013	N	SWI0113	**209**	--	--	**210**	--	--	--	--	--	0.100	U	--	**57.5**	--	--	**14.0**	--	--	**0.740**	--	--	**24.3**	--	--	--	--	--	**4.75**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-03	YVD-03-131210	12/10/2013	N	SWL0063	**214**	--	--	**215**	--	--	--	--	--	--	R	MSD	**48.7**	--	--	**14.3**	--	--	1.00	U	--	**20.4**	--	--	--	--	--	**5.96**	--	--
YVD-03	YVD-03-140317	03/17/2014	N	SXC0081	**219**	--	--	**220**	--	--	--	--	--	**0.249**	--	--	**51.2**	--	--	**13.3**	--	--	**1.03**	--	--	**18.2**	--	--	--	--	--	**4.75**	--	--
YVD-03	YVD-03-140602	06/02/2014	N	SXF0008	**206**	--	--	**208**	--	--	--	--	--	0.100	U	--	**46.4**	--	--	**10.7**	--	--	0.500	U	--	**16.8**	--	--	--	--	--	**3.86**	--	--
YVD-03	YVD-03-140923	09/23/2014	N	SXI0158	**199**	--	--	**200**	--	--	--	--	--	--	R	MSD	**52.2**	--	--	**11.8**	--	--	**0.620**	--	--	**19.5**	--	--	--	--	--	**3.97**	--	--
YVD-03	YVD-D3-140923	09/23/2014	FD	SXI0158	**199**	--	--	**200**	--	--	--	--	--	--	R	MSD	**45.4**	--	--	**12.1**	--	--	**0.650**	--	--	**16.2**	--	--	--	--	--	**4.04**	--	--
YVD-03	YVD-03-141215	12/15/2014	N	SXL0108	**199**	--	--	**200**	--	--	--	--	--	0.100	U	--	**51.7**	--	--	**12.9**	--	--	**0.540**	--	--	**19.3**	--	--	--	--	--	**4.27**	--	--
YVD-03	YVD-03-150316	03/16/2015	N	5904541	**210**	--	--	**210**	--	--	--	--	--	0.100	U	--	**46.0**	--	--	**13.0**	--	--	**0.840**	--	--	**17.0**	--	--	--	--	--	**4.10**	J--	MSD
YVD-03	YVD-03-150616	06/16/2015	N	59010751	**200**	--	--	**200**	--	--	--	--	--	**0.120**	--	--	**50.0**	J+	MSD	**12.0**	--	--	**0.680**	--	--	**20.0**	J+	MSD	--	--	--	**4.00**	--	--
YVD-03	YVD-03-150922	09/22/2015	N	59020141	**220**	--	--	**220**	--	--	--	--	--	0.100	U	--	**43.0**	--	--	**14.0**	--	--	**0.660**	--	--	**19.0**	--	--	--	--	--	**4.90**	--	--
YVD-03	YVD-03-151214	12/14/2015	N	59025351	**230**	--	--	**230**	--	--	--	--	--	--	R	MSD	**49.0**	--	--	**14.0**	--	--	**0.740**	--	--	**22.0**	--	--	--	--	--	**4.90**	--	--
YVD-03	YVD-03-160307	03/07/2016	N	59029521	**150**	J	FDP	**150**	J	FDP	--	--	--	0.100	UJ	RPD	**43.0**	--	--	**13.0**	--	--	**0.720**	--	--	**20.0**	--	--	--	--	--	**4.60**	--	--
YVD-03	YVD-03-160620	6/20/2016	N	59037151	**190**	--	--	**190**	--	--	--	--	--	0.100	U	--	**46.0**	--	--	**14.0**	--	--	**0.760**	--	--	**21.0**	--	--	--	--	--	**4.60**	--	--
YVD-03	YVD-03-160929	9/29/2016	N	K1611758	**196**	--	--	**196**	--	--	--	--	--	0.050	U	MBK	**43.2**	--	--	**11.7**	--	--	**0.610**	--	--	**18.3**	--	--	--	--	--	**4.39**	--	--
YVD-03	YVD-03-161213	12/13/2016	N	K1615045	**189**	--	--	**189**	--	--	--	--	--	0.050	U	--	**40.0**	--	--	**11.6**	--	--	**0.690**	--	--	**17.4**	--	--	--	--	--	**4.47**	--	--
YVD-03	YVD-030617-02	3/6/2017	N	K1702228	**190**	--	--	**190**	--	--	--	--	--	0.050	U	--	**41.6**	--	--	**11.4**	--	--	**0.600**	--	--	**17.3**	--	--	--	--	--	**4.42**	--	--
YVD-03	YVD-030617-03	3/6/2017	FD	K1702228	**192**	--	--	**192**	--	--	--	--	--	0.050	U	--	**41.5**	--	--	**11.6**	--	--	**0.650**	--	--	**17.3**	--	--	--	--	--	**4.48**	--	--
YVD-03	YVD-060517-13	6/5/2017	N	K1705702	**189**	--	--	**189**	--	--	--	--	--	0.050	U	--	**41.9**	--	--	**11.9**	--	--	**0.660**	--	--	**18.1**	--	--	--	--	--	**4.61**	--	--
YVD-03	YVD-092517-05	9/25/2017	N	K1710274	**193**	--	--	**193**	--	--	--	--	--	0.050	U	--	**41.6**	--	--	**11.6**	--	--	**0.660**	--	--	**18.7**	--	--	--	--	--	**4.45**	--	--
YVD-03	YVD-120517-19	12/5/2017	N	K1713091	**181**	--	--	**181**	--	--	--	--	--	0.050	U	--	**41.9**	--	--	**11.1**	--	--	**0.640**	--	--	**17.4**	--	--	--	--	--	**4.52**	--	--
YVD-03	YVD-060518-27	6/5/2018	N	874860	**188**	--	--	**188**	--	--	0.070	U	--	--	--	--	**39.0**	--	--	**11.3**	--	--	**0.620**	--	--	**17.4**	--	--	--	--	--	**4.70**	--	--
YVD-03	YVD-060219-07	6/2/2019	N	991939	**185**	--	--	**185**	--	--	0.070	U	--	--	--	--	**40.3**	--	--	8.19	U	FBK	0.440	U	FBK	**17.2**	--	--	--	--	--	**3.16**	--	--
YVD-03	YVD-060820-09	6/8/2020	N	009144	**184**	--	--	**184**	--	--	0.070	U	--	--	--	--	**40.5**	--	--	**11.6**	--	--	**0.560**	--	--	**17.6**	--	--	--	--	--	**5.20**	--	--
YVD-03	YVD-060821-24	6/8/2021	N	124212	**182**	--	--	**182**	--	--	0.070	U	--	--	--	--	**42.2**	--	--	**8.09**	--	--	**0.370**	--	--	**17.8**	--	--	--	--	--	**3.23**	--	--
YVD-03	YVD-060822-31	6/8/2022	N	K2206299	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**5.08**	--	--
YVD-03	YVD-060822-32	6/8/2022	FD	K2206299	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**5.10**	--	--
YVD-03	YVD-061923-04	6/19/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**4.97**	J	HTQ
YVD-04	YVD-04-130916	09/16/2013	N	SWI0113	**184**	--	--	**185**	--	--	--	--	--	0.100	U	--	**37.4**	--	--	**14.9**	--	--	0.500	U	--	**11.2**	--	--	--	--	--	**4.45**	--	--
YVD-04	YVD-04-131210	12/10/2013	N	SWL0063	**203**	--	--	**205**	--	--	--	--	--	--	R	MSD	**38.2**	--	--	**15.0**	--	--	1.00	U	--	**11.7**	--	--	--	--	--	**4.64**	--	--
YVD-04	YVD-04-140317	03/17/2014	N	SXC0081	**209**	--	--	**210**	--	--	--	--	--	0.100	U	--	**37.7**	--	--	**15.1**	--	--	**0.630**	--	--	**11.6**	--	--	--	--	--	**4.03**	--	--
YVD-04	YVD-04-140602	06/02/2014	N	SXF0008	**191**	--	--	**193**	--	--	--	--	--	**0.113**	--	--	**36.8**	--	--	**14.3**	--	--	1.00	U	--	**11.5**	--	--	--	--	--	**3.78**	--	--
YVD-04	YVD-04-140923	09/23/2014	N	SXI0158	**188**	--	--	**190**	--	--	--	--	--	--	R	MSD	**37.8**	--	--	**15.3**	--	--	0.500	U	--	**11.5**	--	--	--	--	--	**3.87**	--	--
YVD-04	YVD-04-141215	12/15/2014	N	SXL0108	**188**	--	--	**190**	--	--	--	--	--	0.100	U	--	**38.8**	--	--	**15.2**	--	--	0.500	U	--	**12.4**	--	--	--	--	--	**3.81**	--	--
YVD-04	YVD-04-150315	03/15/2015	N	5904471	**190**	--	--	**190**	--	--	--	--	--	0.100	U	--	**38.0**	--	--	**16.0**	--	--	0.500	U	--	**12.0**	--	--	--	--	--	**4.30**	--	--
YVD-04	YVD-04-150615	06/15/2015	N	59010751	**190**	--	--	**190**	--	--	--	--	--	0.100	U	--	**38.0**	J+	MSD	**15.0**	--	--	0.500	U	--	**8.50**	J+	MSD	--	--	--	**4.00**	--	--
YVD-04	YVD-04-150922	09/22/2015	N	59020141	**200**	--	--	**200**	--	--	--	--	--	**0.130**	--	--	**36.0**	--	--	**15.0**	--	--	0.500	U	--	**11.0**	--	--	--	--	--	**3.90**	--	--
YVD-04	YVD-04-151213	12/13/2015	N	59025351	**200**	--	--	**200**	--	--	--	--	--	--	R	MSD	**39.0**	--	--	**15.0**	--	--	0.500	U	--	**12.0**	--	--	--	--	--	**4.10**	--	--
YVD-04	YVD-04-160307	03/07/2016	N	59029521	**250**	J	FDP	**250**	J	FDP	--	--	--	0.100	UJ	RPD	**36.0**	--	--	**14.0**	--	--	0.500	U	--	**12.0**	--	--	--	--	--	**3.70**	--	--
YVD-04	YVD-04-160620	6/20/2016	N	59037101	**190**	--	--	**190**	--	--	--	--	--	0.100	U	--	**36.0**	--	--	**15.0**	--	--	0.500	U	--	**12.0**	--	--	--	--	--	**4.00**	--	--
YVD-04	YVD-D1-160620	6/20/2016	FD	59037101	**180**	--	--	**180**	--	--	--	--	--	0.100	U	--	**35.0**	--	--	**15.0**	--	--	0.500	U	--	**12.0**	--	--	--	--	--	**4.00**	--	--
YVD-04	YVD-04-160928	9/28/2016	N	K1611629	**187**	--	--	**187**	--	--	--	--	--	0.050	U	--	**34.7**	--	--	**13.2**	--	--	**0.210**	--	--	**10.7**	--	--	--	--	--	**3.67**	--	--
YVD-04	YVD-04-D3-160928	9/28/2016	FD	K1611629	**185**	--	--	**185**	--	--	--	--	--	0.050	U	MBK	**34.7**	--	--	**13.2**	--	--	**0.200**	--	--	**10.9**	--	--	--	--	--	**3.68**	--	--
YVD-04	YVD-04-161213	12/13/2016	N	K1615045	**181**	--	--	**181**	--	--	--	--	--	0.050	U	--	**35.2**	--	--	**13.2**	--	--	**0.230**	--	--	**10.9**	--	--	--	--	--	**3.74**	--	--
YVD-04	YVD-031017-28	3/10/2017	N	K1702448	**167**	--	--	**167**	--	--	--	--	--	0.050	U	--	**37.8**	--	--	**13.2**	--	--	**0.210**	--	--	**10.9**	--	--	--	--	--	**3.70**	--	--
YVD-04	YVD-060517-11	6/5/2017	N	K1705702	**182**	--	--	**182**	--	--	--	--	--	0.050	U	--	**36.5**	--	--	**13.0**	--	--	**0.220**	--	--	**9.85**	--	--	--	--	--	**3.53**	--	--
YVD-04	YVD-092517-07	9/25/2017	N	K1710274	**188**	--	--	**188**	--	--	--	--	--	0.050	U	--	**37.2**	--	--	**12.9**	--	--	**0.210**	--	--	**11.7**	--	--	--	--	--	**3.57**	--	--
YVD-04	YVD-120417-13	12/4/2017	N	K1713091	**185**	--	--	**185**	--	--	--	--	--	0.050	U	--	**36.5**	--	--	**13.2**	--	--	**0.240**	--	--	**10.9**	--	--	--	--	--	**3.79**	--	--
YVD-04	YVD-060418-21	6/4/2018	N	874662	**179**	--	--	**179**	--	--	0.080	U	FBK	--	--	--	**37.0**	--	--	**12.3**	--	--	**0.190**	--	--	**11.7**	--	--	--	--	--	**4.10**	--	--
YVD-04	YVD-060219-05	6/2/2019	N	991939	**181**	--	--	**181**	--	--	0.070	U	--	--	--	--	**36.2**	--	--	22.9	U	FBK	0.790	U	FBK	**11.1**	--	--	--	--	--	**3.85**	--	--
YVD-04	YVD-060820-05	6/8/2020	N	009144	**182**	--	--	**182**	--	--	0.070	U	--	--	--	--	**34.9**	--	--	**12.7**	--	--	**0.160**	--	--	**10.9**	--	--	--	--	--	**4.10**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-04	YVD-060821-22	6/8/2021	N	124212	**182**	--	--	**182**	--	--	0.070	U	--	--	--	--	**35.4**	--	--	**12.5**	--	--	**0.160**	--	--	**10.7**	--	--	--	--	--	**3.73**	--	--
YVD-04	YVD-060622-17	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**4.70**	--	--
YVD-04	YVD-061923-03	6/19/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**3.93**	J	HTQ
YVD-05	YVD-05-130917	09/17/2013	N	SWI0113	**184**	--	--	**185**	--	--	--	--	--	**0.112**	--	--	**66.0**	--	--	**10.2**	--	--	0.500	U	--	**31.0**	--	--	--	--	--	**4.90**	--	--
YVD-05	YVD-05-131211	12/11/2013	N	SWL0063	**174**	--	--	**175**	--	--	--	--	--	--	R	MSD	**41.5**	--	--	**10.0**	--	--	1.00	U	--	**17.0**	--	--	--	--	--	**4.36**	--	--
YVD-05	YVD-05-140317	03/17/2014	N	SXC0081	**174**	--	--	**175**	--	--	--	--	--	0.100	U	--	**33.7**	--	--	**8.40**	--	--	**1.30**	--	--	**13.5**	--	--	--	--	--	**3.30**	--	--
YVD-05	YVD-05-140601	06/01/2014	N	SXF0008	**164**	--	--	**165**	--	--	--	--	--	0.100	U	--	**30.8**	--	--	**8.40**	--	--	1.00	U	--	**13.2**	--	--	--	--	--	**3.00**	--	--
YVD-05	YVD-05-140922	09/22/2014	N	SXI0148	**159**	--	--	**160**	--	--	--	--	--	0.100	U	--	**31.6**	--	--	**7.60**	--	--	1.00	U	--	**13.7**	--	--	--	--	--	**2.82**	--	--
YVD-05	YVD-05-141215	12/15/2014	N	SXL0103	**154**	--	--	**155**	--	--	--	--	--	0.100	U	--	**36.9**	--	--	**4.56**	J+	MSD, FDP	1.00	U	--	**17.0**	--	--	--	--	--	**1.50**	J	FDP, DUP
YVD-05	YVD-D1-141215	12/15/2014	FD	SXL0103	**153**	--	--	**155**	--	--	--	--	--	0.100	U	--	**34.2**	--	--	**7.80**	J+	MSD, FDP	0.500	U	--	**15.0**	--	--	--	--	--	**2.65**	J	FDP, DUP
YVD-05	YVD-05-150316	03/16/2015	N	5904471	**160**	--	--	**160**	--	--	--	--	--	0.100	U	--	**33.0**	--	--	**8.00**	--	--	1.00	U	--	**15.0**	--	--	--	--	--	**2.80**	--	--
YVD-05	YVD-05-150616	06/16/2015	N	59010751	**170**	--	--	**170**	--	--	--	--	--	0.100	U	--	**35.0**	J+	MSD	**8.90**	--	--	1.00	U	--	**16.0**	J+	MSD	--	--	--	**3.10**	--	--
YVD-05	YVD-05-150922	09/22/2015	N	59020281	**160**	--	--	**160**	--	--	--	--	--	0.100	U	--	**42.0**	--	--	**8.80**	--	--	1.00	U	--	**20.0**	--	--	--	--	--	**3.00**	--	--
YVD-05	YVD-05-151214	12/14/2015	N	59025351	**180**	--	--	**180**	--	--	--	--	--	--	R	MSD	**37.0**	--	--	**7.90**	--	--	1.00	U	--	**17.0**	--	--	--	--	--	**2.80**	--	--
YVD-05	YVD-05-160307	03/07/2016	N	59029521	**160**	J	FDP	**160**	J	FDP	--	--	--	0.100	UJ	RPD	**32.0**	--	--	**8.30**	--	--	1.00	U	--	**15.0**	--	--	--	--	--	**2.70**	--	--
YVD-05	YVD-D1-160307	03/07/2016	FD	59029521	**170**	J	FDP	**170**	J	FDP	--	--	--	0.100	UJ	RPD	**32.0**	--	--	**8.70**	--	--	**0.590**	--	--	**15.0**	--	--	--	--	--	**2.90**	--	--
YVD-05	YVD-05-160620	6/20/2016	N	59037151	**170**	--	--	**170**	--	--	--	--	--	0.100	U	--	**31.0**	--	--	**9.10**	--	--	1.00	U	--	**14.0**	--	--	--	--	--	**3.00**	--	--
YVD-05	YVD-05-160928	9/28/2016	N	K1611698	**171**	--	--	**171**	--	--	--	--	--	0.050	U	MBK	**32.1**	--	--	**8.37**	--	--	**0.440**	--	--	**13.8**	--	--	--	--	--	**3.12**	--	--
YVD-05	YVD-05-161215	12/15/2016	N	K1615174	**163**	--	--	**163**	--	--	--	--	--	0.050	U	--	**33.3**	--	--	**8.30**	--	--	**0.480**	--	--	**13.1**	--	--	--	--	--	**3.15**	--	--
YVD-05	YVD-031317-32	3/13/2017	N	K1702489	**166**	--	--	**166**	--	--	--	--	--	0.050	U	--	**31.4**	--	--	**7.89**	--	--	**0.490**	--	--	**14.1**	--	--	--	--	--	**2.88**	--	--
YVD-05	YVD-031317-34	3/13/2017	FD	K1702489	**168**	--	--	**168**	--	--	--	--	--	0.050	U	--	**31.4**	--	--	**7.92**	--	--	**0.480**	--	--	**14.0**	--	--	--	--	--	**2.91**	--	--
YVD-05	YVD-060617-23	6/6/2017	N	K1705754	**168**	--	--	**168**	--	--	--	--	--	0.050	U	--	**31.6**	--	--	**8.12**	--	--	**0.470**	--	--	**13.9**	--	--	--	--	--	**2.90**	--	--
YVD-05	YVD-092517-09	9/25/2017	N	K1710274	**173**	--	--	**173**	--	--	--	--	--	0.050	U	--	**35.3**	--	--	**8.01**	--	--	**0.470**	--	--	**14.6**	--	--	--	--	--	**2.82**	--	--
YVD-05	YVD-120517-15	12/5/2017	N	K1713091	**171**	--	--	**171**	--	--	--	--	--	0.050	U	MBK	**31.3**	--	--	**7.92**	--	--	**0.510**	--	--	**13.5**	--	--	--	--	--	**2.81**	--	--
YVD-05	YVD-060518-29	6/5/2018	N	874860	**170**	--	--	**170**	--	--	0.070	U	--	--	--	--	**31.6**	--	--	**8.29**	--	--	**0.440**	--	--	**14.2**	--	--	--	--	--	**2.79**	--	--
YVD-05	YVD-060219-09	6/2/2019	N	991939	**176**	--	--	**176**	--	--	0.070	U	--	--	--	--	**33.2**	--	--	6.43	U	FBK	0.310	U	FBK	**14.4**	--	--	--	--	--	**2.18**	--	--
YVD-05	YVD-060920-15	6/9/2020	N	009269	**182**	--	--	**182**	--	--	0.070	U	--	--	--	--	**35.4**	--	--	**9.24**	--	--	**0.390**	--	--	**15.4**	--	--	--	--	--	**3.88**	--	--
YVD-05	YVD-060821-26	6/8/2021	N	124212	**198**	--	--	**198**	--	--	0.070	U	--	--	--	--	**39.6**	--	--	**11.0**	--	--	**0.680**	--	--	**17.3**	--	--	--	--	--	**4.50**	--	--
YVD-05	YVD-060622-19	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**5.60**	--	--
YVD-05	YVD-062023-09	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**6.18**	J	HTQ
YVD-06	YVD-06-130917	09/17/2013	N	SWI0113	**149**	--	--	**150**	--	--	--	--	--	0.100	U	--	**46.0**	--	--	**3.13**	--	--	0.500	U	--	**12.8**	--	--	--	--	--	**0.510**	--	--
YVD-06	YVD-06-131209	12/09/2013	N	SWL0055	**154**	--	--	**155**	--	--	--	--	--	0.020	UJ	MSD	**31.2**	J	FDP	**2.73**	--	--	0.500	U	--	**5.27**	J	FDP	--	--	--	**0.490**	J	FDP
YVD-06	YVD-D1-131209	12/09/2013	FD	SWL0055	**159**	--	--	**160**	--	--	--	--	--	0.020	UJ	MSD	**38.9**	J	FDP	8.00	U	--	5.00	U	--	**6.55**	J	FDP	--	--	--	**6.400**	J	FDP
YVD-06	YVD-06-140316	03/16/2014	N	SXC0081	**174**	--	--	**175**	--	--	--	--	--	0.100	U	--	**40.1**	--	--	**3.47**	--	--	**0.580**	--	--	**7.59**	--	--	--	--	--	**0.610**	--	--
YVD-06	YVD-D1-140316	03/16/2014	FD	SXC0081	**159**	--	--	**160**	--	--	--	--	--	0.100	U	--	**40.5**	--	--	**3.16**	--	--	**0.550**	--	--	**7.78**	--	--	--	--	--	**0.620**	--	--
YVD-06	YVD-06-140601	06/01/2014	N	SXF0008	**156**	--	--	**158**	--	--	--	--	--	**0.172**	--	--	**37.8**	--	--	**2.88**	J	DUP	0.500	U	--	**6.50**	--	--	--	--	--	**0.510**	--	--
YVD-06	YVD-D1-140601	06/01/2014	FD	SXF0008	**153**	--	--	**155**	--	--	--	--	--	0.100	U	--	**38.3**	--	--	**2.95**	--	--	0.500	U	--	**6.56**	--	--	--	--	--	**0.560**	--	--
YVD-06	YVD-06-140921	09/21/2014	N	SXI0148	**149**	--	--	**150**	--	--	--	--	--	**0.139**	--	--	**41.3**	--	--	**2.45**	--	--	0.500	U	--	**8.52**	--	--	--	--	--	**0.440**	--	--
YVD-06	YVD-06-141215	12/15/2014	N	SXL0103	**149**	--	--	**150**	--	--	--	--	--	0.100	U	--	**40.3**	--	--	**2.50**	J+	MSD	0.500	U	--	**7.83**	--	--	--	--	--	**0.450**	J	DUP
YVD-06	YVD-06-150316	03/16/2015	N	5904471	**150**	--	--	**150**	--	--	--	--	--	0.100	U	--	**38.0**	--	--	**2.80**	--	--	0.500	U	--	**6.80**	--	--	--	--	--	**0.990**	--	--
YVD-06	YVD-06-150616	06/16/2015	N	59010751	**150**	--	--	**150**	--	--	--	--	--	0.100	U	--	**40.0**	J+	MSD	**2.70**	--	--	0.500	U	--	**7.00**	J+	MSD	--	--	--	**0.530**	--	--
YVD-06	YVD-06-150922	09/22/2015	N	59020141	**170**	--	--	**170**	--	--	--	--	--	**0.110**	--	--	**41.0**	--	--	**2.80**	--	--	0.500	U	--	**9.80**	--	--	--	--	--	**0.510**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-06	YVD-06-151214	12/14/2015	N	59025351	**170**	--	--	**170**	--	--	--	--	--	--	R	MSD	**42.0**	--	--	**2.40**	--	--	0.500	U	--	**7.30**	--	--	--	--	--	**0.510**	--	--
YVD-06	YVD-06-160307	03/07/2016	N	59029521	**160**	J	FDP	**160**	J	FDP	--	--	--	0.100	UJ	RPD	**38.0**	--	--	**2.80**	--	--	0.500	U	--	**7.20**	--	--	--	--	--	**0.510**	--	--
YVD-06	YVD-06-160620	6/20/2016	N	59037151	**150**	--	--	**150**	--	--	--	--	--	0.100	U	--	**37.0**	--	--	**3.10**	--	--	0.500	U	--	**6.60**	--	--	--	--	--	**0.530**	--	--
YVD-06	YVD-06-160929	9/29/2016	N	K1611704	**145**	--	--	**145**	--	--	--	--	--	0.050	U	MBK	**35.7**	--	--	**2.64**	--	--	**0.200**	--	--	**6.12**	--	--	--	--	--	**0.550**	--	--
YVD-06	YVD-06-161215	12/15/2016	N	K1615126	**136**	--	--	**136**	--	--	--	--	--	0.050	U	--	**33.5**	--	--	**3.14**	--	--	**0.230**	--	--	**5.73**	--	--	--	--	--	**0.700**	--	--
YVD-06	YVD-030617-04	3/6/2017	N	K1702228	**142**	--	--	**142**	--	--	--	--	--	**0.021**	J	--	**35.2**	--	--	**2.83**	--	--	**0.290**	--	--	**5.84**	--	--	--	--	--	**0.610**	--	--
YVD-06	YVD-060617-21	6/6/2017	N	K1705754	**144**	--	--	**144**	--	--	--	--	--	0.050	U	--	**36.9**	--	--	**2.54**	--	--	**0.190**	J	--	**6.07**	--	--	--	--	--	**0.510**	--	--
YVD-06	YVD-092617-17	9/26/2017	N	K1710333	**140**	--	--	**140**	--	--	--	--	--	0.050	U	--	**35.0**	--	--	**2.94**	--	--	**0.230**	--	--	**5.82**	--	--	--	--	--	**0.620**	--	--
YVD-06	YVD-092617-18	9/26/2017	FD	K1710333	**140**	--	--	**140**	--	--	--	--	--	0.050	U	--	**34.6**	--	--	**2.95**	--	--	**0.220**	--	--	**5.77**	--	--	--	--	--	**0.620**	--	--
YVD-06	YVD-120517-17	12/5/2017	N	K1713091	**137**	--	--	**137**	--	--	--	--	--	0.050	U	MBK	**34.7**	--	--	**3.23**	--	--	**0.250**	--	--	**5.81**	--	--	--	--	--	**0.730**	--	--
YVD-06	YVD-060318-15	6/3/2018	N	874568	**138**	--	--	**138**	--	--	0.090	U	FBK	--	--	--	**37.5**	--	--	**2.69**	--	--	**0.180**	--	--	**6.45**	--	--	--	--	--	**0.560**	--	--
YVD-06	YVD-060219-11	6/2/2019	N	991939	**134**	--	--	**134**	--	--	0.070	U	--	--	--	--	**35.6**	--	--	2.50	U	FBK	0.150	U	FBK	**6.05**	--	--	--	--	--	**0.510**	--	--
YVD-06	YVD-060920-17	6/9/2020	N	009269	**132**	--	--	**132**	--	--	0.070	U	--	--	--	--	**34.2**	--	--	**3.20**	--	--	**0.170**	--	--	**5.90**	--	--	--	--	--	**0.700**	--	--
YVD-06	YVD-060721-19	6/7/2021	N	124105	**160**	--	--	**160**	--	--	0.070	U	--	--	--	--	**34.0**	--	--	**4.95**	--	--	**0.250**	--	--	**5.90**	--	--	--	--	--	**0.670**	--	--
YVD-06	YVD-062023-06	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**0.76**	J	HTQ
YVD-06	YVD-062023-07	6/20/2023	FD	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**0.75**	J	HTQ
YVD-07	YVD-07-130923	09/23/2013	N	SWI0178	**79.4**	--	--	**80.0**	--	--	--	--	--	0.100	U	--	**27.7**	--	--	--	--	--	--	--	--	**16.2**	--	--	--	--	--	--	--	--
YVD-07	YVD-07-130926	09/26/2013	N	SWI0190	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**7.53**	--	--	0.500	U	--	--	--	--	--	--	--	**4.40**	--	--
YVD-07	YVD-07-131210	12/10/2013	N	SWL0055	**135**	--	--	**135**	--	--	--	--	--	0.020	UJ	MSD	**99.2**	--	--	**8.46**	--	--	**0.550**	--	--	**16.0**	--	--	--	--	--	**5.30**	--	--
YVD-07	YVD-07-140316	03/16/2014	N	SXC0081	**134**	--	--	**135**	--	--	--	--	--	**0.116**	--	--	**33.4**	--	--	**11.6**	--	--	**0.830**	--	--	**14.1**	--	--	--	--	--	**3.90**	--	--
YVD-07	YVD-07-140604	06/04/2014	N	SXF0025	**137**	--	--	**138**	--	--	--	--	--	0.100	U	--	**38.4**	--	--	**9.74**	--	--	1.00	U	--	**18.3**	--	--	--	--	--	**3.36**	--	--
YVD-07	YVD-07-140922	09/22/2014	N	SXI0158	**134**	--	--	**135**	--	--	--	--	--	--	R	MSD	**31.4**	--	--	**10.3**	--	--	1.00	U	--	**12.7**	--	--	--	--	--	**5.52**	--	--
YVD-07	YVD-07-141216	12/16/2014	N	SXL0108	**133**	--	--	**135**	--	--	--	--	--	0.100	U	--	**29.9**	--	--	**8.76**	--	--	1.00	U	--	**12.2**	--	--	--	--	--	**2.92**	--	--
YVD-07	YVD-07-150316	03/16/2015	N	5904541	**140**	--	--	**140**	--	--	--	--	--	0.100	U	--	**37.0**	--	--	**15.0**	--	--	1.00	U	--	**15.0**	--	--	--	--	--	**4.00**	J--	MSD
YVD-07	YVD-D2-150316	03/16/2015	FD	5904541	**140**	--	--	**140**	--	--	--	--	--	0.100	U	--	**35.0**	--	--	**16.0**	--	--	**0.650**	--	--	**14.0**	--	--	--	--	--	**4.20**	J--	MSD
YVD-07	YVD-07-150616	06/16/2015	N	59010751	**150**	--	--	**150**	--	--	--	--	--	0.100	U	--	**34.0**	J+	MSD	**13.0**	--	--	0.500	U	--	**14.0**	J+	MSD	--	--	--	**3.30**	--	--
YVD-07	YVD-D1-150616	06/16/2015	FD	59010751	**140**	--	--	**140**	--	--	--	--	--	0.100	U	--	**35.0**	J+	MSD	**14.0**	--	--	0.500	U	--	**14.0**	J+	MSD	--	--	--	**3.50**	--	--
YVD-07	YVD-07-150923	09/23/2015	N	59020281	**160**	--	--	**160**	--	--	--	--	--	**0.220**	--	--	**33.0**	--	--	**9.90**	--	--	1.00	U	--	**14.0**	--	--	--	--	--	**4.70**	--	--
YVD-07	YVD-07-151214	12/14/2015	N	59025431	**140**	J	FDP	**140**	J	FDP	--	--	--	--	R	MSD	**30.0**	--	--	**6.70**	--	--	1.00	U	--	**13.0**	--	--	--	--	--	**2.40**	--	--
YVD-07	YVD-07-160308	03/08/2016	N	59029711	**140**	--	--	**140**	--	--	--	--	--	**1.10**	J+	FBK, FDP	**25.0**	--	--	**6.70**	--	--	1.00	U	--	**11.0**	--	--	--	--	--	**1.80**	--	--
YVD-07	YVD-07-160621	6/21/2016	N	59037151	**100.0**	--	--	**100.0**	--	--	--	--	--	0.100	U	--	**19.0**	--	--	**6.20**	--	--	1.00	U	--	**9.00**	--	--	--	--	--	**1.20**	--	--
YVD-07	YVD-07-160929	9/29/2016	N	K1611704	**113**	--	--	**113**	--	--	--	--	--	0.050	U	MBK	**17.8**	--	--	**5.30**	--	--	**0.400**	--	--	**7.14**	--	--	--	--	--	**1.37**	--	--
YVD-07	YVD-07-161213	12/13/2016	N	K1615083	**120**	--	--	**120**	--	--	--	--	--	0.050	U	--	**25.9**	--	--	**6.38**	--	--	**0.400**	--	--	**10.2**	--	--	--	--	--	**2.15**	--	--
YVD-07	YVD-030717-07	3/7/2017	N	K1702324	**107**	--	--	**107**	--	--	--	--	--	1.00	U	--	**17.6**	--	--	**5.34**	--	--	**0.430**	--	--	**6.47**	--	--	--	--	--	**1.74**	J	HTQ
YVD-07	YVD-060517-15	6/5/2017	N	K1705754	**105**	--	--	**105**	--	--	--	--	--	0.050	U	--	**19.4**	--	--	**6.07**	--	--	**0.390**	--	--	**7.31**	--	--	--	--	--	**2.07**	--	--
YVD-07	YVD-092617-21	9/26/2017	N	K1710333	**116**	--	--	**116**	--	--	--	--	--	0.050	U	--	**25.4**	--	--	**7.45**	--	--	**0.350**	--	--	**9.27**	--	--	--	--	--	**3.47**	--	--
YVD-07	YVD-120417-11	12/4/2017	N	K1713026	**130**	--	--	**130**	--	--	--	--	--	0.050	U	--	**29.5**	--	--	**8.32**	--	--	**0.370**	--	--	**11.1**	--	--	--	--	--	**4.40**	--	--
YVD-07	YVD-060418-23	6/4/2018	N	874662	**126**	--	--	**126**	--	--	0.470	U	FBK	--	--	--	**34.0**	--	--	**10.5**	--	--	**0.300**	--	--	**13.4**	--	--	--	--	--	**3.34**	--	--
YVD-07	YVD-060319-16	6/3/2019	N	992053	**127**	--	--	**127**	--	--	0.070	U	--	--	--	--	**31.0**	--	--	**5.83**	--	--	**0.170**	--	--	**11.8**	--	--	--	--	--	**1.86**	--	--
YVD-07	YVD-060920-27	6/9/2020	N	009269	**145**	--	--	**145**	--	--	0.070	U	--	--	--	--	**33.8**	--	--	**8.90**	--	--	**0.290**	--	--	**13.7**	--	--	--	--	--	**4.86**	--	--
YVD-07	YVD-060821-34	6/8/2021	N	124212	**142**	--	--	**142**	--	--	0.070	U	--	--	--	--	**33.1**	--	--	**7.68**	--	--	**0.220**	--	--	**13.5**	--	--	--	--	--	**3.34**	--	--
YVD-07	YVD-060622-21	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**4.30**	--	--
YVD-07	YVD-060622-22	6/6/2022	FD	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**4.30**	--	--
YVD-07	YVD-062023-19	6/20/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**4.15**	J	HTQ
YVD-08	YVD-08-130919	09/19/2013	N	SWI0138	**354**	--	--	**355**	--	--	--	--	--	0.100	U	--	**126**	--	--	**145**	--	--	5.00	U	--	**43.8**	--	--	--	--	--	**8.00**	--	--
YVD-08	YVD-08-131211	12/11/2013	N	SWL0063	**259**	--	--	**260**	--	--	--	--	--	--	R	MSD	**134**	--	--	**123**	--	--	5.00	U	--	**53.8**	--	--	--	--	--	**22.5**	--	--
YVD-08	YVD-08-140317	03/17/2014	N	SXC0095	**294**	--	--	**295**	--	--	--	--	--	**0.146**	--	--	**122**	--	--	**128**	--	--	5.00	U	--	**42.0**	--	--	--	--	--	**14.3**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-08	YVD-08-140602	06/02/2014	N	SXF0017	**279**	--	--	**280**	--	--	--	--	--	0.100	U	--	**138**	--	--	**118**	--	--	2.00	U	--	**64.6**	--	--	--	--	--	**14.7**	--	--
YVD-08	YVD-08-140923	09/23/2014	N	SXI0173	**249**	--	--	**250**	--	--	--	--	--	0.100	U	--	**103**	--	--	**122**	--	--	2.50	U	--	**36.3**	--	--	--	--	--	**8.10**	--	--
YVD-08	YVD-08-141216	12/16/2014	N	SXL0108	**264**	--	--	**265**	--	--	--	--	--	0.100	U	--	**111**	--	--	**126**	--	--	2.50	U	--	**41.4**	--	--	--	--	--	**14.0**	--	--
YVD-08	YVD-08-150317	03/17/2015	N	5904541	**230**	--	--	**230**	--	--	--	--	--	0.100	U	--	**110**	--	--	**120**	--	--	2.50	U	--	**40.0**	--	--	--	--	--	**13.0**	J--	MSD
YVD-08	YVD-D3-150317	03/17/2015	FD	5904541	**240**	--	--	**240**	--	--	--	--	--	0.100	U	--	**100**	--	--	**130**	--	--	0.500	U	--	**39.0**	--	--	--	--	--	**14.0**	J--	MSD
YVD-08	YVD-08-150617	06/17/2015	N	59010961	**280**	J	FDP	**280**	J	FDP	--	--	--	**0.140**	--	--	**110**	--	--	**120**	--	--	2.50	U	--	**40.0**	--	--	--	--	--	**19.0**	--	--
YVD-08	YVD-D3-150617	06/17/2015	FD	59010961	**220**	J	FDP	**220**	J	FDP	--	--	--	0.100	U	--	**110**	--	--	**140**	--	--	5.00	U	--	**39.0**	--	--	--	--	--	**19.0**	--	--
YVD-08	YVD-08-150924	09/24/2015	N	59020391	**260**	--	--	**260**	--	--	--	--	--	0.100	UJ	MSD	**110**	--	--	**120**	--	--	2.50	U	--	**44.0**	--	--	--	--	--	**20.0**	J+	MSD
YVD-08	YVD-08-151215	12/15/2015	N	59025501	**260**	--	--	**260**	--	--	--	--	--	--	R	MSD	**120**	--	--	**120**	--	--	2.50	U	--	**44.0**	--	--	--	--	--	**26.0**	--	--
YVD-08	YVD-D3-151215	12/15/2015	FD	59025501	**250**	--	--	**250**	--	--	--	--	--	**0.150**	J--	MSD	**120**	--	--	**110**	--	--	5.00	U	--	**46.0**	--	--	--	--	--	**26.0**	--	--
YVD-08	YVD-08-160310	03/10/2016	N	59029941	**240**	--	--	**240**	--	--	--	--	--	0.100	U	--	**120**	--	--	**120**	--	--	2.50	U	--	**44.0**	--	--	--	--	--	**32.0**	--	--
YVD-08	YVD-08-160622	6/22/2016	N	59037271	**230**	--	--	**230**	--	--	--	--	--	0.100	UJ	MSD	**120**	--	--	**110**	--	--	2.50	U	--	**46.0**	--	--	--	--	--	**34.0**	--	--
YVD-08	YVD-D3-160622	6/22/2016	FD	59037271	**230**	--	--	**230**	--	--	--	--	--	0.100	UJ	FBK, MSD	**120**	--	--	**120**	--	--	0.500	U	--	**46.0**	--	--	--	--	--	**34.0**	--	--
YVD-08	YVD-08-160927	9/27/2016	N	K1611565	**239**	--	--	**239**	--	--	--	--	--	0.050	U	MBK	**120**	--	--	**96.0**	--	--	**0.180**	J	--	**47.0**	--	--	--	--	--	**30.6**	--	--
YVD-08	YVD-08-161213	12/13/2016	N	K1615045	**222**	--	--	**222**	--	--	--	--	--	0.050	U	--	**122**	--	--	**89.3**	--	--	**0.230**	--	--	**41.9**	--	--	--	--	--	**34.5**	J	HTQ
YVD-08	YVD-030917-24	3/9/2017	N	K1702448	**263**	--	--	**263**	--	--	--	--	--	0.050	U	--	**136**	--	--	**95.2**	--	--	**0.200**	J	--	**44.4**	--	--	--	--	--	**37.3**	J	HTQ
YVD-08	YVD-060717-29	6/7/2017	N	K1705833	**236**	--	--	**236**	--	--	--	--	--	0.050	U	--	**139**	--	--	**94.3**	--	--	**0.170**	J	--	**48.3**	--	--	--	--	--	**44.0**	--	--
YVD-08	YVD-092617-19	9/26/2017	N	K1710333	**271**	--	--	**271**	--	--	--	--	--	0.050	U	--	**137**	--	--	**98.0**	--	--	**0.190**	J	--	**44.3**	--	--	--	--	--	**38.6**	J	HTQ
YVD-08	YVD-120517-23	12/5/2017	N	K1713157	**233**	--	--	**233**	--	--	--	--	--	0.050	U	--	**147**	--	--	**98.8**	--	--	**0.200**	J	--	**48.1**	--	--	--	--	--	**49.3**	--	--
YVD-08	YVD-031918-15	3/19/2018	N	870634	**250**	--	--	**250**	--	--	0.070	U	--	--	--	--	**134**	--	--	**103**	--	--	**0.150**	--	--	**46.0**	--	--	--	--	--	**46.3**	--	--
YVD-08	YVD-060518-31	6/5/2018	N	874860	**238**	--	--	**238**	--	--	0.070	U	--	--	--	--	**136**	--	--	**99.0**	--	--	**0.160**	--	--	**47.5**	--	--	--	--	--	**53.0**	--	--
YVD-08	YVD-090918-04	9/9/2018	N	880601	**237**	--	--	**237**	--	--	0.070	U	--	--	--	--	**146**	--	--	**103**	--	--	**0.180**	--	--	**49.2**	--	--	--	--	--	**54.4**	--	--
YVD-08	YVD-121118-19	12/11/2018	N	884939	**227**	--	--	**227**	--	--	0.070	U	--	--	--	--	**138**	--	--	**117**	--	--	**0.160**	--	--	**45.9**	--	--	--	--	--	**59.4**	--	--
YVD-08	YVD-031719-03	3/17/2019	N	988239	**234**	--	--	**234**	--	--	0.070	U	--	--	--	--	**138**	--	--	**119**	--	--	0.220	U	FBK	**46.3**	--	--	--	--	--	**54.8**	--	--
YVD-08	YVD-060319-21	6/3/2019	N	992053	**240**	--	--	**240**	--	--	0.070	U	--	--	--	--	**138**	--	--	**100**	--	--	**0.100**	--	--	**46.1**	--	--	--	--	--	**50.0**	--	--
YVD-08	YVD-090919-02	9/9/2019	N	998357	**226**	--	--	**226**	--	--	0.070	U	--	--	--	--	**139**	--	--	**89.8**	--	--	**0.150**	--	--	**45.7**	--	--	--	--	--	**62.0**	--	--
YVD-08	YVD-120919-02	12/9/2019	N	902276	**227**	--	--	**227**	--	--	0.070	U	--	--	--	--	**132**	--	--	**95.6**	--	--	**0.160**	--	--	**44.6**	--	--	--	--	--	**61.8**	--	--
YVD-08	YVD-120919-04	12/9/2019	FD	902276	**226**	--	--	**226**	--	--	0.070	U	--	--	--	--	**130**	--	--	**94.3**	--	--	**0.150**	--	--	**44.5**	--	--	--	--	--	**61.6**	--	--
YVD-08	YVD-033120-17	3/31/2020	N	006260	**213**	--	--	**213**	--	--	0.070	U	--	--	--	--	**132**	--	--	**96.5**	--	--	**0.180**	--	--	**45.7**	--	--	--	--	--	**68.0**	--	--
YVD-08	YVD-060920-23	6/9/2020	N	009269	**217**	--	--	**217**	--	--	0.070	U	--	--	--	--	**132**	--	--	**96.1**	--	--	**0.190**	--	--	**44.8**	--	--	--	--	--	**66.6**	--	--
YVD-08	YVD-092120-11	9/21/2020	N	013896	**216**	--	--	**216**	--	--	0.070	U	--	--	--	--	**134**	--	--	**96.2**	--	--	**0.160**	--	--	**45.8**	--	--	--	--	--	**66.0**	--	--
YVD-08	YVD-120720-11	12/7/2020	N	017035	**215**	--	--	**215**	--	--	0.070	U	--	--	--	--	**132**	--	--	**107**	--	--	**0.200**	--	--	**45.9**	--	--	--	--	--	**62.2**	--	--
YVD-08	YVD-030121-07	3/1/2021	N	119931	**217**	--	--	**217**	--	--	0.070	U	--	--	--	--	**135**	--	--	**92.9**	--	--	**0.200**	--	--	**45.8**	--	--	--	--	--	**68.8**	--	--
YVD-08	YVD-060821-28	6/8/2021	N	124212	**218**	--	--	**218**	--	--	0.070	U	--	--	--	--	**130**	--	--	**94.2**	--	--	**0.170**	--	--	**44.9**	--	--	--	--	--	**62.0**	--	--
YVD-08	YVD-121521-20	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**60.8**	J	HTQ, MS
YVD-08	YVD-031522-12	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**68.1**	--	--
YVD-08	YVD-060722-27	6/7/2022	N	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**69.1**	J	HTQ
YVD-08	YVD-091322-05	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**64.8**	--	--
YVD-08	YVD-122722-19	12/27/2022	N	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**71.5**	--	--
YVD-08	YVD-030623-13	3/6/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**47.8**	--	--	--	--	--	--
YVD-08	YVD-062123-28	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**54.3**	J	HTQ
YVD-08	YVD-091023-01	9/10/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**76.9**	J	HTQ
YVD-09	YVD-09-130919	09/19/2013	N	SWI0138	**369**	--	--	**370**	--	--	--	--	--	0.100	U	--	**107**	--	--	**96.3**	--	--	5.00	U	--	**39.3**	--	--	--	--	--	**74.7**	--	--
YVD-09	YVD-09-131212	12/12/2013	N	SWL0078	**384**	--	--	**385**	--	--	--	--	--	0.020	U	--	**109**	--	--	**87.2**	--	--	5.00	U	--	**42.0**	--	--	--	--	--	**64.4**	--	--
YVD-09	YVD-09-140319	03/19/2014	N	SXC0107	**388**	--	--	**390**	--	--	--	--	--	0.100	U	--	**109**	--	--	**104**	--	--	**5.50**		--	**40.8**	--	--	--	--	--	**62.4**	--	--
YVD-09	YVD-09-140603	06/03/2014	N	SXF0025	**367**	--	--	**368**	--	--	--	--	--	0.100	U	--	**113**	--	--	**89.8**	--	--	5.00	U	--	**44.5**	--	--	--	--	--	**57.1**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-09	YVD-09-140924	09/24/2014	N	SXI0173	**359**	--	--	**360**	--	--	--	--	--	0.100	U	--	**118**	--	--	**68.2**	--	--	5.00	U	--	**41.7**	--	--	--	--	--	**48.0**	--	--
YVD-09	YVD-09-141217	12/17/2014	N	SXL0121	**359**	--	--	**360**	--	--	--	--	--	0.100	U	--	**130**	--	--	**85.0**	--	--	5.00	U	--	**56.3**	--	--	--	--	--	**53.9**	--	--
YVD-09	YVD-09-150318	03/18/2015	N	5904651	**350**	--	--	**350**	--	--	--	--	--	**0.140**	--	--	**110**	--	--	**74.0**	--	--	5.00	U	--	**46.0**	--	--	--	--	--	**47.0**	--	--
YVD-09	YVD-09-150617	06/17/2015	N	59010961	**350**	--	--	**350**	--	--	--	--	--	**0.140**	--	--	**110**	--	--	**89.0**	--	--	5.00	U	--	**43.0**	--	--	--	--	--	**54.0**	--	--
YVD-09	YVD-09-150923	09/23/2015	N	59020391	**330**	--	--	**330**	--	--	--	--	--	**0.210**	J	MSD	**110**	--	--	**78.0**	--	--	0.500	U	--	**46.0**	--	--	--	--	--	**56.0**	J+	MSD
YVD-09	YVD-09-151215	12/15/2015	N	59025501	**340**	--	--	**340**	--	--	--	--	--	--	R	MSD	**110**	--	--	**77.0**	--	--	5.00	U	--	**42.0**	--	--	--	--	--	**52.0**	--	--
YVD-09	YVD-09-160310	03/10/2016	N	59029941	**360**	--	--	**360**	--	--	--	--	--	**0.120**	--	--	**110**	--	--	**72.0**	--	--	5.00	U	--	**42.0**	--	--	--	--	--	**48.0**	--	--
YVD-09	YVD-09-160622	6/22/2016	N	59037271	**350**	--	--	**350**	--	--	--	--	--	0.100	UJ	MSD	**100**	--	--	**76.0**	--	--	5.00	U	--	**42.0**	--	--	--	--	--	**49.0**	--	--
YVD-09	YVD-09-160929	9/29/2016	N	K1611704	**347**	--	--	**347**	--	--	--	--	--	0.050	U	MBK	**103**	--	--	**66.7**	--	--	**0.340**	--	--	**41.2**	--	--	--	--	--	**43.2**	--	--
YVD-09	YVD-09-161213	12/13/2016	N	K1615045	**340**	--	--	**340**	--	--	--	--	--	0.050	U	--	**107**	--	--	**59.8**	--	--	**0.400**	--	--	**38.1**	--	--	--	--	--	**42.8**	J	HTQ
YVD-09	YVD-D2-161213	12/13/2016	FD	K1615045	**340**	--	--	**340**	--	--	--	--	--	0.050	U	--	**108**	--	--	**61.4**	--	--	**0.400**	--	--	**37.1**	--	--	--	--	--	**43.3**	J	HTQ
YVD-09	YVD-031317-35	3/13/2017	N	K1702489	**329**	--	--	**329**	--	--	--	--	--	0.050	U	--	**108**	--	--	**63.9**	--	--	**0.370**	--	--	**39.2**	--	--	--	--	--	**44.3**	--	--
YVD-09	YVD-060517-08	6/5/2017	N	K1705702	**341**	--	--	**341**	--	--	--	--	--	0.050	U	--	**110**	--	--	**62.6**	--	--	**0.390**	--	--	**39.4**	--	--	--	--	--	**44.6**	--	--
YVD-09	YVD-092617-29	9/26/2017	N	K1710381	**351**	--	--	**351**	--	--	--	--	--	0.050	U	--	**109**	--	--	**61.0**	--	--	**0.380**	--	--	**37.2**	--	--	--	--	--	**44.1**	J	HTQ
YVD-09	YVD-092617-30	9/26/2017	FD	K1710381	**415**	--	--	**415**	--	--	--	--	--	0.050	U	--	**109**	--	--	**61.1**	--	--	**0.380**	--	--	**37.4**	--	--	--	--	--	**44.1**	J	HTQ
YVD-09	YVD-120517-21	12/5/2017	N	K1713091	**351**	--	--	**351**	--	--	--	--	--	0.050	U	--	**108**	--	--	**63.0**	--	--	**0.380**	--	--	**35.9**	--	--	--	--	--	**46.9**	--	--
YVD-09	YVD-031918-18	3/19/2018	N	870634	**350**	--	--	**350**	--	--	0.070	U	--	--	--	--	**108**	--	--	**69.2**	--	--	**0.340**	--	--	**35.9**	--	--	--	--	--	**48.5**	--	--
YVD-09	YVD-060318-13	6/3/2018	N	874568	**348**	--	--	**348**	--	--	0.070	U	--	--	--	--	**107**	--	--	**63.4**	--	--	**0.360**	--	--	**37.8**	--	--	--	--	--	**50.6**	--	--
YVD-09	YVD-090918-06	9/9/2018	N	880601	**354**	--	--	**354**	--	--	0.070	U	--	--	--	--	**108**	--	--	**71.0**	--	--	**0.350**	--	--	**35.9**	--	--	--	--	--	**51.4**	--	--
YVD-09	YVD-121118-15	12/11/2018	N	884939	**358**	--	--	**358**	--	--	0.070	U	--	--	--	--	**102**	--	--	**65.6**	--	--	**0.340**	--	--	**34.3**	--	--	--	--	--	**52.8**	--	--
YVD-09	YVD-121118-17	12/11/2018	FD	884939	**357**	--	--	**357**	--	--	0.070	U	--	--	--	--	**103**	--	--	**68.0**	--	--	**0.330**	--	--	**34.6**	--	--	--	--	--	**54.6**	--	--
YVD-09	YVD-031719-05	3/17/2019	N	988239	**356**	--	--	**356**	--	--	0.070	U	--	--	--	--	**104**	--	--	**67.4**	--	--	0.310	U	FBK	**35.8**	--	--	--	--	--	**56.0**	--	--
YVD-09	YVD-060319-15	6/3/2019	N	992053	**353**	--	--	**353**	--	--	0.070	U	--	--	--	--	**104**	--	--	**43.4**	--	--	**0.360**	--	--	**35.7**	--	--	--	--	--	**53.3**	--	--
YVD-09	YVD-090919-04	9/9/2019	N	998357	**363**	--	--	**363**	--	--	0.070	U	--	--	--	--	**110**	--	--	**64.7**	--	--	**0.330**	--	--	**36.5**	--	--	--	--	--	**58.2**	--	--
YVD-09	YVD-120919-06	12/9/2019	N	902276	**356**	--	--	**356**	--	--	0.070	U	--	--	--	--	**106**	--	--	**69.1**	--	--	**0.370**	--	--	**35.8**	--	--	--	--	--	**57.0**	--	--
YVD-09	YVD-033020-05	3/30/2020	N	006241	**350**	--	--	**350**	--	--	0.070	U	--	--	--	--	**102**	--	--	**71.4**	--	--	**0.370**	--	--	**35.2**	--	--	--	--	--	**55.2**	--	--
YVD-09	YVD-060920-24	6/9/2020	N	009269	**350**	--	--	**350**	--	--	0.070	U	--	--	--	--	**102**	--	--	**68.8**	--	--	**0.310**	--	--	**35.4**	--	--	--	--	--	**55.2**	--	--
YVD-09	YVD-092120-16	9/21/2020	N	013896	**347**	--	--	**347**	--	--	0.070	U	--	--	--	--	**101**	--	--	**72.5**	--	--	0.100	U	--	**35.1**	--	--	--	--	--	**56.2**	--	--
YVD-09	YVD-120720-13	12/7/2020	N	017035	**345**	--	--	**345**	--	--	0.070	U	--	--	--	--	**101**	--	--	**69.4**	--	--	**0.260**	--	--	**35.7**	--	--	--	--	--	**54.0**	--	--
YVD-09	YVD-030121-05	3/1/2021	N	119931	**347**	--	--	**347**	--	--	0.070	U	--	--	--	--	**104**	--	--	**68.8**	--	--	**0.350**	--	--	**36.3**	--	--	--	--	--	**57.4**	--	--
YVD-09	YVD-060721-18	6/7/2021	N	124105	**352**	--	--	**352**	--	--	0.070	U	--	--	--	--	**102**	--	--	**75.9**	--	--	**0.320**	--	--	**35.5**	--	--	--	--	--	**54.4**	--	--
YVD-09	YVD-121421-09	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**55.3**	J	HTQ, MS
YVD-09	YVD-031522-14	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**60.8**	--	--
YVD-09	YVD-060622-12	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**60.7**	--	--
YVD-09	YVD-091322-07	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**59.8**	--	--
YVD-09	YVD-120822-15	12/8/2022	N	K2214578	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**61.8**	--	--
YVD-09	YVD-030623-19	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**65.0**	--	--	--	--	--
YVD-09	YVD-062123-30	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**63.6**	J	HTQ
YVD-09	YVD-091123-07	9/11/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**65.7**	--	--
YVD-09	YVD-091123-09	9/11/2023	FD	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**65.6**	--	--
YVD-10	YVD-10-130917	09/17/2013	N	SWI0123	**464**	--	--	**465**	--	--	--	--	--	0.100	U	--	**216**	--	--	**95.4**	--	--	5.00	U	--	**51.8**	--	--	--	--	--	**95.0**		--
YVD-10	YVD-10-131212	12/12/2013	N	SWL0078	**459**	--	--	**460**	--	--	--	--	--	0.020	U	--	**202**	--	--	**91.4**	--	--	5.00	U	--	**55.6**	--	--	--	--	--	**86.9**	--	--
YVD-10	YVD-10-140319	03/19/2014	N	SXC0107	**489**	--	--	**490**	--	--	--	--	--	**0.109**	--	--	**218**	--	--	**86.8**	--	--	5.00	U	--	**54.0**	--	--	--	--	--	**77.6**	--	--
YVD-10	YVD-10-140603	06/03/2014	N	SXF0025	**487**	--	--	**488**	--	--	--	--	--	**0.105**	--	--	**232**	--	--	**94.3**	--	--	5.00	U	--	**58.6**	--	--	--	--	--	**86.1**	--	--
YVD-10	YVD-10-140924	09/24/2014	N	SXI0173	**523**	--	--	**525**	--	--	--	--	--	0.100	U	--	**276**	--	--	**115**	--	--	5.00	U	--	**65.8**	--	--	--	--	--	**97.2**	--	--
YVD-10	YVD-10-141217	12/17/2014	N	SXL0144	**503**	--	--	**505**	--	--	--	--	--	0.500	U	--	**248**	--	--	**97.9**	--	--	5.00	U	--	**60.4**	--	--	--	--	--	**78.7**	--	--
YVD-10	YVD-10-150318	03/18/2015	N	5904651	**590**	--	--	**590**	--	--	--	--	--	0.100	U	--	**400**	--	--	**180**	--	--	5.00	U	--	**92.0**	--	--	--	--	--	**120**	--	--
YVD-10	YVD-10-150617	06/17/2015	N	59010961	**600**	--	--	**600**	--	--	--	--	--	**0.120**	--	--	**390**	--	--	**39.0**	--	--	5.00	U	--	**95.0**	--	--	--	--	--	**20.0**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-10	YVD-10-150923	09/23/2015	N	59020391	**620**	--	--	**620**	--	--	--	--	--	**0.720**	J	MSD	**330**	--	--	**160**	--	--	5.00	U	--	**89.0**	--	--	--	--	--	**120**	J+	MSD
YVD-10	YVD-10-151214	12/14/2015	N	59025351	**600**	--	--	**600**	--	--	--	--	--	--	R	MSD	**350**	--	--	**150**	--	--	5.00	U	--	**84.0**	--	--	--	--	--	**120**	--	--
YVD-10	YVD-10-160309	03/09/2016	N	59029711	**520**	--	--	**520**	--	--	--	--	--	0.100	UJ	FDP	**310**	--	--	**140**	--	--	5.00	U	--	**73.0**	--	--	--	--	--	**98.0**	--	--
YVD-10	YVD-10-160621	6/21/2016	N	59037271	**510**	--	--	**510**	--	--	--	--	--	**0.110**	J-	MSD	**270**	--	--	**120**	--	--	5.00	U	--	**73.0**	--	--	--	--	--	**96.0**	--	--
YVD-10	YVD-10-160929	9/29/2016	N	K1611698	**513**	--	--	**513**	--	--	--	--	--	0.050	U	MBK	**286**	--	--	**105**	--	--	0.200	U	MBK	**63.1**	--	--	--	--	--	**84.0**	--	--
YVD-10	YVD-10-161212	12/12/2016	N	K1615029	**524**	--	--	**524**	--	--	--	--	--	0.050	U	--	**303**	--	--	**141**	--	--	**0.100**	J	--	**66.9**	--	--	--	--	--	**109**	J	HTQ
YVD-10	YVD-030917-27	3/9/2017	N	K1702448	**637**	--	--	**637**	--	--	--	--	--	0.050	U	--	**569**	--	--	**173**	--	--	**0.090**	J	--	**128**	--	--	--	--	--	**123**	J	HTQ
YVD-10	YVD-060617-22	6/6/2017	N	K1705754	**525**	--	--	**525**	--	--	--	--	--	0.050	U	--	**349**	--	--	**125**	--	--	**0.140**	J	--	**76.7**	--	--	--	--	--	**99.4**	--	--
YVD-10	YVD-092617-31	9/26/2017	N	K1710381	**523**	--	--	**523**	--	--	--	--	--	0.050	U	--	**316**	--	--	**113**	--	--	**0.090**	J	--	**66.7**	--	--	--	--	--	**93.9**	J	HTQ
YVD-10	YVD-120517-30	12/5/2017	N	K1713091	**540**	--	--	**540**	--	--	--	--	--	0.050	U	--	**327**	--	--	**128**	--	--	**0.110**	J	--	**67.3**	--	--	--	--	--	**109**	J	HTQ
YVD-10	YVD-031818-06	3/18/2018	N	870610	**527**	--	--	**527**	--	--	0.070	U	--	--	--	--	**296**	--	--	**121**	--	--	0.100	U	--	**61.0**	--	--	--	--	--	**91.4**	--	--
YVD-10	YVD-060318-06	6/3/2018	N	874568	**543**	--	--	**543**	--	--	0.080	U	FBK	--	--	--	**298**	--	--	**122**	--	--	0.100	U	--	**65.0**	--	--	--	--	--	**92.0**	--	--
YVD-10	YVD-090918-13	9/9/2018	N	880601	**557**	--	--	**557**	--	--	0.070	U	--	--	--	--	**308**	--	--	**128**	--	--	**0.100**	--	--	**63.5**	--	--	--	--	--	**90.0**	--	--
YVD-10	YVD-121018-08	12/10/2018	N	884857	**544**	--	--	**544**	--	--	0.070	U	--	--	--	--	**274**	--	--	**124**	--	--	0.100	U	FBK	**58.0**	J	MSD	--	--	--	**87.0**	--	--
YVD-10	YVD-031819-16	3/18/2019	N	988273	**527**	--	--	**527**	--	--	0.070	U	--	--	--	--	**276**	--	--	**141**	--	--	**0.100**	--	--	**58.0**	--	--	--	--	--	**81.6**	--	--
YVD-10	YVD-060319-18	6/3/2019	N	992053	**568**	--	--	**568**	--	--	0.070	U	--	--	--	--	**297**	--	--	**135**	--	--	0.100	U	--	**63.0**	--	--	--	--	--	**74.4**	--	--
YVD-10	YVD-091019-20	9/10/2019	N	998438	**584**	--	--	**584**	--	--	0.070	U	--	--	--	--	**256**	--	--	**92.0**	--	--	0.100	U	--	**54.5**	--	--	--	--	--	**69.0**	--	--
YVD-10	YVD-121019-21	12/10/2019	N	902321	**576**	--	--	**576**	--	--	0.070	U	--	--	--	--	**286**	--	--	**114**	--	--	0.100	U	--	**59.5**	--	--	--	--	--	**84.4**	--	--
YVD-10	YVD-033020-08	3/30/2020	N	006241	**568**	--	--	**568**	--	--	0.070	U	--	--	--	--	**264**	--	--	**104**	--	--	0.100	U	--	**57.0**	--	--	--	--	--	**73.2**	--	--
YVD-10	YVD-060920-12	6/9/2020	N	009269	**586**	--	--	**586**	--	--	0.070	U	--	--	--	--	**293**	--	--	**128**	--	--	0.100	U	--	**62.0**	--	--	--	--	--	**82.6**	--	--
YVD-10	YVD-092020-08	9/20/2020	N	013864	**596**	--	--	**596**	--	--	0.070	U	--	--	--	--	**306**	--	--	**110**	--	--	0.100	U	--	**63.5**	--	--	--	--	--	**76.0**	--	--
YVD-10	YVD-120720-12	12/7/2020	N	017035	**612**	--	--	**612**	--	--	0.070	U	--	--	--	--	**331**	--	--	**161**	--	--	0.100	U	--	**71.0**	--	--	--	--	--	**76.0**	--	--
YVD-10	YVD-030121-12	3/1/2021	N	119931	**770**	--	--	**770**	--	--	0.070	U	--	--	--	--	**482**	--	--	**90.0**	--	--	0.100	U	--	**97.0**	--	--	--	--	--	**44.4**	--	--
YVD-10	YVD-060621-07	6/6/2021	N	124053	**710**	--	--	**710**	--	--	0.070	U	--	--	--	--	**320**	--	--	**85.3**	--	--	**0.490**	--	--	**68.0**	--	--	--	--	--	**53.1**	--	--
YVD-10	YVD-121421-06	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**75.8**	--	--
YVD-10	YVD-031422-06	3/14/2022	N	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**17.7**	--	--
YVD-10	YVD-060522-06	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**55.3**	--	--
YVD-10	YVD-091422-20	9/14/2022	N	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**55.9**	--	--
YVD-10	YVD-120722-11	12/7/2022	N	K2214479	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**68.8**	--	--
YVD-10	YVD-030623-10	3/6/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**60.1**	--	--	--	--	--
YVD-10	YVD-062123-26	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**66.1**	J	HTQ
YVD-10	YVD-091023-03	9/10/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**70.3**	J	HTQ
YVD-10	YVD-091023-05	9/10/2023	FD	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**70.4**	J	HTQ
YVD-11	YVD-11-130923	09/23/2013	N	SWI0178	**254**	J	FDP	**255**	J	FDP	--	--	--	0.100	U	--	**183**	--	--	--	--	--	--	--	--	**51.9**	--	--	--	--	--	--	--	--
YVD-11	YVD-D2-130923	09/23/2013	FD	SWI0178	**199**	J	FDP	**200**	J	FDP	--	--	--	0.100	U	--	**175**	--	--	--	--	--	--	--	--	**46.0**	--	--	--	--	--	--	--	--
YVD-11	YVD-11-130926	09/26/2013	N	SWI0190	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**54.7**	--	--	5.00	U	--	--	--	--	--	--	--	**38.4**	--	--
YVD-11	YVD-D3-130926	09/26/2013	FD	SWI0190	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**61.4**	--	--	5.00	U	--	--	--	--	--	--	--	**46.2**	--	--
YVD-11	YVD-11-131212	12/12/2013	N	SWL0073	**294**	--	--	**295**	--	--	--	--	--	0.020	UJ	MSD	**171**	--	--	**58.7**	--	--	5.00	U	--	**43.4**	--	--	--	--	--	**49.9**	--	--
YVD-11	YVD-11-140318	03/18/2014	N	SXC0107	**324**	--	--	**325**	--	--	--	--	--	0.100	U	--	**183**	--	--	**61.6**	--	--	5.00	U	--	**44.4**	--	--	--	--	--	**43.7**	--	--
YVD-11	YVD-11-140603	06/03/2014	N	SXF0017	**312**	--	--	**313**	--	--	--	--	--	0.100	U	--	**176**	--	--	**67.2**	--	--	5.00	U	--	**50.3**	--	--	--	--	--	**49.1**	--	--
YVD-11	YVD-11-140924	09/24/2014	N	SXI0173	**294**	--	--	**295**	--	--	--	--	--	0.100	U	--	**193**	--	--	**67.2**	--	--	2.50	U	--	**47.9**	--	--	--	--	--	**46.6**	--	--
YVD-11	YVD-11-141217	12/17/2014	N	SXL0121	**289**	--	--	**290**	--	--	--	--	--	0.100	U	--	**198**	--	--	**72.1**	--	--	5.00	U	--	**53.6**	--	--	--	--	--	**49.1**	--	--
YVD-11	YVD-11-150317	03/17/2015	N	5904651	**290**	--	--	**290**	--	--	--	--	--	0.100	U	--	**190**	--	--	**76.0**	--	--	5.00	U	--	**51.0**	--	--	--	--	--	**52.0**	--	--
YVD-11	YVD-11-150616	06/16/2015	N	59010961	**290**	--	--	**290**	--	--	--	--	--	0.100	U	--	**200**	--	--	**86.0**	--	--	5.00	U	--	**50.0**	--	--	--	--	--	**56.0**	--	--
YVD-11	YVD-11-150923	09/23/2015	N	59020281	**310**	--	--	**310**	--	--	--	--	--	**0.120**	--	--	**200**	--	--	**90.0**	--	--	5.00	U	--	**55.0**	--	--	--	--	--	**66.0**	--	--
YVD-11	YVD-11-151215	12/15/2015	N	59025431	**110**	J	FDP	**110**	J	FDP	--	--	--	--	R	MSD	**210**	--	--	**100**	--	--	5.00	U	--	**60.0**	--	--	--	--	--	**74.0**	--	--
YVD-11	YVD-D2-151215	12/15/2015	FD	59025431	**360**	J	FDP	**360**	J	FDP	--	--	--	--	R	MSD	**210**	--	--	**98.0**	--	--	0.500	U	--	**58.0**	--	--	--	--	--	**70.0**	--	--
YVD-11	YVD-11-160309	03/09/2016	N	59029711	**340**	--	--	**340**	--	--	--	--	--	**0.140**	J	FDP	**200**	--	--	**99.0**	--	--	5.00	U	--	**53.0**	--	--	--	--	--	**65.0**	--	--
YVD-11	YVD-11-160621	6/21/2016	N	59037151	**340**	--	--	**340**	--	--	--	--	--	0.100	U	--	**200**	--	--	**120**	--	--	5.00	U	--	**56.0**	--	--	--	--	--	**71.0**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-11	YVD-11-160927	9/27/2016	N	K1611629	**375**	--	--	**375**	--	--	--	--	--	0.050	U	MBK	**204**	--	--	**82.0**	--	--	**0.180**	J	--	**52.6**	--	--	--	--	--	**48.9**	J	HTQ
YVD-11	YVD-11-161214	12/14/2016	N	K1615126	**352**	--	--	**352**	--	--	--	--	--	0.050	U	--	**209**	--	--	**82.5**	--	--	**0.190**	J	--	**57.8**	--	--	--	--	--	**55.5**	--	--
YVD-11	YVD-031317-37	3/13/2017	N	K1702489	**353**	--	--	**353**	--	--	--	--	--	0.050	U	--	**235**	--	--	**102**	--	--	**0.210**	--	--	**62.1**	--	--	--	--	--	**77.3**	--	--
YVD-11	YVD-060517-10	6/5/2017	N	K1705702	**341**	--	--	**341**	--	--	--	--	--	0.050	U	--	**271**	--	--	**129**	--	--	**0.180**	J	--	**69.1**	--	--	--	--	--	**97.1**	--	--
YVD-11	YVD-092617-26	9/26/2017	N	K1710381	**347**	--	--	**347**	--	--	--	--	--	0.050	U	--	**276**	--	--	**135**	--	--	**0.170**	J	--	**68.6**	--	--	--	--	--	**103**	J	HTQ
YVD-11	YVD-120417-06	12/4/2017	N	K1713026	**361**	--	--	**361**	--	--	--	--	--	0.050	U	--	**248**	--	--	**110**	--	--	**0.160**	J	--	**58.6**	--	--	--	--	--	**84.8**	--	--
YVD-11	YVD-031918-12	3/19/2018	N	870634	**386**	--	--	**386**	--	--	0.070	U	--	--	--	--	**223**	--	--	**91.4**	--	--	**0.110**	--	--	**51.5**	--	--	--	--	--	**61.8**	--	--
YVD-11	YVD-031918-14	3/19/2018	FD	870634	**387**	--	--	**387**	--	--	0.070	U	--	--	--	--	**222**	--	--	**89.1**	--	--	**0.120**	--	--	**50.5**	--	--	--	--	--	**61.2**	--	--
YVD-11	YVD-060418-14	6/4/2018	N	874662	**377**	--	--	**377**	--	--	0.340	U	FBK	--	--	--	**224**	--	--	**114**	--	--	**0.120**	--	--	**57.0**	--	--	--	--	--	**68.6**	--	--
YVD-11	YVD-060418-16	6/4/2018	FD	874662	**380**	--	--	**380**	--	--	0.080	U	FBK	--	--	--	**231**	--	--	**114**	--	--	**0.120**	--	--	**57.5**	--	--	--	--	--	**68.2**	--	--
YVD-11	YVD-090918-05	9/9/2018	N	880601	**395**	--	--	**395**	--	--	0.070	U	--	--	--	--	**223**	--	--	**102**	--	--	**0.200**	--	--	**53.0**	--	--	--	--	--	**62.8**	--	--
YVD-11	YVD-121018-10	12/10/2018	N	884857	**410**	--	--	**410**	--	--	0.070	U	--	--	--	--	**182**	--	--	**75.6**	--	--	0.140	U	FBK	**44.9**	J	MSD	--	--	--	**41.1**	--	--
YVD-11	YVD-031819-18	3/18/2019	N	988273	**440**	--	--	**440**	--	--	0.070	U	--	--	--	--	**158**	--	--	**38.6**	--	--	**0.120**	--	--	**38.9**	--	--	--	--	--	**20.2**	--	--
YVD-11	YVD-060219-02	6/2/2019	N	991939	**424**	--	--	**424**	--	--	0.070	U	--	--	--	--	**156**	--	--	49.2	U	FBK	0.590	U	FBK	**38.3**	--	--	--	--	--	**26.4**	--	--
YVD-11	YVD-060219-04	6/2/2019	FD	991939	**423**	--	--	**423**	--	--	0.070	U	--	--	--	--	**156**	--	--	49.8	U	FBK	0.600	U	FBK	**38.7**	--	--	--	--	--	**26.7**	--	--
YVD-11	YVD-090919-05	9/9/2019	N	998357	**423**	--	--	**423**	--	--	0.070	U	--	--	--	--	**164**	--	--	**52.2**	--	--	**0.120**	--	--	**40.0**	--	--	--	--	--	**32.8**	--	--
YVD-11	YVD-120919-13	12/9/2019	N	902276	**429**	--	--	**429**	--	--	0.070	U	--	--	--	--	**162**	--	--	**46.1**	--	--	**0.110**	--	--	**39.7**	--	--	--	--	--	**27.8**	--	--
YVD-11	YVD-033020-10	3/30/2020	N	006241	**426**	--	--	**426**	--	--	0.070	U	--	--	--	--	**150**	--	--	**39.6**	--	--	**0.130**	--	--	**36.6**	--	--	--	--	--	**23.8**	--	--
YVD-11	YVD-061020-31	6/10/2020	N	009361	**420**	--	--	**420**	--	--	0.070	U	--	--	--	--	**151**	--	--	**47.0**	--	--	**0.130**	--	--	**36.6**	J	MS	--	--	--	**24.9**	--	--
YVD-11	YVD-092120-20	9/21/2020	N	013896	**413**	--	--	**413**	--	--	0.070	U	--	--	--	--	**162**	--	--	**69.2**	--	--	**0.120**	--	--	**40.9**	--	--	--	--	--	**37.5**	--	--
YVD-11	YVD-120720-10	12/7/2020	N	017035	**412**	--	--	**412**	--	--	0.070	U	--	--	--	--	**179**	--	--	**78.2**	--	--	**0.240**	--	--	**44.4**	--	--	--	--	--	**48.0**	--	--
YVD-11	YVD-030121-06	3/1/2021	N	119931	**422**	--	--	**422**	--	--	0.070	U	--	--	--	--	**178**	--	--	**85.9**	--	--	**0.170**	--	--	**45.6**	--	--	--	--	--	**44.1**	--	--
YVD-11	YVD-060821-23	6/8/2021	N	124212	**414**	--	--	**414**	--	--	0.070	U	--	--	--	--	**170**	--	--	**85.4**	--	--	**0.110**	--	--	**41.9**	--	--	--	--	--	**41.7**	--	--
YVD-11	YVD-121421-05	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**46.1**	--	--
YVD-11	YVD-031522-19	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**44.6**	--	--
YVD-11	YVD-060622-18	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**82.7**	--	--
YVD-11	YVD-091422-21	9/14/2022	N	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**57.1**	--	--
YVD-11	YVD-120622-06	12/6/2022	N	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**62.5**	--	--
YVD-11	YVD-030623-21	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**58.7**	--	--	--	--	--
YVD-11	YVD-062123-24	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**80.8**	J	HTQ
YVD-11	YVD-091123-11	9/11/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**104**	--	--
YVD-12	YVD-12-130919	09/19/2013	N	SWI0142	**204**	--	--	**205**	--	--	--	--	--	0.100	U	--	**98.6**	--	--	**98.2**	--	--	5.00	U	--	**37.5**	--	--	--	--	--	--	--	--
YVD-12	YVD-12-130925	09/25/2013	N	SWI0175	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**15.0**	--	--
YVD-12	YVD-12-131211	12/11/2013	N	SWL0073	**194**	--	--	**195**	--	--	--	--	--	0.020	UJ	MSD	**93.5**	--	--	**97.0**	--	--	5.00	U	--	**36.2**	--	--	--	--	--	**20.1**	--	--
YVD-12	YVD-12-140318	03/18/2014	N	SXC0095	**204**	--	--	**205**	--	--	--	--	--	**0.248**	--	--	**92.9**	--	--	**95.2**	--	--	5.00	U	--	**35.9**	--	--	--	--	--	**17.0**	--	--
YVD-12	YVD-12-140603	06/03/2014	N	SXF0017	**199**	--	--	**200**	--	--	--	--	--	0.100	U	--	**92.6**	--	--	**8.33**	--	--	0.500	U	--	**34.9**	--	--	--	--	--	**1.44**	--	--
YVD-12	YVD-12-140922	09/22/2014	N	SXI0148	**189**	--	--	**190**	--	--	--	--	--	0.100	U	--	**98.4**	--	--	**78.5**	--	--	5.00	U	--	**39.1**	--	--	--	--	--	**13.3**	--	--
YVD-12	YVD-D2-140922	09/22/2014	FD	SXI0148	**194**	--	--	**195**	--	--	--	--	--	0.100	U	--	**99.3**	--	--	**82.4**	--	--	2.00	U	--	**39.0**	--	--	--	--	--	**15.5**	--	--
YVD-12	YVD-12-141216	12/16/2014	N	SXL0121	**194**	--	--	**195**	--	--	--	--	--	0.100	U	--	**99.3**	--	--	**84.1**	--	--	5.00	U	--	**39.6**	--	--	--	--	--	**15.1**	--	--
YVD-12	YVD-12-150317	03/17/2015	N	5904541	**190**	--	--	**190**	--	--	--	--	--	0.100	U	--	**93.0**	--	--	**75.0**	--	--	5.00	U	--	**37.0**	--	--	--	--	--	**14.0**	J--	MSD
YVD-12	YVD-12-150617	06/17/2015	N	59010961	**190**	--	--	**190**	--	--	--	--	--	0.100	U	--	**90.0**	--	--	**84.0**	--	--	5.00	U	--	**35.0**	--	--	--	--	--	**12.0**	--	--
YVD-12	YVD-12-150924	09/24/2015	N	59020391	**190**	--	--	**190**	--	--	--	--	--	0.100	UJ	MSD	**92.0**	--	--	**78.0**	--	--	5.00	U	--	**39.0**	--	--	--	--	--	**15.0**	J+	MSD
YVD-12	YVD-12-151216	12/16/2015	N	59025501	**210**	--	--	**210**	--	--	--	--	--	--	R	MSD	**95.0**	--	--	**76.0**	--	--	5.00	U	--	**37.0**	--	--	--	--	--	**14.0**	--	--
YVD-12	YVD-12-160309	03/09/2016	N	59029941	**210**	--	--	**210**	--	--	--	--	--	0.100	U	--	**95.0**	--	--	**73.0**	--	--	5.00	U	--	**35.0**	--	--	--	--	--	**13.0**	--	--
YVD-12	YVD-D3-160309	03/09/2016	FD	59029941	**200**	--	--	**200**	--	--	--	--	--	0.100	U	--	**95.0**	--	--	**79.0**	--	--	0.500	U	--	**36.0**	--	--	--	--	--	**15.0**	--	--
YVD-12	YVD-12-160622	6/22/2016	N	59037271	**190**	--	--	**190**	--	--	--	--	--	0.100	UJ	MSD	**89.0**	--	--	**90.0**	--	--	5.00	U	--	**36.0**	--	--	--	--	--	**14.0**	--	--
YVD-12	YVD-12-160929	9/29/2016	N	K1611704	**188**	--	--	**188**	--	--	--	--	--	0.050	U	MBK	**88.9**	--	--	**83.5**	--	--	**0.330**	--	--	**37.2**	--	--	--	--	--	**13.5**	--	--
YVD-12	YVD-12-161213	12/13/2016	N	K1615083	**183**	--	--	**183**	--	--	--	--	--	0.050	U	--	**93.4**	--	--	**81.7**	--	--	**0.330**	--	--	**33.6**	--	--	--	--	--	**12.2**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-12	YVD-030917-20	3/9/2017	N	K1702404	**132**	--	--	**132**	--	--	--	--	--	0.050	U	--	**97.3**	--	--	**91.7**	--	--	**0.380**	--	--	**35.4**	--	--	--	--	--	**13.4**	--	--
YVD-12	YVD-060617-25	6/6/2017	N	K1705833	**183**	--	--	**183**	--	--	--	--	--	0.050	U	--	**98.4**	--	--	**94.1**	--	--	**0.320**	--	--	**35.8**	--	--	--	--	--	**13.6**	--	--
YVD-12	YVD-092517-15	9/25/2017	N	K1710333	**188**	--	--	**188**	--	--	--	--	--	0.050	U	--	**97.6**	--	--	**94.7**	--	--	**0.340**	--	--	**34.2**	--	--	--	--	--	**14.0**	--	--
YVD-12	YVD-120417-03	12/4/2017	N	K1713026	**186**	--	--	**186**	--	--	--	--	--	0.050	U	--	**89.7**	--	--	**85.4**	--	--	**0.410**	--	--	**32.9**	--	--	--	--	--	**13.4**	--	--
YVD-12	YVD-031918-13	3/19/2018	N	870610	**181**	--	--	**181**	--	--	0.070	U	--	--	--	--	**98.0**	--	--	**97.7**	--	--	**0.350**	--	--	**35.3**	--	--	--	--	--	**13.6**	--	--
YVD-12	YVD-060318-11	6/3/2018	N	874568	**178**	--	--	**178**	--	--	0.070	U	FBK	--	--	--	**103**	--	--	**100**	--	--	**0.340**	--	--	**38.4**	--	--	--	--	--	**15.1**	--	--
YVD-12	YVD-090918-16	9/9/2018	N	880601	**185**	--	--	**185**	--	--	0.070	U	--	--	--	--	**110**	--	--	**105**	--	--	**0.330**	--	--	**38.7**	--	--	--	--	--	**15.8**	--	--
YVD-12	YVD-121018-13	12/10/2018	N	884857	**184**	--	--	**184**	--	--	0.070	U	--	--	--	--	**106**	--	--	**98.9**	--	--	0.290	U	FBK	**37.7**	J	MSD	--	--	--	**15.5**	--	--
YVD-12	YVD-031719-07	3/17/2019	N	988239	**189**	--	--	**189**	--	--	0.070	U	--	--	--	--	**104**	--	--	**97.6**	--	--	0.310	U	FBK	**38.0**	--	--	--	--	--	**18.4**	--	--
YVD-12	YVD-060319-27	6/3/2019	N	992053	**185**	--	--	**185**	--	--	0.070	U	--	--	--	--	**104**	--	--	**96.7**	--	--	**0.240**	--	--	**38.1**	--	--	--	--	--	**18.9**	--	--
YVD-12	YVD-090919-16	9/9/2019	N	998357	**185**	--	--	**185**	--	--	0.070	U	--	--	--	--	**106**	--	--	**95.6**	--	--	**0.290**	--	--	**37.5**	--	--	--	--	--	**16.5**	--	--
YVD-12	YVD-120919-12	12/9/2019	N	902276	**190**	--	--	**190**	--	--	**0.300**	--	--	--	--	--	**104**	--	--	**97.8**	--	--	**0.320**	--	--	**38.8**	--	--	--	--	--	**19.6**	--	--
YVD-12	YVD-033020-11	3/30/2020	N	006241	**183**	--	--	**183**	--	--	0.070	U	--	--	--	--	**99.5**	--	--	**99.5**	--	--	**0.320**	--	--	**36.3**	--	--	--	--	--	**17.1**	--	--
YVD-12	YVD-060920-22	6/9/2020	N	009269	**186**	--	--	**186**	--	--	0.070	U	--	--	--	--	**110**	--	--	**101**	--	--	**0.290**	--	--	**38.7**	--	--	--	--	--	**19.5**	--	--
YVD-12	YVD-092120-18	9/21/2020	N	013896	**180**	--	--	**180**	--	--	0.070	U	--	--	--	--	**96.5**	--	--	**99.3**	--	--	**0.270**	--	--	**35.5**	--	--	--	--	--	**13.8**	--	--
YVD-12	YVD-120820-19	12/8/2020	N	017137	**184**	--	--	**184**	--	--	0.070	U	--	--	--	--	**101**	--	--	**114**	--	--	**0.280**	--	--	**36.9**	--	--	--	--	--	**15.2**	--	--
YVD-12	YVD-030221-19	3/2/2021	N	120034	**184**	--	--	**184**	--	--	0.070	U	--	--	--	--	**101**	--	--	**98.1**	--	--	**0.300**	--	--	**36.6**	--	--	--	--	--	**14.8**	--	--
YVD-12	YVD-060821-25	6/8/2021	N	124212	**180**	--	--	**180**	--	--	0.070	U	--	--	--	--	**102**	--	--	**100**	--	--	**0.250**	--	--	**37.0**	--	--	--	--	--	**14.4**	--	--
YVD-12	YVD-121521-18	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**13.4**	J	HTQ, MS
YVD-12	YVD-031522-21	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**14.6**	--	--
YVD-12	YVD-060622-20	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**19.5**	--	--
YVD-12	YVD-091322-09	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**13.8**	--	--
YVD-12	YVD-120822-16	12/8/2022	N	K2214578	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**14.7**	--	--
YVD-12	YVD-030523-02	3/5/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**15.5**	--	--	--	--	--
YVD-12	YVD-062123-31	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**20.5**	J	HTQ
YVD-12	YVD-091123-19	9/11/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**15.7**	--	--
YVD-13	YVD-13-130919	09/19/2013	N	SWI0138	**134**	--	--	**135**	--	--	--	--	--	0.100	U	--	**102**	--	--	**90.3**	--	--	5.00	U	--	**29.9**	--	--	--	--	--	**27.6**	--	--
YVD-13	YVD-13-131211	12/11/2013	N	SWL0073	**139**	--	--	**140**	--	--	--	--	--	0.020	UJ	MSD	**101**	--	--	**77.8**	--	--	5.00	U	--	**29.4**	--	--	--	--	--	**21.7**	--	--
YVD-13	YVD-13-140318	03/18/2014	N	SXC0095	**134**	--	--	**135**	--	--	--	--	--	**0.288**		--	**102**	--	--	**80.3**	--	--	5.00	U	--	**29.3**	--	--	--	--	--	**24.2**	--	--
YVD-13	YVD-13-140603	06/03/2014	N	SXF0017	**129**	--	--	**130**	--	--	--	--	--	**0.103**		--	**94.8**	--	--	**39.7**	--	--	2.00	U	--	**27.7**	--	--	--	--	--	**12.4**	--	--
YVD-13	YVD-13-140923	09/23/2014	N	SXI0173	**124**	--	--	**125**	--	--	--	--	--	0.100	U	--	**104**	--	--	**81.7**	--	--	5.00	U	--	**29.0**	--	--	--	--	--	**26.7**	--	--
YVD-13	YVD-13-141217	12/17/2014	N	SXL0121	**124**	--	--	**125**	--	--	--	--	--	0.100	U	--	**114**	--	--	**86.5**	--	--	5.00	U	--	**33.1**	--	--	--	--	--	**27.3**	--	--
YVD-13	YVD-13-150317	03/17/2015	N	5904541	**130**	--	--	**130**	--	--	--	--	--	0.100	U	--	**100**	--	--	**72.0**	--	--	5.00	U	--	**30.0**	--	--	--	--	--	**24.0**	J--	MSD
YVD-13	YVD-13-150617	06/17/2015	N	59010961	**140**	--	--	**140**	--	--	--	--	--	0.100	U	--	**110**	--	--	**81.0**	--	--	5.00	U	--	**30.0**	--	--	--	--	--	**27.0**	--	--
YVD-13	YVD-13-150924	09/24/2015	N	59020391	**150**	--	--	**150**	--	--	--	--	--	0.100	UJ	MSD	**98.0**	--	--	**70.0**	--	--	5.00	U	--	**31.0**	--	--	--	--	--	**26.0**	J+	MSD
YVD-13	YVD-13-151216	12/16/2015	N	59025501	**140**	--	--	**140**	--	--	--	--	--	--	R	MSD	**100**	--	--	**69.0**	--	--	5.00	U	--	**30.0**	--	--	--	--	--	**26.0**	--	--
YVD-13	YVD-13-160309	03/09/2016	N	59029941	**140**	--	--	**140**	--	--	--	--	--	0.100	U	--	**100**	--	--	**85.0**	--	--	5.00	U	--	**29.0**	--	--	--	--	--	**32.0**	--	--
YVD-13	YVD-13-160622	6/22/2016	N	59037271	**130**	--	--	**130**	--	--	--	--	--	0.100	UJ	MSD	**100**	--	--	**76.0**	--	--	5.00	U	--	**30.0**	--	--	--	--	--	**28.0**	--	--
YVD-13	YVD-13-160928	9/28/2016	N	K1611698	**133**	--	--	**133**	--	--	--	--	--	0.050	U	MBK	**101**	--	--	**60.0**	--	--	**0.300**	--	--	**28.1**	--	--	--	--	--	**23.5**	J	HTQ
YVD-13	YVD-13-161214	12/13/2016	N	K1615083	**132**	--	--	**132**	--	--	--	--	--	0.050	U	--	**100**	--	--	**57.3**	--	--	**0.330**	--	--	**27.5**	--	--	--	--	--	**23.1**	--	--
YVD-13	YVD-030717-08	3/7/2017	N	K1702324	**138**	--	--	**138**	--	--	--	--	--	1.00	U	--	**96.9**	--	--	**52.8**	--	--	**0.350**	--	--	**26.7**	--	--	--	--	--	**23.3**	J	HTQ
YVD-13	YVD-030717-10	3/7/2017	FD	K1702324	**139**	--	--	**139**	--	--	--	--	--	1.00	U	--	**97.3**	--	--	**53.6**	--	--	**0.370**	--	--	**27.1**	--	--	--	--	--	**23.7**	J	HTQ
YVD-13	YVD-060717-33	6/7/2017	N	K1705833	**134**	--	--	**134**	--	--	--	--	--	0.050	U	--	**99.0**	--	--	**54.6**	--	--	**0.300**	--	--	**27.9**	--	--	--	--	--	**22.7**	--	--
YVD-13	YVD-092617-25	9/26/2017	N	K1710333	**142**	--	--	**142**	--	--	--	--	--	0.050	U	--	**94.9**	--	--	**52.8**	--	--	**0.330**	--	--	**24.5**	--	--	--	--	--	**23.2**	--	--
YVD-13	YVD-120417-07	12/4/2017	N	K1713026	**141**	--	--	**141**	--	--	--	--	--	0.050	U	--	**93.4**	--	--	**53.9**	--	--	**0.360**	--	--	**24.5**	--	--	--	--	--	**24.3**	--	--
YVD-13	YVD-031918-19	3/19/2018	N	870634	**138**	--	--	**138**	--	--	0.070	U	--	--	--	--	**96.0**	--	--	**63.0**	--	--	**0.340**	--	--	**25.5**	--	--	--	--	--	**25.8**	--	--
YVD-13	YVD-060318-09	6/3/2018	N	874568	**137**	--	--	**137**	--	--	0.070	U	--	--	--	--	**91.0**	--	--	**63.3**	--	--	**0.350**	--	--	**25.9**	--	--	--	--	--	**25.2**	--	--
YVD-13	YVD-090918-14	9/9/2018	N	880601	**140**	--	--	**140**	--	--	0.070	U	--	--	--	--	**92.0**	--	--	**66.6**	--	--	**0.340**	--	--	**24.6**	--	--	--	--	--	**26.1**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-13	YVD-121018-11	12/10/2018	N	884857	**142**	--	--	**142**	--	--	0.070	U	--	--	--	--	**87.5**	--	--	**70.8**	--	--	0.250	U	FBK	**24.2**	J	MSD	--	--	--	**28.6**	--	--
YVD-13	YVD-031819-15	3/18/2019	N	988273	**153**	--	--	**153**	--	--	0.070	U	--	--	--	--	**91.0**	--	--	**74.4**	--	--	**0.310**	--	--	**24.5**	--	--	--	--	--	**29.1**	--	--
YVD-13	YVD-060319-25	6/3/2019	N	992053	**142**	--	--	**142**	--	--	0.070	U	--	--	--	--	**90.0**	--	--	**40.9**	--	--	**0.230**	--	--	**24.4**	--	--	--	--	--	**28.0**	--	--
YVD-13	YVD-090919-10	9/9/2019	N	998357	**143**	--	--	**143**	--	--	0.070	U	--	--	--	--	**90.0**	--	--	**67.6**	--	--	**0.380**	--	--	**24.0**	--	--	--	--	--	**31.0**	--	--
YVD-13	YVD-120919-10	12/9/2019	N	902276	**138**	--	--	**138**	--	--	0.070	U	--	--	--	--	**88.0**	--	--	**73.4**	--	--	**0.370**	--	--	**24.1**	--	--	--	--	--	**30.9**	--	--
YVD-13	YVD-033020-09	3/30/2020	N	006241	**140**	--	--	**140**	--	--	0.070	U	--	--	--	--	**87.5**	--	--	**77.0**	--	--	**0.340**	--	--	**24.1**	--	--	--	--	--	**30.9**	--	--
YVD-13	YVD-060920-21	6/9/2020	N	009269	**139**	--	--	**139**	--	--	0.070	U	--	--	--	--	**89.5**	--	--	**71.1**	--	--	**0.290**	--	--	**24.6**	--	--	--	--	--	**28.5**	--	--
YVD-13	YVD-092120-13	9/21/2020	N	013896	**138**	--	--	**138**	--	--	0.070	U	--	--	--	--	**92.0**	--	--	**79.7**	--	--	**0.300**	--	--	**25.1**	--	--	--	--	--	**32.3**	--	--
YVD-13	YVD-120820-17	12/8/2020	N	017137	**137**	--	--	**137**	--	--	0.070	U	--	--	--	--	**90.5**	--	--	**64.8**	--	--	**0.330**	--	--	**25.1**	--	--	--	--	--	**27.1**	--	--
YVD-13	YVD-030221-15	3/2/2021	N	120034	**144**	--	--	**144**	--	--	0.070	U	--	--	--	--	**93.5**	--	--	**83.0**	--	--	**0.340**	--	--	**25.5**	--	--	--	--	--	**34.3**	--	--
YVD-13	YVD-060821-32	6/8/2021	N	124212	**142**	--	--	**142**	--	--	0.070	U	--	--	--	--	**92.5**	--	--	**82.8**	--	--	**0.310**	--	--	**25.5**	--	--	--	--	--	**34.0**	--	--
YVD-13	YVD-121521-16	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**34.0**	J	HTQ, MS
YVD-13	YVD-031522-20	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**35.7**	--	--
YVD-13	YVD-060722-24	6/7/2022	N	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**36.2**	J	HTQ
YVD-13	YVD-091322-11	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**35.5**	--	--
YVD-13	YVD-122722-18	12/27/2022	N	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**36.0**	--	--
YVD-13	YVD-030623-08	3/6/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**37.3**	--	--	--	--	--
YVD-13	YVD-030623-09	3/6/2023	FD	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**37.0**	--	--	--	--	--
YVD-13	YVD-062023-14	6/20/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**35.0**	J	HTQ
YVD-13	YVD-091123-21	9/11/2023	N	K2310209	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**36.1**	J	HTQ
YVD-14	YVD-14-130918	09/18/2013	N	SWI0123	**605**	--	--	**605**	--	--	--	--	--	0.100	U	--	**260**	--	--	**118**	--	--	5.00	U	--	**65.4**	--	--	--	--	--	**112**	--	--
YVD-14	YVD-14-131212	12/12/2013	N	SWL0078	**544**	--	--	**545**	--	--	--	--	--	0.020	U	--	**249**	--	--	**104**	--	--	5.00	U	--	**65.6**	--	--	--	--	--	**105**	--	--
YVD-14	YVD-14-140319	03/19/2014	N	SXC0107	**634**	--	--	**635**	--	--	--	--	--	0.100	U	--	**248**	--	--	**108**	--	--	5.00	U	--	**64.5**	--	--	--	--	--	**101**	--	--
YVD-14	YVD-14-140604	06/04/2014	N	SXF0025	**569**	--	--	**570**	--	--	--	--	--	0.100	U	--	**240**	--	--	**109**	--	--	5.00	U	--	**63.2**	--	--	--	--	--	**102**	--	--
YVD-14	YVD-14-140924	09/24/2014	N	SXI0173	**554**	--	--	**555**	--	--	--	--	--	**0.107**	--	--	**268**	--	--	**110**	--	--	5.00	U	--	**72.0**	--	--	--	--	--	**96.7**	--	--
YVD-14	YVD-14-141217	12/17/2014	N	SXL0121	**539**	--	--	**540**	--	--	--	--	--	0.100	U	--	**252**	--	--	**110**	--	--	5.00	U	--	**70.9**	--	--	--	--	--	**96.1**	--	--
YVD-14	YVD-14-150318	03/18/2015	N	5904651	**530**	--	--	**530**	--	--	--	--	--	**0.110**	--	--	**260**	--	--	**110**	--	--	5.00	U	--	**70.0**	--	--	--	--	--	**91.0**	--	--
YVD-14R	YVD-14R-151216	12/16/2015	N	59025501	**550**	--	--	**550**	--	--	--	--	--	--	R	MSD	**250**	--	--	**110**	--	--	5.00	U	--	**69.0**	--	--	--	--	--	**98.0**	--	--
YVD-14R	YVD-14R-160309	03/09/2016	N	59029941	**600**	--	--	**600**	--	--	--	--	--	0.100	U	--	**250**	--	--	**110**	--	--	5.00	U	--	**67.0**	--	--	--	--	--	**100**	--	--
YVD-14R	YVD-14R-160622	6/22/2016	N	59037271	**490**	--	--	**490**	--	--	--	--	--	0.100	UJ	MSD	**230**	--	--	**110**	--	--	5.00	U	--	**67.0**	--	--	--	--	--	**110**	--	--
YVD-14R	YVD-14R-160928	9/28/2016	N	K1611698	**535**	--	--	**535**	--	--	--	--	--	0.050	U	MBK	**252**	--	--	**95.7**	--	--	**0.160**	J	--	**65.9**	--	--	--	--	--	**92.1**	J	HTQ
YVD-14R	YVD-14R-161212	12/12/2016	N	K1615029	**578**	--	--	**578**	--	--	--	--	--	0.050	U	--	**251**	--	--	**94.7**	--	--	**0.240**	--	--	**65.7**	--	--	--	--	--	**92.3**	J	HTQ
YVD-14R	YVD-D1-161212	12/12/2016	FD	K1615029	**571**	--	--	**571**	--	--	--	--	--	0.050	U	--	**255**	--	--	**93.3**	--	--	**0.190**	--	--	**66.5**	--	--	--	--	--	**92.3**	J	HTQ
YVD-14R	YVD-030917-19	3/9/2017	N	K1702404	**526**	--	--	**526**	--	--	--	--	--	0.050	U	--	**257**	--	--	**97.0**	--	--	**0.180**	J	--	**66.1**	--	--	--	--	--	**91.1**	--	--
YVD-14R	YVD-030917-21	3/9/2017	FD	K1702404	**514**	--	--	**514**	--	--	--	--	--	0.050	U	--	**251**	--	--	**95.0**	--	--	**0.190**	J	--	**65.2**	--	--	--	--	--	**92.2**	J	HTQ
YVD-14R	YVD-060517-06	6/5/2017	N	K1705702	**505**	--	--	**505**	--	--	--	--	--	0.050	U	--	**243**	--	--	**98.4**	--	--	**0.200**	--	--	**62.3**	--	--	--	--	--	**95.7**	--	--
YVD-14R	YVD-092517-14	9/25/2017	N	K1710333	**515**	--	--	**515**	--	--	--	--	--	0.050	U	--	**238**	--	--	**99.8**	--	--	**0.180**	J	--	**61.2**	--	--	--	--	--	**97.3**	--	--
YVD-14R	YVD-120417-12	12/4/2017	N	K1713026	**504**	--	--	**504**	--	--	--	--	--	0.050	U	--	**230**	--	--	**98.3**	--	--	**0.220**	--	--	**59.3**	--	--	--	--	--	**96.7**	--	--
YVD-14R	YVD-031818-11	3/18/2018	N	870610	**514**	--	--	**514**	--	--	**0.170**	--	--	--	--	--	**232**	--	--	**102**	--	--	**0.130**	--	--	**60.0**	--	--	--	--	--	**90.2**	--	--
YVD-14R	YVD-060318-04	6/3/2018	N	874568	**521**	--	--	**521**	--	--	0.190	U	FBK	--	--	--	**233**	--	--	**105**	--	--	**0.150**	--	--	**63.0**	--	--	--	--	--	**96.5**	--	--
YVD-14R	YVD-090918-09	9/9/2018	N	880601	**532**	--	--	**532**	--	--	0.070	U	--	--	--	--	**250**	--	--	**115**	--	--	**0.180**	--	--	**63.5**	--	--	--	--	--	**115**	--	--
YVD-14R	YVD-121018-02	12/10/2018	N	884857	**528**	--	--	**528**	--	--	0.070	U	--	--	--	--	**256**	--	--	**133**	--	--	0.150	U	FBK	**66.0**	J	MSD	--	--	--	**117**	--	--
YVD-14R	YVD-121018-04	12/10/2018	FD	884857	**528**	--	--	**528**	--	--	0.070	U	--	--	--	--	**254**	--	--	**132**	--	--	0.150	U	FBK	**66.0**	J	MSD	--	--	--	**115**	--	--
YVD-14R	YVD-031819-12	3/18/2019	N	988273	**531**	--	--	**531**	--	--	0.070	U	--	--	--	--	**277**	--	--	**151**	--	--	**0.440**	J	DUP	**71.5**	--	--	--	--	--	**138**	--	--
YVD-14R	YVD-031819-14	3/18/2019	FD	988273	**532**	--	--	**532**	--	--	0.070	U	--	--	--	--	**275**	--	--	**148**	--	--	**0.130**	J	DUP	**70.5**	--	--	--	--	--	**135**	--	--
YVD-14R	YVD-060319-22	6/3/2019	N	992053	**542**	--	--	**542**	--	--	**0.120**	U	--	--	--	--	**284**	--	--	**149**	--	--	**0.220**	--	--	**73.5**	--	--	--	--	--	**136**	--	--
YVD-14R	YVD-060319-24	6/3/2019	FD	992053	**538**	--	--	**538**	--	--	0.070	U	--	--	--	--	**270**	--	--	**130**	--	--	0.100	U	--	**71.5**	--	--	--	--	--	**138**	--	--
YVD-14R	YVD-090919-13	9/9/2019	N	998357	**560**	--	--	**560**	--	--	0.070	U	--	--	--	--	**280**	--	--	**130**	--	--	**0.130**	--	--	**73.0**	--	--	--	--	--	**140**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-14R	YVD-121019-15	12/10/2019	N	902321	**533**	--	--	**533**	--	--	0.070	U	--	--	--	--	**255**	--	--	**128**	--	--	**0.130**	--	--	**66.5**	--	--	--	--	--	**126**	--	--
YVD-14R	YVD-121019-17	12/10/2019	FD	902321	**543**	--	--	**543**	--	--	0.070	U	--	--	--	--	**256**	--	--	**128**	--	--	**0.130**	--	--	**66.5**	--	--	--	--	--	**125**	--	--
YVD-14R	YVD-033020-02	3/30/2020	N	006241	**555**	--	--	**555**	--	--	0.070	U	--	--	--	--	**262**	--	--	**134**	--	--	**0.130**	--	--	**68.0**	--	--	--	--	--	**126**	--	--
YVD-14R	YVD-033020-04	3/30/2020	FD	006241	**556**	--	--	**556**	--	--	0.070	U	--	--	--	--	**262**	--	--	**132**	--	--	**0.130**	--	--	**68.0**	--	--	--	--	--	**127**	--	--
YVD-14R	YVD-060920-20	6/9/2020	N	009269	**569**	--	--	**569**	--	--	0.070	U	--	--	--	--	**269**	--	--	**149**	--	--	**0.110**	--	--	**70.5**	--	--	--	--	--	**130**	--	--
YVD-14R	YVD-092120-14	9/21/2020	N	013896	**560**	--	--	**560**	--	--	0.070	U	--	--	--	--	**260**	--	--	**141**	--	--	**0.210**	--	--	**68.5**	--	--	--	--	--	**122**	--	--
YVD-14R	YVD-120820-20	12/8/2020	N	017137	**556**	--	--	**556**	--	--	0.070	U	--	--	--	--	**263**	--	--	**148**	--	--	**0.120**	--	--	**68.0**	--	--	--	--	--	**119**	--	--
YVD-14R	YVD-030121-08	3/1/2021	N	119931	**564**	--	--	**564**	--	--	0.070	U	--	--	--	--	**266**	--	--	**139**	--	--	**0.140**	--	--	**70.5**	--	--	--	--	--	**129**	--	--
YVD-14R	YVD-060621-09	6/6/2021	N	124053	**558**	--	--	**558**	--	--	0.070	U	--	--	--	--	**262**	--	--	**131**	--	--	**0.140**	--	--	**68.0**	--	--	--	--	--	**121**	--	--
YVD-14R	YVD-121421-08	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**118**	J	HTQ, MS
YVD-14R	YVD-031422-07	3/14/2022	N	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**134**	--	--
YVD-14R	YVD-060522-09	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**125**	--	--
YVD-14R	YVD-091422-15	9/14/2022	N	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**121**	--	--
YVD-14R	YVD-120822-13	12/8/2022	N	K2214578	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**119**	--	--
YVD-14R	YVD-120822-14	12/8/2022	FD	K2214578	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**118**	--	--
YVD-14R	YVD-030523-03	3/5/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**125**	--	--	--	--	--	--
YVD-14R	YVD-062123-29	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**117**	J	HTQ
YVD-14R	YVD-091123-12	9/11/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**114**	--	--
YVD-15	YVD-15-130917	09/17/2013	N	SWI0123	**514**	--	--	**515**	--	--	--	--	--	0.100	U	--	**125**	--	--	**62.8**	--	--	5.00	U	--	**51.6**	--	--	--	--	--	**72.5**	--	--
YVD-15	YVD-15-131212	12/12/2013	N	SWL0078	**494**	--	--	**495**	--	--	--	--	--	0.020	U	--	**131**	--	--	**120**	--	--	5.00	U	--	**59.4**	--	--	--	--	--	**71.2**	--	--
YVD-15	YVD-15-140319	03/19/2014	N	SXC0107	**534**	--	--	**535**	--	--	--	--	--	**0.112**	--	--	**124**	--	--	**54.9**	--	--	5.00	U	--	**57.9**	--	--	--	--	--	**47.4**	--	--
YVD-15	YVD-15-140603	06/03/2014	N	SXF0025	**509**	--	--	**510**	--	--	--	--	--	0.100	U	--	**138**	--	--	**82.5**	--	--	5.00	U	--	**64.7**	--	--	--	--	--	**88.1**	--	--
YVD-15	YVD-15-140924	09/24/2014	N	SXI0173	**541**	--	--	**545**	--	--	--	--	--	**0.246**	--	--	**132**	--	--	**58.7**	--	--	5.00	U	--	**56.9**	--	--	--	--	--	**54.8**	--	--
YVD-15	YVD-15-141217	12/17/2014	N	SXL0121	**518**	--	--	**520**	--	--	--	--	--	0.100	U	--	**175**	--	--	**57.6**	--	--	5.00	U	--	**81.6**	--	--	--	--	--	**66.9**	--	--
YVD-15	YVD-15-150317	03/17/2015	N	5904651	**550**	--	--	**550**	--	--	--	--	--	0.100	U	--	**280**	--	--	**65.0**	--	--	5.00	U	--	**130**	--	--	--	--	--	**67.0**	--	--
YVD-15	YVD-15-150617	06/17/2015	N	59011021	**550**	--	--	**550**	--	--	--	--	--	0.100	U	--	**140**	--	--	**42.0**	--	--	0.500	U	--	**66.0**	J	RPD	--	--	--	**39.0**	J--	MSD, HTQ
YVD-15	YVD-15-150925	09/25/2015	N	59020431	**480**	--	--	**480**	--	--	--	--	--	0.100	U	--	**98.0**	--	--	**22.0**	--	--	5.00	U	--	**46.0**	--	--	--	--	--	**14.0**	--	--
YVD-15	YVD-15-151215	12/15/2015	N	59025431	**540**	J	FDP	**540**	J	FDP	--	--	--	--	R	MSD	**120**	--	--	**37.0**	--	--	5.00	U	--	**59.0**	--	--	--	--	--	**38.0**	--	--
YVD-15	YVD-15-160309	03/09/2016	N	59029711	**520**	--	--	**520**	--	--	--	--	--	0.100	UJ	FDP	**120**	--	--	**32.0**	--	--	5.00	U	--	**60.0**	--	--	--	--	--	**36.0**	--	--
YVD-15	YVD-15-160621	6/21/2016	N	59037271	**430**	--	--	**430**	--	--	--	--	--	**0.130**	J--	MSD	**110**	--	--	**26.0**	--	--	5.00	U	--	**56.0**	--	--	--	--	--	**31.0**	--	--
YVD-15	YVD-15-160928	9/28/2016	N	K1611629	**401**	--	--	**401**	--	--	--	--	--	0.050	U	MBK	**112**	--	--	**22.5**	--	--	**0.290**	--	--	**50.9**	--	--	--	--	--	**26.6**	--	--
YVD-15	YVD-15-161215	12/15/2016	N	K1615126	**395**	--	--	**395**	--	--	--	--	--	0.050	U	--	**113**	--	--	**22.1**	--	--	**0.320**	--	--	**50.4**	--	--	--	--	--	**25.5**	--	--
YVD-15	YVD-030917-23	3/9/2017	N	K1702404	**395**	--	--	**395**	--	--	--	--	--	0.050	U	--	**119**	--	--	**23.0**	--	--	**0.340**	--	--	**52.9**	--	--	--	--	--	**25.0**	J	HTQ
YVD-15	YVD-060617-20	6/6/2017	N	K1705754	**399**	--	--	**399**	--	--	--	--	--	0.050	U	--	**126**	--	--	**21.8**	--	--	**0.320**	--	--	**54.6**	--	--	--	--	--	**23.0**	--	--
YVD-15	YVD-092517-10	9/25/2017	N	K1710333	**412**	--	--	**412**	--	--	--	--	--	0.050	U	--	**112**	--	--	**22.1**	--	--	**0.350**	--	--	**50.2**	--	--	--	--	--	**21.8**	--	--
YVD-15	YVD-120517-28	12/5/2017	N	K1713091	**414**	--	--	**414**	--	--	--	--	--	0.050	U	--	**112**	--	--	**21.8**	--	--	**0.340**	--	--	**48.0**	--	--	--	--	--	**22.7**	J	HTQ
YVD-15	YVD-031818-09	3/18/2018	N	870610	**397**	--	--	**397**	--	--	0.070	U	--	--	--	--	**104**	--	--	**21.7**	--	--	**0.320**	--	--	**46.6**	--	--	--	--	--	**24.4**	--	--
YVD-15	YVD-060318-08	6/3/2018	N	874568	**401**	--	--	**401**	--	--	0.070	U	FBK	--	--	--	**100**	--	--	**22.0**	--	--	**0.340**	--	--	**45.5**	--	--	--	--	--	**27.0**	--	--
YVD-15	YVD-090918-11	9/9/2018	N	880601	**395**	--	--	**395**	--	--	0.070	U	--	--	--	--	**97.5**	--	--	**22.8**	--	--	**0.350**	--	--	**42.7**	--	--	--	--	--	**24.4**	--	--
YVD-15	YVD-121018-06	12/10/2018	N	884857	**400**	--	--	**400**	--	--	0.070	U	--	--	--	--	**92.5**	--	--	**24.3**	--	--	0.330	U	FBK	**41.0**	J	MSD	--	--	--	**26.3**	--	--
YVD-15	YVD-031719-10	3/17/2019	N	988239	**394**	--	--	**394**	--	--	0.070	U	--	--	--	--	**91.5**	--	--	**21.1**	--	--	0.310	U	FBK	**39.8**	--	--	--	--	--	**24.3**	--	--
YVD-15	YVD-060419-29	6/4/2019	N	992242	**390**	--	--	**390**	--	--	0.070	U	--	--	--	--	**92.0**	--	--	**19.5**	--	--	**0.300**	--	--	**40.8**	--	--	--	--	--	**23.6**	--	--
YVD-15	YVD-090919-11	9/9/2019	N	998357	**407**	--	--	**407**	--	--	0.070	U	--	--	--	--	**91.0**	--	--	**21.8**	--	--	**0.340**	--	--	**39.4**	--	--	--	--	--	**23.4**	--	--
YVD-15	YVD-121019-19	12/10/2019	N	902321	**400**	--	--	**400**	--	--	0.070	U	--	--	--	--	**88.0**	--	--	**20.5**	--	--	**0.370**	--	--	**38.7**	--	--	--	--	--	**23.5**	--	--
YVD-15	YVD-033020-06	3/30/2020	N	006241	**396**	--	--	**396**	--	--	0.070	U	--	--	--	--	**86.5**	--	--	**20.6**	--	--	**0.370**	--	--	**38.3**	--	--	--	--	--	**22.3**	--	--
YVD-15	YVD-060920-16	6/9/2020	N	009269	**397**	--	--	**397**	--	--	0.070	U	--	--	--	--	**86.5**	--	--	**20.8**	--	--	**0.310**	--	--	**38.1**	--	--	--	--	--	**21.0**	--	--
YVD-15	YVD-092020-09	9/20/2020	N	013864	**390**	--	--	**390**	--	--	0.070	U	--	--	--	--	**87.5**	--	--	**21.1**	--	--	**0.310**	--	--	**38.7**	--	--	--	--	--	**21.2**	--	--
YVD-15	YVD-120720-14	12/7/2020	N	017035	**390**	--	--	**390**	--	--	0.070	U	--	--	--	--	**87.0**	--	--	**20.7**	--	--	**0.420**	--	--	**39.0**	--	--	--	--	--	**19.7**	--	--
YVD-15	YVD-030121-14	3/1/2021	N	119931	**397**	--	--	**397**	--	--	0.070	U	--	--	--	--	**87.5**	--	--	**21.1**	--	--	**0.340**	--	--	**39.4**	--	--	--	--	--	**22.0**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-15	YVD-060621-08	6/6/2021	N	124053	**428**	--	--	**428**	--	--	0.070	U	--	--	--	--	**94.5**	--	--	**21.8**	--	--	**0.290**	--	--	**41.7**	--	--	--	--	--	**21.6**	--	--
YVD-15	YVD-121421-07	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**15.1**	--	--
YVD-15	YVD-031422-05	3/14/2022	N	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**34.5**	--	--
YVD-15	YVD-060522-07	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**16.3**	--	--
YVD-15	YVD-091422-19	9/14/2022	N	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**17.3**	--	--
YVD-15	YVD-120622-07	12/6/2022	N	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**16.0**	--	--
YVD-15	YVD-030523-04	3/5/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**11.7**	--	--	--	--	--
YVD-15	YVD-062123-25	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**12.4**	J	HTQ
YVD-15	YVD-091123-20	9/11/2023	N	K2310209	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**13.0**	J	HTQ
YVD-16	YVD-16-130923	09/23/2013	N	SWI0178	**391**	--	--	**391**	--	--	--	--	--	0.100	U	--	**85.0**	--	--	--	--	--	--	--	--	**32.9**	--	--	--	--	--	--	--	--
YVD-16	YVD-16-130926	09/26/2013	N	SWI0190	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**44.1**	--	--	5.00	U	--	--	--	--	--	--	--	**28.8**	--	--
YVD-16	YVD-16-131212	12/12/2013	N	SWL0073	**309**	--	--	**310**	--	--	--	--	--	0.020	UJ	MSD	**87.7**	--	--	**46.7**	--	--	5.00	U	--	**32.1**	--	--	--	--	--	**28.8**	--	--
YVD-16	YVD-16-140318	03/18/2014	N	SXC0107	**298**	--	--	**300**	--	--	--	--	--	0.100	U	--	**105**	--	--	**46.1**	--	--	5.00	U	--	**53.2**	--	--	--	--	--	**23.5**	--	--
YVD-16	YVD-16-140603	06/03/2014	N	SXF0017	**287**	--	--	**288**	--	--	--	--	--	0.100	U	--	**86.3**	--	--	**36.7**	--	--	2.00	U	--	**37.0**	--	--	--	--	--	**21.9**	--	--
YVD-16	YVD-16-140923	09/23/2014	N	SXI0173	**303**	--	--	**305**	--	--	--	--	--	0.100	U	--	**99.2**	--	--	**38.0**	--	--	2.50	U	--	**38.9**	--	--	--	--	--	**21.4**	--	--
YVD-16	YVD-16-141217	12/17/2014	N	SXL0121	**298**	--	--	**300**	--	--	--	--	--	0.100	U	--	**94.9**	--	--	**37.9**	--	--	2.50	U	--	**37.1**	--	--	--	--	--	**20.6**	--	--
YVD-16	YVD-D3-141217	12/17/2014	FD	SXL0121	**308**	--	--	**310**	--	--	--	--	--	0.100	U	--	**92.9**	--	--	**39.9**	--	--	0.500	U	--	**36.2**	--	--	--	--	--	**22.4**	--	--
YVD-16	YVD-16-150317	03/17/2015	N	5904651	**310**	--	--	**310**	--	--	--	--	--	**0.110**	--	--	**93.0**	--	--	**39.0**	--	--	2.50	U	--	**34.0**	--	--	--	--	--	**22.0**	--	--
YVD-16	YVD-16-150616	06/16/2015	N	59010961	**310**	--	--	**310**	--	--	--	--	--	**0.100**	--	--	**96.0**	--	--	**43.0**	--	--	2.50	U	--	**35.0**	--	--	--	--	--	**23.0**	--	--
YVD-16	YVD-16-150923	09/23/2015	N	59020281	**330**	--	--	**330**	--	--	--	--	--	0.100	U	--	**88.0**	--	--	**39.0**	--	--	2.50	U	--	**37.0**	--	--	--	--	--	**23.0**	--	--
YVD-16	YVD-16-151215	12/15/2015	N	59025431	**350**	J	FDP	**350**	J	FDP	--	--	--	--	R	MSD	**89.0**	--	--	**38.0**	--	--	2.50	U	--	**34.0**	--	--	--	--	--	**22.0**	--	--
YVD-16	YVD-16-160309	03/09/2016	N	59029711	**300**	--	--	**300**	--	--	--	--	--	**0.150**	J	FDP	**90.0**	--	--	**39.0**	--	--	2.50	U	--	**36.0**	--	--	--	--	--	**23.0**	--	--
YVD-16	YVD-16-160621	6/21/2016	N	59037151	**300**	--	--	**300**	--	--	--	--	--	0.100	U	--	**85.0**	--	--	**42.0**	--	--	2.50	U	--	**33.0**	--	--	--	--	--	**22.0**	--	--
YVD-16	YVD-D2-160621	6/21/2016	FD	59037151	**300**	--	--	**300**	--	--	--	--	--	0.100	U	--	**86.0**	--	--	**40.0**	--	--	0.500	U	--	**34.0**	--	--	--	--	--	**22.0**	--	--
YVD-16	YVD-16-160928	9/28/2016	N	K1611629	**301**	--	--	**301**	--	--	--	--	--	0.050	U	MBK	**92.4**	--	--	**33.3**	--	--	**0.220**	--	--	**33.2**	--	--	--	--	--	**19.7**	--	--
YVD-16	YVD-16-161215	12/15/2016	N	K1615126	**298**	--	--	**298**	--	--	--	--	--	0.050	U	--	**88.4**	--	--	**33.7**	--	--	**0.240**	--	--	**31.1**	--	--	--	--	--	**19.7**	--	--
YVD-16	YVD-030917-22	3/9/2017	N	K1702404	**295**	--	--	**295**	--	--	--	--	--	0.050	U	--	**87.1**	--	--	**33.9**	--	--	**0.250**	--	--	**31.2**	--	--	--	--	--	**20.1**	J	HTQ
YVD-16	YVD-060517-12	6/5/2017	N	K1705754	**298**	--	--	**298**	--	--	--	--	--	0.050	U	--	**86.8**	--	--	**33.6**	--	--	**0.250**	--	--	**31.6**	--	--	--	--	--	**19.7**	--	--
YVD-16	YVD-092617-28	9/26/2017	N	K1710381	**309**	--	--	**309**	--	--	--	--	--	0.050	U	--	**89.0**	--	--	**32.8**	--	--	**0.230**	--	--	**31.7**	--	--	--	--	--	**19.1**	J	HTQ
YVD-16	YVD-120517-22	12/5/2017	N	K1713091	**294**	--	--	**294**	--	--	--	--	--	0.050	U	--	**87.9**	--	--	**33.3**	--	--	**0.240**	--	--	**30.1**	--	--	--	--	--	**19.8**	J	HTQ
YVD-16	YVD-031918-16	3/19/2018	N	870634	**297**	--	--	**297**	--	--	0.070	U	--	--	--	--	**88.5**	--	--	**34.4**	--	--	**0.200**	--	--	**30.3**	--	--	--	--	--	**20.3**	--	--
YVD-16	YVD-060318-10	6/3/2018	N	874568	**314**	--	--	**314**	--	--	0.070	U	FBK	--	--	--	**90.0**	--	--	**34.9**	--	--	**0.220**	--	--	**32.8**	--	--	--	--	--	**20.7**	--	--
YVD-16	YVD-090918-07	9/9/2018	N	880601	**309**	--	--	**309**	--	--	0.070	U	--	--	--	--	**89.5**	--	--	**35.7**	--	--	**0.210**	--	--	**30.6**	--	--	--	--	--	**21.4**	--	--
YVD-16	YVD-121118-20	12/11/2018	N	884939	**306**	--	--	**306**	--	--	0.070	U	--	--	--	--	**89.5**	--	--	**32.6**	--	--	**0.190**	--	--	**31.1**	--	--	--	--	--	**21.8**	--	--
YVD-16	YVD-031719-08	3/17/2019	N	988239	**300**	--	--	**300**	--	--	0.070	U	--	--	--	--	**88.5**	--	--	**35.4**	--	--	0.180	U	FBK	**30.7**	--	--	--	--	--	**22.5**	--	--
YVD-16	YVD-060219-06	6/2/2019	N	991939	**301**	--	--	**301**	--	--	0.070	U	--	--	--	--	**88.5**	--	--	24.6	U	FBK	0.170	U	FBK	**30.9**	--	--	--	--	--	**23.3**	--	--
YVD-16	YVD-090919-07	9/9/2019	N	998357	**303**	--	--	**303**	--	--	0.070	U	--	--	--	--	**86.5**	--	--	**36.9**	--	--	**0.210**	--	--	**30.4**	--	--	--	--	--	**22.9**	--	--
YVD-16	YVD-120919-11	12/9/2019	N	902276	**296**	--	--	**296**	--	--	0.070	U	--	--	--	--	**86.0**	--	--	**36.7**	--	--	**0.240**	--	--	**30.4**	--	--	--	--	--	**23.5**	--	--
YVD-16	YVD-033120-16	3/31/2020	N	006260	**287**	--	--	**287**	--	--	0.070	U	--	--	--	--	**85.5**	--	--	**38.0**	--	--	**0.180**	--	--	**30.3**	--	--	--	--	--	**22.8**	--	--
YVD-16	YVD-061020-30	6/10/2020	N	009361	**289**	--	--	**289**	--	--	0.070	U	--	--	--	--	**81.5**	--	--	**37.8**	--	--	**0.170**	--	--	**28.8**	J	MS	--	--	--	**21.8**	--	--
YVD-16	YVD-092020-06	9/20/2020	N	013864	**292**	--	--	**292**	--	--	0.070	U	--	--	--	--	**88.0**	--	--	**39.0**	--	--	**0.170**	--	--	**31.4**	--	--	--	--	--	**22.4**	--	--
YVD-16	YVD-120720-08	12/7/2020	N	017035	**298**	--	--	**298**	--	--	0.070	U	--	--	--	--	**92.5**	--	--	**41.2**	--	--	**0.190**	--	--	**33.2**	--	--	--	--	--	**24.6**	--	--
YVD-16	YVD-030121-02	3/1/2021	N	119931	**290**	--	--	**290**	--	--	0.070	U	--	--	--	--	**90.0**	--	--	**42.9**	--	--	**0.200**	--	--	**32.1**	--	--	--	--	--	**24.3**	--	--
YVD-16	YVD-030121-04	3/1/2021	FD	119931	**288**	--	--	**288**	--	--	0.070	U	--	--	--	--	**91.5**	--	--	**42.9**	--	--	**0.200**	--	--	**32.7**	--	--	--	--	--	**24.7**	--	--
YVD-16	YVD-060621-03	6/6/2021	N	124053	**299**	--	--	**299**	--	--	0.070	U	--	--	--	--	**88.5**	--	--	**37.5**	--	--	**0.160**	--	--	**31.9**	--	--	--	--	--	**21.8**	--	--
YVD-16	YVD-121421-02	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**19.7**	J	HTQ, MS
YVD-16	YVD-121421-03	12/14/2021	FD	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**20.1**	--	--
YVD-16	YVD-031522-17	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**21.4**	--	--
YVD-16	YVD-060622-16	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**21.0**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-16	YVD-091322-08	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**22.7**	--	--
YVD-16	YVD-120622-05	12/6/2022	N	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**21.9**	--	--
YVD-16	YVD-030523-05	3/5/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**22.0**	--	--	--	--	--
YVD-16	YVD-030523-06	3/5/2023	FD	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**22.0**	--	--	--	--	--
YVD-16	YVD-062023-13	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**24.8**	J	HTQ
YVD-16	YVD-091123-17	9/11/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**25.3**	--	--
YVD-17	YVD-17-130919	09/19/2013	N	SWI0142	**213**	--	--	**215**	--	--	--	--	--	0.100	U	--	**72.7**	--	--	**3.10**	--	--	0.500	U	--	**35.8**	--	--	--	--	--	--	--	--
YVD-17	YVD-17-130924	09/24/2013	N	SWI0175	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**0.800**	--	--
YVD-17	YVD-17-131210	12/10/2013	N	SWL0055	**169**	--	--	**170**	--	--	--	--	--	0.020	UJ	MSD	**54.2**	--	--	**2.98**	--	--	0.500	U	--	**28.4**	--	--	--	--	--	**0.680**	--	--
YVD-17	YVD-17-140316	03/16/2014	N	SXC0081	**144**	--	--	**145**	--	--	--	--	--	**0.166**	--	--	**36.0**	--	--	**3.45**	--	--	**0.650**	--	--	**17.6**	--	--	--	--	--	**1.07**	--	--
YVD-17	YVD-17-140601	06/01/2014	N	SXF0008	**169**	--	--	**170**	--	--	--	--	--	0.100	U	--	**42.3**	--	--	**3.17**	--	--	0.500	U	--	**18.5**	--	--	--	--	--	**0.670**	--	--
YVD-17	YVD-17-140922	09/22/2014	N	SXI0148	**183**	--	--	**185**	--	--	--	--	--	0.100	U	--	**47.5**	--	--	**2.87**	--	--	0.500	U	--	**21.2**	--	--	--	--	--	**0.960**	--	--
YVD-17	YVD-17-141215	12/15/2014	N	SXL0103	**168**	--	--	**170**	--	--	--	--	--	0.100	U	--	**42.1**	--	--	**2.99**	J+	MSD	0.500	U	--	**17.8**	--	--	--	--	--	**0.660**	J	DUP
YVD-17	YVD-17-150316	03/16/2015	N	5904471	**130**	--	--	**130**	--	--	--	--	--	0.100	U	--	**33.0**	--	--	**3.50**	--	--	**0.500**	--	--	**17.0**	--	--	--	--	--	**1.10**	--	--
YVD-17	YVD-D1-150316	03/16/2015	FD	5904471	**130**	--	--	**130**	--	--	--	--	--	0.100	U	--	**33.0**	--	--	**3.50**	--	--	**0.510**	--	--	**17.0**	--	--	--	--	--	**1.20**	--	--
YVD-17	YVD-17-150617	06/17/2015	N	59010961	**160**	--	--	**160**	--	--	--	--	--	0.100	U	--	**41.0**	--	--	**3.00**	--	--	0.500	U	--	**18.0**	--	--	--	--	--	**0.590**	--	--
YVD-17	YVD-17-150924	09/24/2015	N	59020391	**170**	--	--	**170**	--	--	--	--	--	0.100	UJ	MSD	**40.0**	--	--	**3.10**	--	--	**0.600**	--	--	**18.0**	--	--	--	--	--	0.200	U	--
YVD-17	YVD-17-151216	12/16/2015	N	59025501	**180**	--	--	**180**	--	--	--	--	--	--	R	MSD	**38.0**	--	--	**2.60**	--	--	0.500	U	--	**17.0**	--	--	--	--	--	**0.550**	--	--
YVD-17	YVD-17-160310	03/10/2016	N	59029941	**150**	--	--	**150**	--	--	--	--	--	0.100	U	--	**35.0**	--	--	**2.80**	--	--	0.500	U	--	**16.0**	--	--	--	--	--	**0.320**	--	--
YVD-17	YVD-17-160623	6/23/2016	N	59037371	**170**	--	--	**170**	--	--	--	--	--	--	R	MSD	**39.0**	--	--	**3.40**	--	--	0.500	U	--	**18.0**	--	--	--	--	--	**0.550**	--	--
YVD-17	YVD-17-160926	9/26/2016	N	K1611565	**182**	--	--	**182**	--	--	--	--	--	0.050	U	MBK	**40.8**	--	--	**2.91**	--	--	**0.320**	--	--	**17.3**	--	--	--	--	--	**1.16**	--	--
YVD-17	YVD-17-161215	12/15/2016	N	K1615174	**154**	--	--	**157**	J	--	--	--	--	0.050	U	--	**39.6**	--	--	**2.42**	--	--	**0.340**	--	--	**15.8**	--	--	--	--	--	**0.590**	--	--
YVD-17	YVD-031017-29	3/10/2017	N	K1702448	**142**	--	--	**156**	J	--	--	--	--	0.050	U	--	**36.6**	--	--	**2.65**	--	--	**0.330**	--	--	**15.7**	--	--	--	--	--	**0.420**	--	--
YVD-17	YVD-060617-24	6/6/2017	N	K1705754	**167**	--	--	**167**	--	--	--	--	--	0.050	U	--	**40.2**	--	--	**2.40**	--	--	**0.350**	--	--	**15.8**	--	--	--	--	--	**0.500**	--	--
YVD-17	YVD-092517-08	9/25/2017	N	K1710274	**179**	--	--	**179**	--	--	--	--	--	0.050	U	--	**43.1**	--	--	**2.89**	--	--	**0.370**	--	--	**16.4**	--	--	--	--	--	**0.990**	--	--
YVD-17	YVD-120517-26	12/5/2017	N	K1713091	**187**	--	--	**187**	--	--	--	--	--	0.050	U	--	**43.6**	--	--	**2.71**	--	--	**0.390**	--	--	**15.4**	--	--	--	--	--	**0.710**	--	--
YVD-17	YVD-060418-20	6/4/2018	N	874662	**160**	--	--	**160**	--	--	0.090	U	FBK	--	--	--	**39.1**	--	--	**2.87**	--	--	**0.300**	--	--	**16.5**	--	--	--	--	--	**0.660**	--	--
YVD-17	YVD-060219-12	6/2/2019	N	991939	**149**	--	--	**149**	--	--	0.070	U	--	--	--	--	**35.0**	--	--	2.91	U	FBK	0.240	U	FBK	**15.2**	--	--	--	--	--	**0.490**	--	--
YVD-17	YVD-060820-10	6/8/2020	N	009144	**146**	--	--	**146**	--	--	0.070	U	--	--	--	--	**34.4**	--	--	**3.17**	--	--	**0.250**	--	--	**15.2**	--	--	--	--	--	**0.700**	--	--
YVD-17	YVD-060621-04	6/6/2021	N	124053	**144**	--	--	**144**	--	--	0.070	U	--	--	--	--	**33.3**	--	--	**2.36**	J	FDP	**0.190**	--	--	**14.6**	--	--	--	--	--	**0.400**	--	--
YVD-17	YVD-060621-05	6/6/2021	FD	124053	**144**	--	--	**144**	--	--	0.070	U	--	--	--	--	**33.5**	--	--	**2.99**	J	FDP	**0.240**	--	--	**14.7**	--	--	--	--	--	**0.470**	--	--
YVD-17	YVD-060622-14	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**0.610**	--	--
YVD-17	YVD-062023-15	6/20/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**0.62**	J	HTQ
YVD-18	YVD-18-130919	09/19/2013	N	SWI0142	**119**	--	--	**120**	--	--	--	--	--	0.100	U	--	**42.9**	--	--	**61.4**	--	--	5.00	U	--	**13.7**	--	--	--	--	--	--	--	--
YVD-18	YVD-18-130925	09/25/2013	N	SWI0175	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**13.6**	--	--
YVD-18	YVD-18-131211	12/11/2013	N	SWL0073	**109**	--	--	**110**	--	--	--	--	--	0.020	UJ	MSD	**50.4**	--	--	**62.9**	--	--	5.00	U	--	**17.1**	--	--	--	--	--	**14.2**	J	FDP
YVD-18	YVD-D2-131211	12/11/2013	FD	SWL0073	**114**	--	--	**115**	--	--	--	--	--	0.020	UJ	MSD	**50.2**	--	--	**66.5**	--	--	5.00	U	--	**16.7**	--	--	--	--	--	**23.5**	J	FDP
YVD-18	YVD-18-140318	03/18/2014	N	SXC0095	**119**	--	--	**120**	--	--	--	--	--	**0.134**	J	FDP	**51.7**	--	--	**66.7**	--	--	5.00	U	--	**16.5**	--	--	--	--	--	**18.8**	--	--
YVD-18	YVD-D2-140318	03/18/2014	FD	SXC0095	**124**	--	--	**125**	--	--	--	--	--	**0.280**	J	FDP	**52.0**	--	--	**62.1**	--	--	5.00	U	--	**16.6**	--	--	--	--	--	**17.1**	--	--
YVD-18	YVD-18-140603	06/03/2014	N	SXF0017	**117**	--	--	**118**	--	--	--	--	--	0.100	U	--	**46.8**	--	--	**64.0**	--	--	2.00	U	--	**15.4**	--	--	--	--	--	**16.9**	--	--
YVD-18	YVD-18-140923	09/23/2014	N	SXI0173	**114**	--	--	**115**	--	--	--	--	--	0.100	U	--	**48.5**	--	--	**54.7**	--	--	2.50	U	--	**15.6**	--	--	--	--	--	**13.8**	--	--
YVD-18	YVD-18-141216	12/16/2014	N	SXL0121	**114**	--	--	**115**	--	--	--	--	--	0.100	U	--	**52.7**	--	--	**59.6**	--	--	2.50	U	--	**17.7**	--	--	--	--	--	**16.5**	--	--
YVD-18	YVD-18-150317	03/17/2015	N	5904541	**110**	--	--	**110**	--	--	--	--	--	0.100	U	--	**56.0**	--	--	**64.0**	--	--	2.50	U	--	**19.0**	--	--	--	--	--	**20.0**	J--	MSD
YVD-18	YVD-18-150617	06/17/2015	N	59010961	**110**	--	--	**110**	--	--	--	--	--	0.100	U	--	**55.0**	--	--	**65.0**	--	--	2.50	U	--	**18.0**	--	--	--	--	--	**17.0**	--	--
YVD-18	YVD-18-150924	09/24/2015	N	59020391	**120**	--	--	**120**	--	--	--	--	--	0.100	UJ	MSD	**52.0**	--	--	**63.0**	--	--	2.50	U	--	**19.0**	--	--	--	--	--	**20.0**	J+	MSD
YVD-18	YVD-18-151216	12/16/2015	N	59025501	**120**	--	--	**120**	--	--	--	--	--	--	R	MSD	**60.0**	--	--	**66.0**	--	--	2.50	U	--	**20.0**	--	--	--	--	--	**23.0**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-18	YVD-18-160309	03/09/2016	N	59029941	**120**	--	--	**120**	--	--	--	--	--	0.100	U	--	**62.0**	--	--	**63.0**	--	--	2.50	U	--	**21.0**	--	--	--	--	--	**22.0**	--	--
YVD-18	YVD-18-160622	6/22/2016	N	59037271	**130**	--	--	**130**	--	--	--	--	--	0.100	UJ	MSD	**55.0**	--	--	**61.0**	--	--	2.50	U	--	**19.0**	--	--	--	--	--	**21.0**	--	--
YVD-18	YVD-18-160928	9/28/2016	N	K1611629	**114**	--	--	**114**	--	--	--	--	--	0.050	U	MBK	**58.2**	--	--	**56.8**	--	--	**0.360**	--	--	**19.7**	--	--	--	--	--	**20.5**	--	--
YVD-18	YVD-18-161214	12/14/2016	N	K1615083	**111**	--	--	**111**	--	--	--	--	--	0.050	U	--	**62.5**	--	--	**56.3**	--	--	**0.380**	--	--	**19.6**	--	--	--	--	--	**21.5**	--	--
YVD-18	YVD-D3-161214	12/14/2016	FD	K1615083	**111**	--	--	**111**	--	--	--	--	--	**0.115**	--	--	**60.6**	--	--	**56.4**	--	--	**0.370**	--	--	**20.1**	--	--	--	--	--	**21.5**	--	--
YVD-18	YVD-030617-05	3/6/2017	N	K1702324	**110**	--	--	**110**	--	--	--	--	--	1.00	U	--	**65.4**	--	--	**55.9**	--	--	**0.400**	--	--	**20.5**	--	--	--	--	--	**23.7**	J	HTQ
YVD-18	YVD-060717-31	6/7/2017	N	K1705833	**114**	--	--	**114**	--	--	--	--	--	0.050	U	--	**65.2**	--	--	**57.0**	--	--	**0.340**	--	--	**21.4**	--	--	--	--	--	**22.9**	--	--
YVD-18	YVD-092617-27	9/26/2017	N	K1710333	**115**	--	--	**115**	--	--	--	--	--	0.050	U	--	**58.5**	--	--	**54.8**	--	--	**0.380**	--	--	**18.3**	--	--	--	--	--	**21.6**	--	--
YVD-18	YVD-120417-05	12/4/2017	N	K1713026	**114**	--	--	**114**	--	--	--	--	--	0.050	U	--	**62.6**	--	--	**58.9**	--	--	**0.400**	--	--	**20.0**	--	--	--	--	--	**24.4**	--	--
YVD-18	YVD-031918-17	3/19/2018	N	870634	**111**	--	--	**111**	--	--	0.070	U	--	--	--	--	**67.5**	--	--	**68.2**	--	--	**0.340**	--	--	**22.0**	--	--	--	--	--	**27.7**	--	--
YVD-18	YVD-060318-07	6/3/2018	N	874568	**110**	--	--	**110**	--	--	0.070	U	--	--	--	--	**70.0**	--	--	**65.9**	--	--	**0.330**	--	--	**23.3**	--	--	--	--	--	**26.3**	--	--
YVD-18	YVD-090918-12	9/9/2018	N	880601	**112**	--	--	**112**	--	--	0.070	U	--	--	--	--	**67.5**	--	--	**67.1**	--	--	**0.350**	--	--	**22.1**	--	--	--	--	--	**26.0**	--	--
YVD-18	YVD-121018-09	12/10/2018	N	884857	**115**	--	--	**115**	--	--	0.070	U	--	--	--	--	**68.0**	--	--	**66.8**	--	--	0.320	U	FBK	**22.0**	J	MSD	--	--	--	**27.0**	--	--
YVD-18	YVD-031819-13	3/18/2019	N	988273	**118**	--	--	**118**	--	--	0.070	U	--	--	--	--	**75.0**	--	--	**74.5**	--	--	**0.730**	--	--	**23.7**	--	--	--	--	--	**29.8**	--	--
YVD-18	YVD-060319-23	6/3/2019	N	992053	**118**	--	--	**118**	--	--	0.070	U	--	--	--	--	**75.0**	--	--	**71.0**	--	--	**0.250**	--	--	**23.4**	--	--	--	--	--	**28.4**	--	--
YVD-18	YVD-090919-06	9/9/2019	N	998357	**115**	--	--	**115**	--	--	0.070	U	--	--	--	--	**65.0**	--	--	**61.5**	--	--	**0.380**	--	--	**20.7**	--	--	--	--	--	**28.4**	--	--
YVD-18	YVD-090919-08	9/9/2019	FD	998357	**114**	--	--	**114**	--	--	0.070	U	--	--	--	--	**65.5**	--	--	**60.9**	--	--	**0.380**	--	--	**20.8**	--	--	--	--	--	**28.3**	--	--
YVD-18	YVD-120919-08	12/9/2019	N	902276	**113**			**113**			0.070	U		--	--	--	**70.0**			**68.1**			**0.340**			**23.0**			--	--	--	**28.8**		
YVD-18	YVD-033020-07	3/30/2020	N	006241	**117**	--	--	**117**	--	--	0.070	U	--	--	--	--	**73.5**	--	--	**71.6**	--	--	**0.300**	--	--	**23.3**	--	--	--	--	--	**28.5**	--	--
YVD-18	YVD-060920-19	6/9/2020	N	009269	**120**	--	--	**120**	--	--	0.070	U	--	--	--	--	**70.5**	--	--	**69.1**	--	--	**0.290**	--	--	**22.5**	--	--	--	--	--	**27.4**	--	--
YVD-18	YVD-092120-15	9/21/2020	N	013896	**115**	--	--	**115**	--	--	0.070	U	--	--	--	--	**67.0**	--	--	**70.9**	--	--	**0.310**	--	--	**21.6**	--	--	--	--	--	**27.4**	--	--
YVD-18	YVD-092120-17	9/21/2020	FD	013896	**113**	--	--	**113**	--	--	0.070	U	--	--	--	--	**65.5**	--	--	**70.4**	--	--	**0.310**	--	--	**21.2**	--	--	--	--	--	**27.2**	--	--
YVD-18	YVD-120820-15	12/8/2020	N	017137	**116**	--	--	**116**	--	--	0.070	U	--	--	--	--	**71.0**	--	--	**64.8**	--	--	**0.420**	--	--	**22.7**	--	--	--	--	--	**26.6**	--	--
YVD-18	YVD-030221-17	3/2/2021	N	120034	**122**	--	--	**122**	--	--	0.070	U	--	--	--	--	**76.0**	--	--	**72.2**	--	--	**0.310**	--	--	**23.7**	--	--	--	--	--	**28.2**	--	--
YVD-18	YVD-060821-30	6/8/2021	N	124212	**120**	--	--	**120**	--	--	0.070	U	--	--	--	--	**71.0**	--	--	**75.8**	--	--	**0.310**	--	--	**22.8**	--	--	--	--	--	**31.8**	--	--
YVD-18	YVD-121521-12	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**26.6**	J	HTQ,
YVD-18	YVD-121521-14	12/15/2021	FD	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**26.7**	J	HTQ, MS,
YVD-18	YVD-031522-18	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**30.0**	--	--
YVD-18	YVD-060722-25	6/7/2022	N	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**30.9**	J	HTQ
YVD-18	YVD-060722-26	6/7/2022	FD	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**30.5**	J	HTQ
YVD-18	YVD-091322-13	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**27.6**	--	--
YVD-18	YVD-122722-16	12/27/2022	N	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**28.1**	--	--
YVD-18	YVD-122722-17	12/27/2022	FD	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**28.6**	--	--
YVD-18	YVD-030623-11	3/6/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**33.1**	--	--	--	--	--
YVD-18	YVD-062023-16	6/20/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**32.1**	J	HTQ
YVD-18	YVD-091123-23	9/11/2023	N	K2310209	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**28.4**	J	HTQ
Equipment Blank	YVD-EB-130918	09/18/2013	EB	SWI0123	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Equipment Blank	YVD-EB-130925	09/25/2013	EB	SWI0175	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Equipment Blank	YVD-EB-131212	12/12/2013	EB	SWL0078	4.00	U	--	4.00	U	--	0.020	U	--	0.020	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Equipment Blank	YVD-EB-140317	03/17/2014	EB	SXC0081	4.00	U	--	4.00	U	--	**0.124**	--	--	**0.124**	--	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Equipment Blank	YVD-EB-140318	03/18/2014	EB	SXC0095	4.00	U	--	4.00	U	--	**0.130**	--	--	**0.130**	--	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Equipment Blank	YVD-EB-140319	03/19/2014	EB	SXC0107	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Equipment Blank	YVD-EB-140604	06/04/2014	EB	SXF0025	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	**1.46**	--	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
Equipment Blank	YVD-EB-140924	09/24/2014	EB	SXI0173	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Equipment Blank	YVD-EB-141217	12/17/2014	EB	SXL0144	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	**0.900**	--	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Equipment Blank	YVD-EB-150617	06/17/2015	EB	59011021	**5.00**	--	--	**5.00**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Equipment Blank	YVD-EB-150925	09/25/2015	EB	59020431	4.00	U	--	4.00	U	--	**0.100**	--	--	**0.100**	--	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Equipment Blank	YVD-EB-151216	12/16/2015	EB	59025501	**5.00**	--	--	**5.00**	--	--	**0.120**	J--	MSD	**0.120**	J--	MSD	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Equipment Blank	YVD-EB-160310	03/10/2016	EB	59029941	**15.0**	--	--	**15.0**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	**1.10**	--	--	**0.670**	--	--	0.500	U	--	--	--	--	0.200	U	--
Equipment Blank	YVD-EB-160623	6/23/2016	EB	59037371	**5.00**	--	--	**5.00**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Equipment Blank	YVD-EB-160926	9/26/2016	EB	K1611506	2.00	U	--	2.00	U	--	0.050	U	MBK	0.050	U	MBK	**0.097**	--	--	0.200	U	--	0.200	U	--	**0.035**	--	--	--	--	--	0.100	U	--
Equipment Blank	YVD-EB-160927	9/27/2016	EB	K1611629	2.00	U	--	2.00	U	--	0.050	U	MBK	0.050	U	MBK	**0.011**	J	--	0.100	U	--	0.100	U	--	**0.000**	J	--	--	--	--	0.050	UJ	HTQ
Equipment Blank	YVD-EB-160928	9/28/2016	EB	K1611629	2.00	U	--	2.00	U	--	0.050	U	MBK	0.050	U	MBK	**0.050**	J	--	**0.030**	J	--	0.100	U	--	0.050	U	--	--	--	--	0.050	U	--
Equipment Blank	YVD-EB1-161214	12/14/2016	EB	K1615083	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Equipment Blank	YVD-EB2-161215	12/15/2016	EB	K1615126	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Equipment Blank	YVD-EB3-161216	12/16/2016	EB	K1615174	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.035	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-F1-130916	09/16/2013	FB	SWI0113	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F2-130917	09/17/2013	FB	SWI0113	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F3-130918	09/18/2013	FB	SWI0123	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F4-130918	09/18/2013	FB	SWI0138	4.00	U	--	4.00	U	--	**0.120**	--	--	**0.120**	--	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F5-130919	09/19/2013	FB	SWI0142	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	--	--	--
Field Blank	YVD-F6-130923	09/23/2013	FB	SWI0178	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	--	--	--	--	--	--	0.500	U	--	--	--	--	--	--	--
Field Blank	YVD-F7-130924	09/24/2013	FB	SWI0175	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F7-130926	09/26/2013	FB	SWI0190	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.800	U	--	0.500	U	--	--	--	--	--	--	--	0.200	U	--
Field Blank	YVD-F1-131209	12/09/2013	FB	SWL0055	4.00	U	--	4.00	U	--	0.020	U	--	0.020	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F2-131210	12/10/2013	FB	SWL0063	4.00	U	--	4.00	U	--	0.020	U	--	0.020	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F3-131211	12/11/2013	FB	SWL0073	4.00	U	--	4.00	U	--	0.020	U	--	0.020	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F4-131212	12/12/2013	FB	SWL0078	4.00	U	--	4.00	U	--	0.020	U	--	0.020	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F1-140316	03/16/2014	FB	SXC0081	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F2-140317	03/17/2014	FB	SXC0095	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F3-140318	03/18/2014	FB	SXC0107	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F4-140319	03/19/2014	FB	SXC0107	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F1-140601	06/01/2014	FB	SXF0008	**4.25**	--	--	**4.25**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F2-140602	06/02/2014	FB	SXF0017	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F3-140603	06/03/2014	FB	SXF0025	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F1-140921	09/21/2014	FB	SXI0148	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F2-140922	09/22/2014	FB	SXI0148	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F3-140923	09/23/2014	FB	SXI0158	4.00	U	--	4.00	U	--	**0.128**	--	--	**0.128**	--	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F4-140924	09/24/2014	FB	SXI0173	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F1-141215	12/15/2014	FB	SXL0103	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	UJ	DUP
Field Blank	YVD-F2-141215	12/15/2014	FB	SXL0108	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F3-141216	12/16/2014	FB	SXL0121	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F4-141217	12/17/2014	FB	SXL0144	4.00	U	--	4.00	U	--	**0.101**	--	--	**0.101**	--	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	--	R	HTQ

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
Field Blank	YVD-F1-150315	03/15/2015	FB	5904471	**15.0**	--	--	**15.0**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F2-150316	03/16/2015	FB	5904541	**7.50**	--	--	**7.50**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F3-150317	03/17/2015	FB	5904651	**4.50**	--	--	**4.50**	--	--	0.100	U	--	0.100	U	--	**1.20**	--	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F1-150615	06/15/2015	FB	59010751	**10.0**	--	--	**10.0**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F2-150616	06/16/2015	FB	59010961	**5.00**	--	--	**5.00**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F3-150617	06/17/2015	FB	59011021	**5.00**	--	--	**5.00**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F1-150922	09/22/2015	FB	59020141	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F2-150923	09/23/2015	FB	59020281	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F3-150923	09/23/2015	FB	59020391	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F4-150924	09/24/2015	FB	59020391	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F5-150925	09/25/2015	FB	59020431	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F1-151213	12/13/2015	FB	59025351	**5.00**	--	--	**5.00**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F2-151214	12/14/2015	FB	59025431	**5.00**	--	--	**5.00**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F3-151215	12/15/2015	FB	59025501	**5.00**	--	--	**5.00**	--	--	--	R	MSD	--	R	MSD	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F4-151216	12/16/2015	FB	59025501	**5.00**	--	--	**5.00**	--	--	--	R	MSD	--	R	MSD	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F1-160307	03/07/2016	FB	59029521	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F2-160308	03/08/2016	FB	59029711	4.00	U	--	4.00	U	--	**0.190**	--	--	**0.190**	--	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F3-160309	03/09/2016	FB	59029941	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F4-160310	03/10/2016	FB	59029941	**13.0**	--	--	**13.0**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F1-160620	6/20/2016	FB	59037101	**5.00**	--	--	**5.00**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F2-160621	6/21/2016	FB	59037151	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F3-160622	6/22/2016	FB	59037271	**5.00**	--	--	**5.00**	--	--	**0.220**	--	--	**0.220**	--	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F4-160623	6/23/2016	FB	59037371	**10.0**	--	--	**10.0**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-FB-160926	9/26/2016	FB	K1611506	2.00	U	--	2.00	U	--	0.050	U	MBK	0.050	U	MBK	0.020	U	MBK	0.200	U	--	0.200	U	--	**0.003**	J	--	--	--	--	0.100	U	--
Field Blank	YVD-FB-160927	9/27/2016	FB	K1611565	2.00	U	--	2.00	U	--	0.050	U	MBK	0.050	U	MBK	0.020	U	MBK	0.200	U	--	0.200	U	--	0.050	U	--	--	--	--	0.100	U	--
Field Blank	YVD-FB-160928	9/28/2016	FB	K1611629	15.0	U	--	15.0	U	--	0.050	U	MBK	0.050	U	MBK	**0.050**	J	--	0.100	U	--	0.100	U	--	0.050	U	--	--	--	--	0.050	U	--
Field Blank	YVD-FB-160929	9/29/2016	FB	K1611698	2.00	U	--	2.00	U	--	0.050	U	MBK	0.050	U	MBK	**0.070**	J	--	0.200	U	--	0.200	U	--	0.050	U	--	--	--	--	0.100	U	--
Field Blank	YVD-FB1-161212	12/12/2016	FB	K1615029	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	HTQ
Field Blank	YVD-FB2-161213	12/13/2016	FB	K1615045	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-FB3-161214	12/14/2016	FB	K1615083	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	--	--	--	--	0.100	U	--
Field Blank	YVD-FB4-161215	12/15/2016	FB	K1615126	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-FB5-161216	12/16/2016	FB	K1615174	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-030617-01	3/6/2017	FB	K1702228	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-030717-06	3/7/2017	FB	K1702324	2.00	U	--	2.00	U	--	1.00	U	--	1.00	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	UJ	HTQ
Field Blank	YVD-030817-11	3/8/2017	FB	K1702324	2.00	U	--	2.00	U	--	1.00	U	--	1.00	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-030917-17	3/9/2017	FB	K1702404	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-031017-26	3/10/2017	FB	K1702448	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-031317-30	3/13/2017	FB	K1702489	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-060417-01	6/4/2017	FB	K1705702	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.025	U	MBK	21.000	U	--	0.200	U	--	0.005	U	MBK	--	--	--	5.30	U	--
Field Blank	YVD-060517-07	6/5/2017	FB	K1705702	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.029	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-060617-17	6/6/2017	FB	K1705754	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-060717-28	6/7/2017	FB	K1705833	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-092517-01	9/25/2017	FB	K1710274	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	**0.002**	J	--	--	--	--	0.100	U	--
Field Blank	YVD-092617-16	9/26/2017	FB	K1710333	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.026	U	MBK	0.200	U	--	0.200	U	--	0.008	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-120417-01	12/4/2017	FB	K1713026	15.0	U	MBK	15.0	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-120517-32	12/5/2017	FB	K1713091	15.0	U	MBK	15.0	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	**0.420**	--	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	HTQ
Field Blank	YVD-120617-25	12/6/2017	FB	K1713157	15.0	U	MBK	15.0	U	--	0.050	U	MBK	0.050	U	MBK	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-031818-01	3/18/2018	FB	870610	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-031918-10	3/19/2018	FB	870634	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-060318-01	6/3/2018	FB	874568	5.00	U	--	5.00	U	--	**0.180**	--	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
Field Blank	YVD-060418-12	6/4/2018	FB	874568	5.00	U	--	5.00	U	--	**0.080**	--	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-060518-26	6/5/2018	FB	874860	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-061218-33	6/12/2018	FB	875438	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-090918-01	9/9/2018	FB	880601	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-121018-01	12/10/2018	FB	884857	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	**0.280**	--	--	**0.100**	--	--	0.060	UJ	MSD	--	--	--	0.050	U	--
Field Blank	YVD-121118-12	12/11/2018	FB	884939	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	**0.140**	--	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-031719-01	3/17/2019	FB	988239	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	**0.220**	--	--	0.120	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-031819-11	3/18/2019	FB	988273	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-032019-20	3/20/2019	FB	988477	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-060219-01	6/2/2019	FB	991939	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	**11.0**	--	--	**0.630**	--	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-060319-13	6/3/2019	FB	992053	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	**0.310**	--	--	0.100	U	--	0.060	U	--	--	--	--	**0.080**	--	--
Field Blank	YVD-060419-26	6/4/2019	FB	992242	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-090919-01	9/9/2019	FB	998357	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-090919-03	9/9/2019	FB	998357	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-091019-15	9/10/2019	FB	998438	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-091019-17	9/10/2019	FB	998438	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-120919-01	12/9/2019	FB	902276	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-120919-09	12/9/2019	FB	902276	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-121019-16	12/10/2019	FB	902321	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-121019-18	12/10/2019	FB	902321	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-033020-01	3/30/2020	FB	006241	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-033020-03	3/30/2020	FB	006241	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-033120-13	3/31/2020	FB	006260	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-033120-15	3/31/2020	FB	006260	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-060820-01	6/8/2020	FB	009144	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-060820-02	6/8/2020	FB	009144	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-060920-11	6/9/2020	FB	009269	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-060920-13	6/9/2020	FB	009269	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-061020-29	6/10/2020	FB	009361	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-061020-28	6/10/2020	FB	009361	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-092020-01	9/20/2020	FB	013864	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-092020-02	9/20/2020	FB	013864	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-092120-10	9/21/2020	FB	013896	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-092120-12	9/21/2020	FB	013896	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-120720-01	12/7/2020	FB	017035	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-120720-03	12/7/2020	FB	017035	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-120820-16	12/8/2020	FB	017137	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-120820-18	12/8/2020	FB	017137	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-030121-01	3/1/2021	FB	119931	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-030121-03	3/1/2021	FB	119931	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-030221-11	3/2/2021	FB	120034	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-030221-13	3/2/2021	FB	120034	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-060621-01	6/6/2021	FB	124053	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-060621-02	6/6/2021	FB	124053	--	--	--	--	--	--	0.070	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-060721-11	6/7/2021	FB	124105	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-060721-12	6/7/2021	FB	124105	--	--	--	--	--	--	0.070	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-060821-20	6/8/2021	FB	124212	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-060821-21	6/8/2021	FB	124212	--	--	--	--	--	--	0.070	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-121421-01	12/14/2021	FB	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.100	U	--
Field Blank	YVD-121521-13	12/15/2021	FB	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.100	UJ	ERL

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			SM 4500 NH3--G			EPA 350.1			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
Field Blank	YVD-031422-01	3/14/2022	FB	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.050	UJ	ERL
Field Blank	YVD-031522-09	3/15/2022	FB	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.050	U	--
Field Blank	YVD-060522-01	6/5/2022	FB	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.100	U	--
Field Blank	YVD-060622-13	6/6/2022	FB	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.100	U	--
Field Blank	YVD-060722-23	6/7/2022	FB	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.100	UJ	HTQ
Field Blank	YVD-060822-33	6/8/2022	FB	K2206299	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.250	U	--
Field Blank	YVD-091322-01	9/13/2022	FB	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.100	U	--
Field Blank	YVD-091422-14	9/14/2022	FB	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.100	U	--
Field Blank	YVD-120622-01	12/6/2022	FB	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.100	U	--
Field Blank	YVD-120722-08	12/7/2022	FB	K2214479	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.100	U	--
Field Blank	YVD-120822-12	12/8/2022	FB	K2214578	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.100	U	MBK
Field Blank	YVD-122722-22	12/27/2022	FB	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.100	U	--
Field Blank	YVD-030523-01	3/5/2023	FB	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.050	U	--	--	--	--
Field Blank	YVD-030623-07	3/6/2023	FB	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.050	U	--	--	--	--
Field Blank	YVD-061923-01	6/19/2023	FB	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.10	UJ	HTQ
Field Blank	YVD-062023-05	6/20/2023	FB	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.10	UJ	HTQ
Field Blank	YVD-062123-21	6/21/2023	FB	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.10	UJ	HTQ
Field Blank	YVD-091023-02	9/10/2023	FB	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.10	UJ	HTQ
Field Blank	YVD-091123-08	9/11/2023	FB	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.10	UJ	HTQ
Blank Check	WW-1	4/25/2016	BC	59032861	**110**	--	--	**110**	--	--	**0.330**	--	--	**0.330**	--	--	1.70	U	--	160	U	--	100	U	--	0.830	U	--	--	--	--	40.0	U	--
Blank Check	DW-1	4/25/2016	BC	59032861	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Blank Check	DI-1	4/25/2016	BC	59032861	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-01	DC-01-130104	01/04/2013	N	EPA01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-01	DC-01-130924	09/24/2013	N	SWI0178	0.200	U	--	0.250	U	--	--	--	--	--	--	--	**0.123**	--	--	--	--	--	**6.10**	--	--	**43.0**	--	--	**223**	--	--
DC-01	DC-01-131211	12/11/2013	N	SWL0063	2.00	U	--	0.200	U	--	--	--	--	--	--	--	--	--	--	**0.186**	--	--	**5.94**	--	--	**41.9**	--	--	**280**	J--	MSD
DC-01	DC-01-140318	03/18/2014	N	SXC0095	2.00	U	--	**0.304**	--	--	**0.079**	--	--	--	--	--	--	--	--	--	--	--	**5.93**	--	--	**40.2**	--	--	**250**	J--	MSD
DC-01	DC-01-140602	06/02/2014	N	SXF0017	0.800	U	--	**0.450**	--	--	**0.810**	--	--	--	--	--	--	--	--	--	--	--	**6.74**	--	--	**41.8**	--	--	**224**	J--	MSD
DC-01	DC-01-140923	09/23/2014	N	SXI0158	2.00	U	--	0.250	U	--	**0.120**	--	--	--	--	--	--	--	--	--	--	--	**6.02**	--	--	**44.3**	J+	MSD	**216**	--	--
DC-01	DC-01-141216	12/16/2014	N	SXL0121	2.00	U	--	0.250	UJ	MSD	0.100	U	--	--	--	--	--	--	--	--	--	--	**6.18**	--	--	**43.1**	--	--	**463**	--	--
DC-01	DC-01-150316	03/16/2015	N	5904471	2.00	U	--	0.250	UJ	MSD	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**6.50**	--	--	**44.0**	--	--	**220**	--	--
DC-01	DC-01-150616	06/16/2015	N	59010751	2.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**6.20**	J+	MSD	**42.0**	J+	MSD	**200**	J--	MSD
DC-01	DC-01-150923	09/23/2015	N	59020281	2.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**6.00**	--	--	**43.0**	--	--	**200**	--	--
DC-01	YVD-D1-150923	09/23/2015	FD	59020281	0.200	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**6.10**	--	--	**43.0**	--	--	**210**	--	--
DC-01	DC-01-151214	12/14/2015	N	59025431	2.00	U	--	--	R	MSD	**0.300**	J	FDP	--	--	--	--	--	--	--	--	--	**6.80**	--	--	**48.0**	--	--	**220**	--	--
DC-01	DC-01-160308	03/08/2016	N	59029711	2.00	U	--	--	R	MSD	**0.260**	--	--	--	--	--	--	--	--	--	--	--	**6.20**	--	--	**42.0**	--	--	**210**	J+	MSD
DC-01	DC-01-160620	6/20/2016	N	59037101	2.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**6.50**	--	--	**46.0**	--	--	**220**	J--	MSD
DC-01	DC-01-160928	9/28/2016	N	K1611629	0.100	U	--	0.500	U	--	--	--	--	**0.009**	J	--	--	--	--	--	--	--	**5.76**	--	--	**41.6**	--	--	**193**	--	--
DC-01	DC-01-161212	12/12/2016	N	K1615045	0.100	UJ	HTQ	0.500	U	--	--	--	--	**0.040**	--	--	--	--	--	--	--	--	**5.52**	--	--	**40.4**	--	--	**191**	--	--
DC-01	YVD-030817-18	3/8/2017	N	K1702324	0.100	U	--	0.500	U	--	--	--	--	**0.008**	J	--	--	--	--	--	--	--	**5.13**	--	--	**37.4**	--	--	**175**	--	--
DC-01	YVD-060417-03	6/4/2017	N	K1705702	0.100	U	--	0.500	U	--	--	--	--	**0.010**	J	--	--	--	--	--	--	--	**5.22**	--	--	**37.4**	--	--	**203**	--	--
DC-01	YVD-060417-05	6/4/2017	FD	K1705702	0.100	U	--	0.500	U	--	--	--	--	**0.010**	J	--	--	--	--	--	--	--	**5.08**	--	--	**36.9**	--	--	**203**	--	--
DC-01	YVD-092517-13	9/25/2017	N	K1710333	0.100	U	--	0.500	U	--	--	--	--	0.010	U	--	--	--	--	--	--	--	**5.31**	--	--	**39.1**	--	--	**194**	--	--
DC-01	YVD-120617-31	12/6/2017	N	K1713157	0.100	U	--	0.500	U	--	--	--	--	**0.010**	--	--	--	--	--	--	--	--	**5.56**	--	--	**40.6**	--	--	**182**	--	--
DC-01	YVD-060418-19	6/4/2018	N	874662	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.80**	--	--	**42.4**	--	--	**171**	--	--
DC-01	YVD-060219-03	6/2/2019	N	991939	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.50**	--	--	**39.0**	--	--	**168**	--	--
DC-01	YVD-060820-07	6/8/2020	N	009144	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	**0.160**	--	--	**5.80**	--	--	**40.7**	--	--	**164**	--	--
DC-01	YVD-060721-10	6/7/2021	N	124105	0.050	U	--	5.00	UJ	MS, RPD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.30**	--	--	**36.4**	--	--	**136**	--	--
DC-01	YVD-060622-15	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-01	YVD-061923-02	6/19/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03	DC-03-130102	01/02/2013	N	EPA01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03	DC-03-130918	09/18/2013	N	SWI0138	2.00	U	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	**2.73**	--	--	**173**	--	--	**176**	--	--
DC-03	DC-03-131212	12/12/2013	N	SWL0078	2.00	U	--	0.200	U	--	--	--	--	--	--	--	--	--	--	**0.221**	--	--	**3.29**	--	--	**172**	--	--	**176**	--	--
DC-03	YVD-D3-131212	12/12/2013	FD	SWL0078	2.00	U	--	0.831	U	ERL	--	--	--	--	--	--	--	--	--	**0.244**	--	--	**3.53**	--	--	**181**	--	--	**160**	--	--
DC-03	DC-03-140319	03/19/2014	N	SXC0107	2.00	U	--	**0.938**	J--	MSD	**0.057**	--	--	--	--	--	--	--	--	--	--	--	**2.91**	--	--	**165**	--	--	**189**	J	FDP
DC-03	YVD-D3-140319	03/19/2014	FD	SXC0107	2.00	U	--	**0.718**	J--	MSD	**0.062**	--	--	--	--	--	--	--	--	--	--	--	**2.81**	--	--	**166**	--	--	**150**	J	FDP
DC-03	DC-03-140604	06/04/2014	N	SXF0025	4.00	U	--	0.250	UJ	MSD	**0.120**	--	--	--	--	--	--	--	--	--	--	--	**3.11**	--	--	**177**	--	--	**214**	--	--
DC-03	DC-03-140924	09/24/2014	N	SXI0173	2.00	U	--	**2.27**	J+	MSD	**0.073**	J+	FBK	--	--	--	--	--	--	--	--	--	**3.28**	--	--	**178**	--	--	**166**	--	--
DC-03	DC-03-141217	12/17/2014	N	SXL0144	4.00	U	--	--	R	MSD	0.100	UJ	MSD	--	--	--	--	--	--	--	--	--	**3.76**	--	--	**185**	--	--	**182**	--	--
DC-03	YVD-D4-141217	12/17/2014	FD	SXL0144	10.0	U	--	--	R	MSD	**0.130**	J--	MSD	--	--	--	--	--	--	--	--	--	**3.19**	--	--	**180**	--	--	**211**	--	--
DC-03	DC-03-150318	03/18/2015	N	5904651	2.00	U	--	**0.450**	J--	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.30**	J--	MSD	**180**	--	--	**160**	--	--
DC-03	YVD-D4-150318	03/18/2015	FD	5904651	1.00	U	--	**0.530**	J--	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.60**	J--	MSD	**180**	--	--	**160**	--	--
DC-03	DC-03-150617	06/17/2015	N	59011021	2.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.60**	J	RPD	**190**	J	RPD	**170**	--	--
DC-03	YVD-D4-150617	06/17/2015	FD	59011021	2.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.60**	J	RPD	**190**	J	RPD	**180**	--	--
DC-03	DC-03-150925	09/25/2015	N	59020431	4.00	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.30**	--	--	**180**	--	--	**150**	--	--
DC-03	YVD-D4-150925	09/25/2015	FD	59020431	4.00	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.20**	--	--	**180**	--	--	**160**	--	--
DC-03	DC-03-151216	12/16/2015	N	59025501	2.00	U	--	--	R	MSD	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**3.50**	--	--	**160**	--	--	**130**	--	--
DC-03	YVD-D4-151216	12/16/2015	FD	59025501	1.00	U	--	--	R	MSD	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**3.50**	--	--	**160**	--	--	**130**	--	--
DC-03	DC-03-160310	03/10/2016	N	59029941	2.00	U	--	**0.940**	J--	FDP, MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.10**	--	--	**180**	--	--	**170**	J	DUP
DC-03	YVD-D4-160310	03/10/2016	FD	59029941	2.00	U	--	0.250	UJ	FDP, MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.00**	--	--	**180**	--	--	**180**	J	DUP
DC-03	DC-03-160623	6/23/2016	N	59037371	2.00	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.50**	--	--	**190**	--	--	**160**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-03	YVD-D4-160623	6/23/2016	FD	59037371	1.00	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.30**	--	--	**180**	--	--	**160**	--	--
DC-03	DC-03-160927	9/27/2016	N	K1611565	0.100	U	--	--	R	MSD	--	--	--	**0.006**	J	--	--	--	--	--	--	--	**2.85**	--	--	**182**	--	--	**139**	--	--
DC-03	DC-03-D2-160927	9/27/2016	FD	K1611565	0.100	U	--	--	R	MSD	--	--	--	0.010	U	--	--	--	--	--	--	--	**2.87**	--	--	**183**	--	--	**138**	--	--
DC-03	DC-03-161212	12/12/2016	N	K1615029	0.100	U	--	0.500	U	--	--	--	--	**0.199**	--	--	--	--	--	--	--	--	**3.05**	--	--	**167**	--	--	**112**	--	--
DC-03	YVD-030817-13	3/8/2017	N	K1702324	**0.120**	--	--	0.500	U	--	--	--	--	**0.006**	J	--	--	--	--	--	--	--	**2.58**	--	--	**159**	--	--	**104**	--	--
DC-03	YVD-060517-02	6/5/2017	N	K1705702	0.100	U	--	0.500	U	--	--	--	--	**0.022**	--	--	--	--	--	--	--	--	**2.49**	--	--	**157**	--	--	**147**	--	--
DC-03	YVD-060517-04	6/5/2017	FD	K1705702	0.100	U	--	0.500	U	--	--	--	--	**0.019**	--	--	--	--	--	--	--	--	**2.49**	--	--	**158**	--	--	**122**	--	--
DC-03	YVD-092617-22	9/26/2017	N	K1710333	0.100	U	--	0.500	U	--	--	--	--	**0.010**	J	--	--	--	--	--	--	--	**2.92**	--	--	**159**	--	--	**115**	--	--
DC-03	YVD-120417-10	12/4/2017	N	K1713026	0.100	U	--	0.500	U	--	--	--	--	0.017	U	MBK	--	--	--	--	--	--	**2.76**	--	--	**161**	--	--	**108**	--	--
DC-03	YVD-031818-04	3/18/2018	N	870610	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.01**	--	--	**180**	--	--	**111**	--	--
DC-03	YVD-060418-22	6/4/2018	N	874860	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.34**	--	--	**174**	--	--	**108**	--	--
DC-03	YVD-090918-17	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.82**	--	--	**160**	--	--	**136**	--	--
DC-03	YVD-121018-03	12/10/2018	N	884857	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.24**	--	--	**170**	--	--	**134**	--	--
DC-03	YVD-031819-19	3/18/2019	N	988273	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.19**	--	--	**178**	--	--	**148**	--	--
DC-03	YVD-060419-32	6/4/2019	N	992242	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.02**	--	--	**172**	--	--	**152**	--	--
DC-03	YVD-091019-23	9/10/2019	N	998438	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.06**	--	--	**159**	--	--	**154**	--	--
DC-03	YVD-121019-22	12/10/2019	N	902321	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.60**	--	--	**164**	--	--	**156**	--	--
DC-03	YVD-033120-22	3/31/2020	N	006260	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.14**	--	--	**168**	--	--	**146**	--	--
DC-03	YVD-060920-26	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS										0.070	U	--	**3.30**	--	--	**174**	--	--	**161**	--	--
DC-03	YVD-092120-21	9/21/2020	N	013896	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.06**	--	--	**160**	--	--	**166**	--	--
DC-03	YVD-120720-05	12/7/2020	N	017035	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.58**	--	--	**170**	--	--	**160**	--	--
DC-03	YVD-120720-07	12/7/2020	FD	017035	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.66**	--	--	**166**	--	--	**161**	--	--
DC-03	YVD-030221-23	3/2/2021	N	120034	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.22**	--	--	**166**	--	--	**154**	--	--
DC-03	YVD-060821-27	6/8/2021	N	124212	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.07**	--	--	**160**	--	--	**162**	--	--
DC-03	YVD-031522-10	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03	YVD-031522-11	3/15/2022	FD	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03	YVD-060522-10	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03	YVD-091322-12	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03	YVD-122722-21	12/27/2022	N	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03	YVD-030623-15	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03	YVD-062023-20	6/20/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03	YVD-091023-06	9/10/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03D	DC-03D-130918	09/18/2013	N	SWI0138	2.00	U	--	**0.255**	--	--	--	--	--	--	--	--	0.100	U	--	--	--	--	**2.71**	--	--	**62.1**	--	--	**101**	--	--
DC-03D	DC-03D-131212	12/12/2013	N	SWL0073	2.00	U	--	0.200	UJ	MSD	--	--	--	--	--	--	--	--	--	0.060	U	--	**2.67**	--	--	**59.7**	--	--	**99.1**	--	--
DC-03D	DC-03D-140319	03/19/2014	N	SXC0107	2.00	U	--	**0.427**	J--	MSD	0.050	U	--	--	--	--	--	--	--	--	--	--	**2.67**	--	--	**57.5**	--	--	**106**	--	--
DC-03D	DC-03D-140603	06/03/2014	N	SXF0017	0.800	U	--	**0.468**	--	--	**0.074**	J+	FBK	--	--	--	--	--	--	--	--	--	**2.66**	--	--	**59.0**	--	--	**103**	J--	MSD
DC-03D	DC-03D-140923	09/23/2014	N	SXI0173	1.00	U	--	0.250	U	--	**0.098**	--	--	--	--	--	--	--	--	--	--	--	**3.40**	--	--	**67.8**	--	--	**89.4**	--	--
DC-03D	DC-03D-141217	12/17/2014	N	SXL0121	1.00	U	--	**0.282**	J--	MSD	0.100	U	--	--	--	--	--	--	--	--	--	--	**2.92**	--	--	**60.7**	--	--	**92.2**	--	--
DC-03D	DC-03D-150317	03/17/2015	N	5904651	1.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.00**	J--	MSD	**68.0**	--	--	**87.0**	--	--
DC-03D	DC-03D-150617	06/17/2015	N	59011021	1.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.20**	J	RPD	**68.0**	J	RPD	**93.0**	--	--
DC-03D	DC-03D-150925	09/25/2015	N	59020431	4.00	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.00**	--	--	**65.0**	--	--	**86.0**	--	--
DC-03D	DC-03D-151216	12/16/2015	N	59025501	1.00	U	--	--	R	MSD	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**3.20**	--	--	**69.0**	--	--	**94.0**	--	--
DC-03D	DC-03D-160310	03/10/2016	N	59029941	1.00	U	--	0.250	UJ	FDP, MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.00**	--	--	**68.0**	--	--	**90.0**	J	DUP
DC-03D	DC-03D-160623	6/23/2016	N	59037371	2.00	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.00**	--	--	**70.0**	--	--	**89.0**	--	--
DC-03D	DC-03D-160927	9/27/2016	N	K1611565	0.100	U	--	--	R	MSD	--	--	--	**0.006**	J	--	--	--	--	--	--	--	**2.73**	--	--	**63.0**	--	--	**90.9**	--	--
DC-03D	DC-03D-161212	12/12/2016	N	K1615029	0.100	U	--	0.500	U	--	--	--	--	**0.085**	--	--	--	--	--	--	--	--	**2.98**	--	--	**65.0**	--	--	**90.7**	--	--
DC-03D	YVD-030817-14	3/8/2017	N	K1702324	**0.050**	J	--	0.500	U	--	--	--	--	**0.008**	J	--	--	--	--	--	--	--	**2.75**	--	--	**61.3**	--	--	**80.8**	--	--
DC-03D	YVD-030817-16	3/8/2017	FD	K1702324	**0.040**	J	--	0.500	U	--	--	--	--	**0.008**	J	--	--	--	--	--	--	--	**2.69**	--	--	**60.2**	--	--	**79.6**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-03D	YVD-060517-09	6/5/2017	N	K1705702	0.100	U	--	0.500	U	--	--	--	--	**0.006**	J	--	--	--	--	--	--	--	**2.66**	--	--	**59.7**	--	--	**91.6**	--	--
DC-03D	YVD-092617-24	9/26/2017	N	K1710333	0.100	U	--	--	R	MSD	--	--	--	**0.011**	--	--	--	--	--	--	--	--	**3.16**	--	--	**67.1**	--	--	**101**	--	--
DC-03D	YVD-120417-08	12/4/2017	N	K1713026	0.100	U	--	0.500	U	--	--	--	--	0.011	U	MBK	--	--	--	--	--	--	**2.64**	--	--	**60.9**	--	--	**86.7**	--	--
DC-03D	YVD-031818-02	3/18/2018	N	870610	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.02**	--	--	**70.0**	--	--	**86.1**	--	--
DC-03D	YVD-060418-24	6/4/2018	N	874860	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.24**	--	--	**67.0**	--	--	**82.1**	--	--
DC-03D	YVD-090918-15	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.01**	--	--	**68.0**	--	--	**88.6**	--	--
DC-03D	YVD-121018-05	12/10/2018	N	884857	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.18**	--	--	**67.0**	--	--	**83.0**	--	--
DC-03D	YVD-031819-17	3/18/2019	N	988273	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.16**	--	--	**66.5**	--	--	**82.0**	--	--
DC-03D	YVD-060419-30	6/4/2019	N	992242	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.94**	--	--	**65.5**	--	--	**81.8**	--	--
DC-03D	YVD-060419-31	6/4/2019	FD	992242	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.96**	--	--	**66.0**	--	--	**82.6**	--	--
DC-03D	YVD-091019-21	9/10/2019	N	998438	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.99**	--	--	**65.0**	--	--	**81.7**	--	--
DC-03D	YVD-091019-22	9/10/2019	FD	998438	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.98**	--	--	**65.0**	--	--	**81.7**	--	--
DC-03D	YVD-121019-20	12/10/2019	N	902321	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.18**	--	--	**61.5**	--	--	**80.9**	--	--
DC-03D	YVD-033120-20	3/31/2020	N	006260	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.92**	--	--	**64.0**	--	--	**74.5**	--	--
DC-03D	YVD-061020-34	6/10/2020	N	009361	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.85**	--	--	**62.5**	--	--	**75.0**	--	--
DC-03D	YVD-092120-19	9/21/2020	N	013896	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.96**	--	--	**65.0**	--	--	**82.4**	--	--
DC-03D	YVD-120720-09	12/7/2020	N	017035	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.31**	--	--	**63.5**	--	--	**77.0**	--	--
DC-03D	YVD-030221-21	3/2/2021	N	120034	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.96**	--	--	**63.5**	--	--	**80.6**	--	--
DC-03D	YVD-030221-21	3/2/2021	N	120034	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.96**	--	--	**63.5**	--	--	**80.6**	--	--
DC-03D	YVD-060821-29	6/8/2021	N	124212	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.04**	--	--	**63.5**	--	--	**83.7**	--	--
DC-03D	YVD-060821-31	6/8/2021	FD	124212	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.98**	--	--	**62.5**	--	--	**81.0**	--	--
DC-03D	YVD-121421-10	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03D	YVD-031422-08	3/14/2022	N	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03D	YVD-060522-11	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03D	YVD-060522-11	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03D	YVD-091322-10	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03D	YVD-122722-20	12/27/2022	N	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03D	YVD-030623-14	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03D	YVD-062023-17	6/20/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03D	YVD-062023-18	6/20/2023	FD	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03D	YVD-091023-04	9/10/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-04	DC-04-130103	01/03/2013	N	EPA01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-04	DC-04-130920	09/20/2013	N	SWI0142	--	--	--	**3.03**	--	--	--	--	--	--	--	--	0.100	U	--	--	--	--	**3.45**	--	--	**32.1**	--	--	**93.6**	--	--
DC-04	DC-04-130924	09/24/2013	N	SWI0175	2.00	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-04	DC-04-131212	12/12/2013	N	SWL0073	2.00	U	--	0.200	UJ	MSD	--	--	--	--	--	--	--	--	--	**0.104**	--	--	**3.51**	--	--	**31.7**	--	--	**110**	--	--
DC-04	DC-04-140318	03/18/2014	N	SXC0107	2.00	U	--	**0.707**	J--	MSD	**0.130**	--	--	--	--	--	--	--	--	--	--	--	**3.58**	--	--	**30.4**	--	--	**107**	--	--
DC-04	DC-04-140603	06/03/2014	N	SXF0017	0.800	U	--	**0.645**	--	--	**0.240**	J+	FBK	--	--	--	--	--	--	--	--	--	**3.65**	--	--	**32.3**	--	--	**104**	J--	MSD
DC-04	DC-04-140923	09/23/2014	N	SXI0173	1.00	U	--	**0.524**	J+	MSD	**0.290**	--	--	--	--	--	--	--	--	--	--	--	**4.51**	--	--	**35.5**	--	--	**108**	--	--
DC-04	DC-04-141217	12/17/2014	N	SXL0121	1.00	U	--	0.250	UJ	MSD	**0.170**	--	--	--	--	--	--	--	--	--	--	--	**4.34**	--	--	**34.9**	--	--	**120**	--	--
DC-04	DC-04-150317	03/17/2015	N	5904651	1.00	U	--	**0.330**	J--	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.90**	J--	MSD	**36.0**	--	--	**110**	--	--
DC-04	DC-04-150617	06/17/2015	N	59010961	2.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.10**	J+	MSD	**36.0**	J+	MSD	**110**	--	--
DC-04	DC-04-150924	09/24/2015	N	59020391	1.00	U	--	**0.250**	J--	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.90**	--	--	**33.0**	--	--	**140**	J--	MSD
DC-04	YVD-D3-150924	09/24/2015	FD	59020391	1.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.10**	--	--	**35.0**	--	--	**150**	J--	MSD
DC-04	DC-04-151215	12/15/2015	N	59025431	1.00	U	--	--	R	MSD	0.250	UJ	FDP	--	--	--	--	--	--	--	--	--	**4.20**	--	--	**36.0**	--	--	**130**	--	--
DC-04	DC-04-160309	03/09/2016	N	59029711	1.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.00**	--	--	**36.0**	--	--	**150**	J+	MSD
DC-04	DC-04-160621	6/21/2016	N	59037271	1.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.40**	--	--	**39.0**	--	--	**150**	--	--
DC-04	DC-04-160926	9/26/2016	N	K1611506	0.100	U	--	--	R	MSD	--	--	--	**0.137**	--	--	--	--	--	--	--	--	**4.50**	--	--	**38.2**	--	--	**142**	--	--
DC-04	DC-04-161216	12/12/2016	N	K1615174	0.100	U	--	0.500	U	--	--	--	--	**0.052**	--	--	--	--	--	--	--	--	**4.11**	--	--	**36.9**	--	--	**155**	--	--
DC-04	YVD-031017-31	3/10/2017	N	K1702448	0.100	U	--	0.500	U	--	--	--	--	**0.035**	J	FDP	--	--	--	--	--	--	**3.75**	--	--	**32.4**	--	--	**153**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-04	YVD-031017-33	3/10/2017	FD	K1702448	0.100	U	--	0.500	U	--	--	--	--	**0.053**	J	FDP	--	--	--	--	--	--	**3.74**	--	--	**32.3**	--	--	**152**	--	--
DC-04	YVD-060617-26	6/6/2017	N	K1705833	0.100	U	--	0.500	U	--	--	--	--	**0.085**	--	--	--	--	--	--	--	--	**3.96**	--	--	**34.7**	--	--	**129**	--	--
DC-04	YVD-092517-06	9/25/2017	N	K1710274	0.100	U	--	0.500	U	--	--	--	--	**0.044**	--	--	--	--	--	--	--	--	**4.06**	--	--	**35.9**	--	--	**140**	--	--
DC-04	YVD-120517-24	12/5/2017	N	K1713091	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.037**	--	--	--	--	--	--	--	--	**3.62**	--	--	**32.7**	--	--	**121**	--	--
DC-04	YVD-031818-07	3/18/2018	N	870610	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.02**	--	--	**35.6**	--	--	**115**	--	--
DC-04	YVD-060418-18	6/4/2018	N	874662	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.18**	--	--	**34.4**	--	--	**119**	--	--
DC-04	YVD-090918-18	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.98**	--	--	**32.8**	--	--	**109**	--	--
DC-04	YVD-121118-18	12/11/2018	N	884939	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.08**	--	--	**32.0**	--	--	**102**	--	--
DC-04	YVD-032019-21	3/20/2019	N	988477	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.93**	--	--	**32.2**	--	--	**100**	--	--
DC-04	YVD-060219-14	6/2/2019	N	991939	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.00**	--	--	**32.2**	--	--	**103**	--	--
DC-04	YVD-090919-09	9/9/2019	N	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.98**	--	--	**31.6**	--	--	**102**	--	--
DC-04	YVD-120919-07	12/9/2019	N	902276	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.20**	--	--	**32.2**	J	MSD	**101**	--	--
DC-04	YVD-033120-18	3/31/2020	N	006260	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.04**	--	--	**32.8**	--	--	**101**	--	--
DC-04	YVD-060820-08	6/8/2020	N	009144	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	**0.070**	--	--	**4.14**	--	--	**33.8**	--	--	**102**	--	--
DC-04	YVD-092020-07	9/20/2020	N	013864	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.22**	--	--	**34.6**	--	--	**108**	--	--
DC-04	YVD-120820-23	12/8/2020	N	017137	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.32**	--	--	**35.2**	--	--	**121**	--	--
DC-04	YVD-030221-20	3/2/2021	N	120034	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.40**	--	--	**34.7**	--	--	**112**	--	--
DC-04	YVD-030221-22	3/2/2021	FD	120034	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.22**	--	--	**34.3**	--	--	**111**	--	--
DC-04	YVD-030221-20	3/2/2021	N	120034	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.40**	--	--	**34.7**	--	--	**112**	--	--
DC-04	YVD-030221-22	3/2/2021	FD	120034	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.22**	--	--	**34.3**	--	--	**111**	--	--
DC-04	YVD-060621-06	6/6/2021	N	124053	0.050	U	--	5.00	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.22**	--	--	**33.2**	--	--	**109**	--	--
DC-04	YVD-121521-21	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-04	YVD-031522-15	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-04	YVD-060522-05	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-04	YVD-091322-06	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-04	YVD-120722-09	12/7/2022	N	K2214479	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-04	YVD-120722-10	12/7/2022	FD	K2214479	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-04	YVD-030623-17	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-04	YVD-030623-18	3/6/2023	FD	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-04	YVD-062023-11	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-04	YVD-091123-22	9/11/2023	N	K2310209	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05	DC-05-130104	01/04/2013	N	EPA01	--		--	--		--	--	--	--	--	--	--	--	--	--	--	--	--	--		--	--		--	--		--
DC-05	DC-05-130920	09/20/2013	N	SWI0142	--		--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	**2.88**		--	**64.2**		--	**154**		--
DC-05	DC-05-130924	09/24/2013	N	SWI0175	2.00	U	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--	--		--	--		--	--		--
DC-05	DC-05-131212	12/12/2013	N	SWL0073	2.00	U	--	0.200	UJ	MSD	--	--	--	--	--	--	--	--	--	**0.723**	--	--	**3.92**	--	--	**64.2**	--	--	**178**	--	--
DC-05	DC-05-140318	03/18/2014	N	SXC0107	2.00	U	--	**0.558**	J--	MSD	**0.060**	--	--	--	--	--	--	--	--	--	--	--	**2.90**	--	--	**59.4**	--	--	**150**	--	--
DC-05	DC-05-140603	06/03/2014	N	SXF0017	0.800	U	--	**0.581**	--	--	**0.280**	J+	FBK	--	--	--	--	--	--	--	--	--	**3.25**	--	--	**61.3**	--	--	**128**	J--	MSD
DC-05	DC-05-140923	09/23/2014	N	SXI0173	1.00	U	--	**1.00**	J+	MSD	**0.160**	--	--	--	--	--	--	--	--	--	--	--	**3.86**	--	--	**71.0**	--	--	**122**	--	--
DC-05	DC-05-141217	12/17/2014	N	SXL0121	1.00	U	--	0.250	UJ	MSD	**0.130**	--	--	--	--	--	--	--	--	--	--	--	**3.41**	--	--	**59.0**	--	--	**141**	--	--
DC-05	DC-05-150317	03/17/2015	N	5904541	0.800	U	--	**0.270**	J--	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.00**	--	--	**61.0**	--	--	**140**	J--	MSD
DC-05	DC-05-150616	06/16/2015	N	59010961	0.800	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.00**	J+	MSD	**64.0**	J+	MSD	**120**	--	--
DC-05	YVD-D2-150616	06/16/2015	FD	59010961	2.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.30**	J+	MSD	**64.0**	J+	MSD	**110**	--	--
DC-05	DC-05-150923	09/23/2015	N	59020391	0.800	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.10**	--	--	**56.0**	--	--	**110**	J--	MSD
DC-05	DC-05-151215	12/15/2015	N	59025431	0.800	U	--	--	R	MSD	0.250	UJ	FDP	--	--	--	--	--	--	--	--	--	**2.90**	--	--	**51.0**	--	--	**120**	--	--
DC-05	DC-05-160309	03/09/2016	N	59029711	0.800	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.90**	--	--	**53.0**	--	--	**140**	J+	MSD
DC-05	DC-05-160621	6/21/2016	N	59037151	0.800	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.80**	--	--	**53.0**	--	--	**130**	--	--
DC-05	DC-05-160926	9/26/2016	N	K1611506	0.100	U	--	--	R	MSD	--	--	--	**0.031**	--	--	--	--	--	--	--	--	**2.89**	--	--	**54.9**	--	--	**114**	--	--
DC-05	DC-05-D1-160926	9/26/2016	FD	K1611506	0.100	U	--	--	R	MSD	--	--	--	**0.028**	--	--	--	--	--	--	--	--	**3.06**	--	--	**58.1**	--	--	**114**	--	--
DC-05	DC-05-161216	12/16/2016	N	K1615174	0.100	U	--	0.500	U	--	--	--	--	**0.048**	--	--	--	--	--	--	--	--	**2.60**	--	--	**47.9**	--	--	**108**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-05	YVD-D5-161216	12/16/2016	FD	K1615174	0.100	U	--	0.500	U	--	--	--	--	**0.04**	--	--	--	--	--	--	--	--	**2.65**	--	--	**49.6**	--	--	**107**	--	--
DC-05	YVD-030717-09	3/7/2017	N	K1702324	0.100	U	--	0.500	U	--	--	--	--	**0.026**	--	--	--	--	--	--	--	--	**2.61**	--	--	**58.3**	--	--	**97.6**	--	--
DC-05	YVD-060717-30	6/7/2017	N	K1705833	0.100	U	--	0.500	U	--	--	--	--	**0.059**	J	FDP	--	--	--	--	--	--	**2.82**	--	--	**63.9**	--	--	**102**	--	--
DC-05	YVD-060717-32	6/7/2017	FD	K1705833	0.100	U	--	0.500	U	--	--	--	--	**0.031**	J	FDP	--	--	--	--	--	--	**2.77**	--	--	**62.6**	--	--	**102**	--	--
DC-05	YVD-092517-04	9/25/2017	N	K1710274	0.100	U	--	0.500	U	--	--	--	--	**0.039**	--	--	--	--	--	--	--	--	**2.99**	--	--	**62.0**	--	--	**107**	--	--
DC-05	YVD-120517-16	12/5/2017	N	K1713091	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.014**	--	--	--	--	--	--	--	--	**2.52**	--	--	**59.1**	--	--	**88.8**	--	--
DC-05	YVD-120517-18	12/5/2017	FD	K1713091	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.014**	--	--	--	--	--	--	--	--	**2.53**	--	--	**60.0**	--	--	**89.3**	--	--
DC-05	YVD-031818-03	3/18/2018	N	870610	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.94**	--	--	**75.0**	--	--	**97.4**	--	--
DC-05	YVD-031818-05	3/18/2018	FD	870610	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.94**	--	--	**75.0**	--	--	**96.7**	--	--
DC-05	YVD-060318-02	6/3/2018	FD	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.02**	--	--	**72.0**	--	--	**88.3**	--	--
DC-05	YVD-090918-03	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.91**	--	--	**65.5**	--	--	**95.4**	--	--
DC-05	YVD-121118-16	12/11/2018	N	884939	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.05**	--	--	**68.1**	--	--	**92.2**	--	--
DC-05	YVD-031719-02	3/17/2019	N	988239	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.10**	--	--	**68.5**	--	--	**117**	--	--
DC-05	YVD-060219-08	6/2/2019	N	991939	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.14**	--	--	**71.0**	--	--	**122**	--	--
DC-05	YVD-090919-14	9/9/2019	N	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.02**	--	--	**65.5**	--	--	**129**	--	--
DC-05	YVD-120919-03	12/9/2019	N	902276	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.12**	--	--	**72.5**	J	MSD	**110**	--	--
DC-05	YVD-033020-12	3/30/2020	N	006241	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.20**	--	--	**76.0**	--	--	**142**	--	--
DC-05	YVD-060820-06	6/8/2020	N	009144	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.26**	--	--	**76.0**	--	--	**114**	--	--
DC-05	YVD-092020-03	9/20/2020	N	013864	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.18**	--	--	**72.0**	--	--	**149**	--	--
DC-05	YVD-120720-06	12/7/2020	N	017035	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.42**	--	--	**65.0**	--	--	**166**	--	--
DC-05	YVD-030221-16	3/2/2021	N	120034	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.24**	--	--	**60.0**	--	--	**143**	--	--
DC-05	YVD-060721-14	6/7/2021	N	124105	0.050	U	--	5.00	UJ	MS, RPD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.26**	--	--	**52.0**	--	--	**102**	--	--
DC-05	YVD-121521-15	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05	YVD-031422-04	3/14/2022	N	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05	YVD-060522-02	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05	YVD-060522-03	6/5/2022	FD	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05	YVD-091322-02	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05	YVD-091322-04	9/13/2022	FD	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05	YVD-120622-02	12/6/2022	N	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05	YVD-120622-03	12/6/2022	FD	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05	YVD-030623-20	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05	YVD-062023-08	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05	YVD-091123-16	9/11/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05D	DC-05D-130920	09/20/2013	N	SWI0142	--	--	--	**0.361**	--	--	--	--	--	--	--	--	**0.163**	--	--	--	--	--	**3.67**	--	--	**40.5**	--	--	**167**	--	--
DC-05D	DC-05D-130924	09/24/2013	N	SWI0178	0.200	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05D	DC-05D-131211	12/11/2013	N	SWL0073	2.00	U	--	0.200	UJ	MSD	--	--	--	--	--	--	--	--	--	0.060	U	--	**3.52**	--	--	**37.5**	--	--	**145**	--	--
DC-05D	DC-05D-140318	03/18/2014	N	SXC0095	2.00	U	--	0.250	U	--	**0.072**	--	--	--	--	--	--	--	--	--	--	--	**3.73**	--	--	**36.7**	--	--	**137**	J--	MSD
DC-05D	DC-05D-140602	06/02/2014	N	SXF0017	0.800	U	--	**0.591**	--	--	**0.560**	J+	FBK	--	--	--	--	--	--	--	--	--	**4.99**	--	--	**34.3**	--	--	**122**	J--	MSD
DC-05D	DC-05D-140922	09/22/2014	N	SXI0148	0.800	U	--	**0.424**	--	--	**0.057**	--	--	--	--	--	--	--	--	--	--	--	**3.56**	--	--	**37.8**	--	--	**127**	--	--
DC-05D	DC-05D-141216	12/16/2014	N	SXL0121	0.200	U	--	0.250	UJ	MSD	**0.390**	--	--	--	--	--	--	--	--	--	--	--	**5.18**	--	--	**36.8**	--	--	**140**	--	--
DC-05D	DC-05D-150317	03/17/2015	N	5904541	0.800	U	--	0.250	UJ	MSD	**0.300**	--	--	--	--	--	--	--	--	--	--	--	**4.60**	--	--	**39.0**	--	--	**120**	J--	MSD
DC-05D	DC-05D-150616	06/16/2015	N	59010961	0.800	U	--	0.250	UJ	MSD	**0.270**	--	--	--	--	--	--	--	--	--	--	--	**4.70**	J+	MSD	**41.0**	J+	MSD	**120**	--	--
DC-05D	DC-05D-150923	09/23/2015	N	59020391	0.800	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.40**	--	--	**38.0**	--	--	**120**	J--	MSD
DC-05D	YVD-D2-150923	09/23/2015	FD	59020391	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.40**	--	--	**38.0**	--	--	**120**	J--	MSD
DC-05D	DC-05D-151215	12/15/2015	N	59025431	0.800	U	--	--	R	MSD	0.250	UJ	FDP	--	--	--	--	--	--	--	--	--	**4.40**	--	--	**39.0**	--	--	**120**	--	--
DC-05D	DC-05D-160309	03/09/2016	N	59029711	0.800	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.30**	--	--	**41.0**	--	--	**140**	J+	MSD
DC-05D	DC-05D-160621	6/21/2016	N	59037271	0.800	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.10**	--	--	**41.0**	--	--	**130**	--	--
DC-05D	DC-05D-160926	9/26/2016	N	K1611506	0.100	U	--	--	R	MSD	--	--	--	**0.014**	--	--	--	--	--	--	--	--	**3.93**	--	--	**39.4**	J	MSD	**113**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-05D	DC-05D-161214	12/14/2016	N	K1615126	0.100	U	--	0.500	U	--	--	--	--	**0.015**	--	--	--	--	--	--	--	--	**3.90**	--	--	**38.2**	--	--	**114**	--	--
DC-05D	YVD-030717-12	3/7/2017	N	K1702324	0.100	U	--	0.500	U	--	--	--	--	**0.041**	--	--	--	--	--	--	--	--	**3.64**	--	--	**35.6**	--	--	**105**	--	--
DC-05D	YVD-060717-34	6/7/2017	N	K1705833	0.100	U	--	0.500	U	--	--	--	--	**0.012**	--	--	--	--	--	--	--	--	**3.78**	--	--	**37.4**	--	--	**101**	--	--
DC-05D	YVD-092517-02	9/25/2017	N	K1710274	0.100	U	--	0.500	U	--	--	--	--	**0.024**	J	FDP	--	--	--	--	--	--	**3.91**	--	--	**38.7**	--	--	**118**	--	--
DC-05D	YVD-092517-03	9/25/2017	FD	K1710274	0.100	U	--	0.500	U	--	--	--	--	**0.008**	J	FDP	--	--	--	--	--	--	**4.02**	--	--	**38.9**	--	--	**115**	--	--
DC-05D	YVD-120517-20	12/5/2017	N	K1713091	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.013**	--	--	--	--	--	--	--	--	**3.69**	--	--	**37.6**	--	--	**112**	--	--
DC-05D	YVD-031818-08	3/18/2018	N	870610	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.97**	--	--	**41.2**	--	--	**108**	--	--
DC-05D	YVD-060318-03	6/3/2018	N	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.12**	--	--	**39.6**	--	--	**105**	--	--
DC-05D	YVD-060318-05	6/3/2018	FD	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.14**	--	--	**39.6**	--	--	**105**	--	--
DC-05D	YVD-090918-02	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.00**	--	--	**38.0**	--	--	**107**	--	--
DC-05D	YVD-121118-14	12/11/2018	N	884939	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.15**	--	--	**38.0**	--	--	**102**	--	--
DC-05D	YVD-031719-04	3/17/2019	N	988239	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.06**	--	--	**38.2**	--	--	**110**	--	--
DC-05D	YVD-031719-06	3/17/2019	FD	988239	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.11**	--	--	**38.6**	--	--	**109**	--	--
DC-05D	YVD-060219-10	6/2/2019	N	991939	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.00**	--	--	**37.8**	--	--	**109**	--	--
DC-05D	YVD-090919-12	9/9/2019	N	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.96**	--	--	**35.4**	--	--	**105**	--	--
DC-05D	YVD-120919-05	12/9/2019	N	902276	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.97**	--	--	**36.6**	J	MSD	**105**	--	--
DC-05D	YVD-033020-14	3/30/2020	N	006241	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.01**	--	--	**37.6**	--	--	**107**	--	--
DC-05D	YVD-060820-02	6/8/2020	N	009144	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.03**	--	--	**38.6**	--	--	**118**	--	--
DC-05D	YVD-060820-04	6/8/2020	FD	009144	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.06**	--	--	**38.7**	--	--	**102**	--	--
DC-05D	YVD-092020-04	9/20/2020	N	013864/20I0421	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.02**	--	--	**38.0**	--	--	**107**	--	--
DC-05D	YVD-092020-05	9/20/2020	FD	013864/20I0421	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.03**	--	--	**37.8**	--	--	**106**	--	--
DC-05D	YVD-120720-02	12/7/2020	N	017035	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.30**	--	--	**38.4**	--	--	**108**	--	--
DC-05D	YVD-120720-04	12/7/2020	FD	017035	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.26**	--	--	**38.2**	--	--	**108**	--	--
DC-05D	YVD-030221-18	3/2/2021	N	120034	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.07**	--	--	**37.8**	--	--	**107**	--	--
DC-05D	YVD-060721-13	6/7/2021	N	124105	0.050	U	--	5.00	UJ	MS, RPD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.11**	--	--	**36.9**	--	--	**106**	--	--
DC-05D	YVD-121421-04	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05D	YVD-031422-02	3/14/2022	N	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05D	YVD-031422-03	3/14/2022	FD	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05D	YVD-060522-04	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05D	YVD-091322-03	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05D	YVD-120622-04	12/6/2022	N	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05D	YVD-030623-22	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05D	YVD-062023-10	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05D	YVD-091123-18	9/11/2023	N	K2310209	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-07	DC-07-130103	01/03/2013	N	EPA01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-07	DC-07-130918	09/18/2013	N	SWI0123	2.00	U	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	1.00	U	--	**45.7**	--	--	**168**	--	--
DC-07	YVD-D1-130918	09/18/2013	FD	SWI0123	2.00	U	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	1.00	U	--	**46.1**	--	--	**179**	--	--
DC-07	DC-07-131210	12/10/2013	N	SWL0055	2.00	U	--	0.437	UJ	ERL, MSD	--	--	--	--	--	--	--	--	--	**0.065**	--	--	**3.82**	--	--	**38.4**	--	--	**117**	--	--
DC-07	DC-07-140316	03/16/2014	N	SXC0081	0.800	U	--	0.250	U	--	**0.110**	--	--	--	--	--	--	--	--	--	--	--	**1.04**	--	--	**33.5**	--	--	**78.9**	--	--
DC-07	DC-07-140602	06/02/2014	N	SXF0008	0.800	U	--	**0.340**	--	--	**0.120**	--	--	--	--	--	--	--	--	--	--	--	1.00	U	--	**36.3**	--	--	**105**	--	--
DC-07	DC-07-140922	09/22/2014	N	SXI0148	0.800	U	--	**0.487**	--	--	**0.190**	--	--	--	--	--	--	--	--	--	--	--	1.00	U	--	**33.7**	--	--	**98.2**	--	--
DC-07	DC-07-141216	12/16/2014	N	SXL0108	0.800	U	--	**0.261**	--	--	0.100	U	--	--	--	--	--	--	--	--	--	--	1.00	U	--	**30.6**	--	--	**80.4**	--	--
DC-07	YVD-D2-141216	12/16/2014	FD	SXL0108	0.200	U	--	**0.305**	--	--	0.100	U	--	--	--	--	--	--	--	--	--	--	1.00	U	--	**30.8**	--	--	**82.1**	--	--
DC-07	DC-07-150317	03/17/2015	N	5904541	0.800	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**1.00**	--	--	**35.0**	--	--	**83.0**	J--	MSD
DC-07	DC-07-150617	06/17/2015	N	59011021	0.800	U	--	**0.280**	J--	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	1.00	U	--	**37.0**	J	RPD	**93.0**	--	--
DC-07	DC-07-150924	09/24/2015	N	59020391	0.800	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	1.00	U	--	**33.0**	--	--	**95.0**	J--	MSD
DC-07	DC-07-151215	12/15/2015	N	59025501	0.800	U	--	--	R	MSD	**0.410**	J--	MSD	--	--	--	--	--	--	--	--	--	1.00	U	--	**34.0**	--	--	**70.0**	--	--

Table 8
Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-07	DC-07-160309	03/09/2016	N	59029941	0.800	U	--	--	R	FBK, FDP, MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**1.10**	--	--	**36.0**	--	--	**78.0**	J	DUP
DC-07	DC-07-160621	6/21/2016	N	59037271	0.800	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**1.20**	--	--	**38.0**	--	--	**96.0**	--	--
DC-07	DC-07-160926	9/26/2016	N	K1611565	0.100	U	--	--	R	MSD	--	--	--	**0.057**	--	--	--	--	--	--	--	--	**1.06**	--	--	**36.6**	--	--	**92.3**	--	--
DC-07	DC-07-161214	12/14/2016	N	K1615083	0.100	U	--	0.500	U	--	--	--	--	**0.078**	--	--	--	--	--	--	--	--	**1.05**	--	--	**32.0**	--	--	**72.4**	--	--
DC-07	YVD-030917-25	3/9/2017	N	K1702448	0.100	U	--	0.500	U	--	--	--	--	**0.093**	--	--	--	--	--	--	--	--	**1.03**	--	--	**32.1**	--	--	**59.8**	--	--
DC-07	YVD-060617-18	6/6/2017	N	K1705754	0.100	U	--	0.500	U	--	--	--	--	**0.061**	--	--	--	--	--	--	--	--	**1.10**	--	--	**34.6**	--	--	**70.4**	--	--
DC-07	YVD-092517-12	9/25/2017	N	K1710333	0.100	U	--	0.500	U	--	--	--	--	**0.058**	--	--	--	--	--	--	--	--	**1.14**	--	--	**34.5**	--	--	**94.2**	--	--
DC-07	YVD-120417-14	12/4/2017	N	K1713026	0.100	U	--	0.500	U	--	--	--	--	**0.064**	--	--	--	--	--	--	--	--	**1.17**	--	--	**33.0**	--	--	**81.9**	--	--
DC-07	YVD-060318-17	6/3/2018	N	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**1.52**	--	--	**37.8**	--	--	**93.4**	--	--
DC-07	YVD-060319-20	6/3/2019	N	992053	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**0.820**	--	--	**44.0**	--	--	**49.5**	--	--
DC-07	YVD-060920-18	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**0.980**	--	--	**59.5**	--	--	**110**	--	--
DC-07	YVD-092120-22	9/21/2020	N	013896	0.050	U	--	2.50	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**1.02**	--	--	**62.0**	--	--	**77.1**	--	--
DC-07	YVD-120820-22	12/8/2020	N	017137	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**1.06**	--	--	**54.5**	--	--	**59.8**	--	--
DC-07	YVD-030121-10	3/1/2021	N	119931	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**1.02**	--	--	**50.5**	--	--	**73.2**	--	--
DC-07	YVD-060721-16	6/7/2021	N	124105	0.050	U	--	5.00	UJ	MS, RPD	--	--	--	--	--	--	--	--	--	0.070	U	--	**0.960**	--	--	**48.4**	--	--	**23.1**	J	FDP
DC-07	YVD-060721-17	6/7/2021	FD	124105	0.050	U	--	5.00	UJ	MS, RPD	--	--	--	--	--	--	--	--	--	0.070	U	--	**0.970**	--	--	**48.1**	--	--	**37.8**	J	FDP
DC-07	YVD-121521-17	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-07	YVD-031522-13	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-07	YVD-060522-08	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-07	YVD-091422-16	9/14/2022	N	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-07	YVD-091422-17	9/14/2022	FD	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-07	YVD-122722-23	12/27/2022	N	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-07	YVD-030623-12	3/6/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-07	YVD-062123-27	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-07	YVD-091123-14	9/11/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-09	DC-09-130103	01/03/2013	N	EPA01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-09	DC-09-130923	09/23/2013	N	SWI0178	--	--	--	**0.447**	--	--	--	--	--	--	--	--	0.100	U	--	--	--	--	**2.75**	--	--	**39.7**	--	--	--	--	--
DC-09	DC-09-130926	09/26/2013	N	SWI0190	0.200	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**30.7**	--	--
DC-09	DC-09-131211	12/11/2013	N	SWL0063	0.200	U	--	0.200	U	--	--	--	--	--	--	--	--	--	--	**0.125**	--	--	**2.48**	--	--	**39.1**	--	--	**34.4**	J--	MSD
DC-09	DC-09-140317	03/17/2014	N	SXC0095	0.200	U	--	**0.251**	--	--	**0.180**	--	--	--	--	--	--	--	--	--	--	--	**2.88**	--	--	**36.5**	--	--	**28.8**	J--	MSD
DC-09	DC-09-140602	06/02/2014	N	SXF0008	0.200	U	--	**0.279**	--	--	**0.220**	J	FDP	--	--	--	--	--	--	--	--	--	**2.92**	--	--	**38.1**	--	--	**29.4**	--	--
DC-09	YVD-D3-140602	06/02/2014	FD	SXF0008	0.200	U	--	**0.359**	--	--	**0.160**	J	FDP	--	--	--	--	--	--	--	--	--	**3.08**	--	--	**37.9**	--	--	**29.1**	--	--
DC-09	DC-09-140923	09/23/2014	N	SXI0158	0.200	U	--	0.250	U	--	0.050	U	--	--	--	--	--	--	--	--	--	--	**1.94**	--	--	**38.9**	J+	MSD	**29.6**	--	--
DC-09	DC-09-141216	12/16/2014	N	SXL0108	0.200	U	--	0.250	U	--	**0.130**	--	--	--	--	--	--	--	--	--	--	--	**2.48**	--	--	**39.1**	--	--	**30.2**	--	--
DC-09	DC-09-150316	03/16/2015	N	5904541	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.60**	--	--	**43.0**	--	--	**29.0**	J--	MSD
DC-09	DC-09-150616	06/16/2015	N	59010751	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.30**	J+	MSD	**38.0**	J+	MSD	**28.0**	J--	MSD
DC-09	DC-09-150923	09/23/2015	N	59020281	0.200	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.50**	--	--	**40.0**	--	--	**30.0**	--	--
DC-09	DC-09-151214	12/14/2015	N	59025431	0.200	U	--	--	R	MSD	**0.300**	J	FDP	--	--	--	--	--	--	--	--	--	**2.70**	--	--	**40.0**	--	--	**31.0**	--	--
DC-09	DC-09-160308	03/08/2016	N	59029711	0.200	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.30**	--	--	**39.0**	--	--	**31.0**	J+	MSD
DC-09	YVD-D2-160308	03/08/2016	FD	59029711	0.200	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.10**	--	--	**39.0**	--	--	**31.0**	J+	MSD
DC-09	DC-09-160621	6/21/2016	N	59037151	0.200	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.20**	--	--	**41.0**	--	--	**32.0**	--	--
DC-09	DC-09-160929	9/29/2016	N	K1611704	0.100	U	--	0.500	U	--	--	--	--	**0.016**	--	--	--	--	--	--	--	--	**2.00**	--	--	**39.3**	--	--	**29.8**	--	--
DC-09	DC-09-D4-160929	9/29/2016	FD	K1611704	0.100	U	--	0.500	U	--	--	--	--	**0.013**	--	--	--	--	--	--	--	--	**1.98**	--	--	**38.8**	--	--	**29.6**	--	--
DC-09	DC-09-161215	12/15/2016	N	K1615126	0.100	U	--	0.500	U	--	--	--	--	**0.009**	J	--	--	--	--	--	--	--	**1.99**	--	--	**38.9**	--	--	**30.6**	--	--
DC-09	YVD-D4-161215	12/15/2016	FD	K1615126	0.100	U	--	0.500	U	--	--	--	--	**0.007**	J	--	--	--	--	--	--	--	**1.98**	--	--	**37.8**	--	--	**30.6**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-09	YVD-031317-36	3/13/2017	N	K1702489	0.100	U	--	0.500	U	--	--	--	--	**0.024**	--	--	--	--	--	--	--	--	**2.00**	--	--	**38.8**	--	--	**28.2**	--	--
DC-09	YVD-060717-27	6/7/2017	N	K1705833	0.100	U	--	0.500	U	--	--	--	--	**0.029**	--	--	--	--	--	--	--	--	**1.97**	--	--	**39.3**	--	--	**30.3**	--	--
DC-09	YVD-092617-23	9/26/2017	N	K1710333	0.100	U	--	0.500	U	--	--	--	--	0.010	U	--	--	--	--	--	--	--	**1.98**	--	--	**38.5**	--	--	**32.5**	--	--
DC-09	YVD-120417-09	12/4/2017	N	K1713026	0.100	U	--	0.500	U	--	--	--	--	0.014	U	MBK	--	--	--	--	--	--	**1.86**	--	--	**37.3**	--	--	**30.6**	--	--
DC-09	YVD-060418-25	6/4/2018	N	874860	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.08**	--	--	**40.2**	--	--	**29.2**	--	--
DC-09	YVD-060319-19	6/3/2019	N	992053	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.06**	--	--	**39.2**	--	--	**27.6**	--	--
DC-09	YVD-060920-25	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.04**	--	--	**40.8**	--	--	**30.8**	--	--
DC-09	YVD-060721-15	6/7/2021	N	124105	0.050	U	--	5.00	UJ	MS, RPD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.13**	--	--	**37.4**	--	--	**14.8**	--	--
DC-09	YVD-060722-29	6/7/2022	N	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-09	YVD-062123-22	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-09	YVD-062123-23	6/21/2023	FD	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-14	DC-14-130103	01/03/2013	N	EPA01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-14	DC-14-130917	09/17/2013	N	SWI0113	0.200	U	--	**0.310**	--	--	--	--	--	--	--	--	**0.199**	--	--	--	--	--	**5.85**	--	--	**94.9**	--	--	**34.2**	--	--
DC-14	DC-14-131211	12/11/2013	N	SWL0063	2.00	U	--	0.200	U	--	--	--	--	--	--	--	--	--	--	**0.167**	--	--	**4.71**	--	--	**94.0**	--	--	**33.9**	J--	MSD
DC-14	DC-14-140318	03/18/2014	N	SXC0095	2.00	U	--	0.250	U	--	**0.260**	--	--	--	--	--	--	--	--	--	--	--	**5.25**	--	--	**87.0**	--	--	**35.7**	J--	MSD
DC-14	DC-14-140602	06/02/2014	N	SXF0017	0.400	U	--	**0.367**	--	--	**0.420**	J+	FBK	--	--	--	--	--	--	--	--	--	**5.37**	--	--	**83.2**	--	--	**24.2**	J--	MSD
DC-14	DC-14-140923	09/23/2014	N	SXI0158	0.400	U	--	**0.315**	--	--	**0.300**	--	--	--	--	--	--	--	--	--	--	--	**4.95**	--	--	**88.6**	J+	MSD	**25.9**	--	--
DC-14	DC-14-141216	12/16/2014	N	SXL0108	0.400	U	--	0.250	U	--	**0.140**	--	--	--	--	--	--	--	--	--	--	--	**5.57**	--	--	**84.5**	--	--	**29.8**	--	--
DC-14	DC-14-150316	03/16/2015	N	5904541	0.400	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**6.10**	--	--	**100**	--	--	**38.0**	J--	MSD
DC-14	DC-14-150616	06/16/2015	N	59010961	0.400	U	--	0.250	UJ	MSD	**0.300**	--	--	--	--	--	--	--	--	--	--	--	**6.50**	J+	MSD	**85.0**	J+	MSD	**29.0**	--	--
DC-14	DC-14-150924	09/24/2015	N	59020391	0.400	U	--	0.250	UJ	MSD	**0.310**	--	--	--	--	--	--	--	--	--	--	--	**6.30**	--	--	**92.0**	--	--	**42.0**	J--	MSD
DC-14	DC-14-151214	12/14/2015	N	59025351	0.400	U	--	0.250	UJ	MSD	**0.350**	--	--	--	--	--	--	--	--	--	--	--	**6.60**	--	--	**100**	--	--	**39.0**	--	--
DC-14	YVD-D1-151214	12/14/2015	FD	59025351	0.200	U	--	0.250	UJ	MSD	**0.380**	--	--	--	--	--	--	--	--	--	--	--	**6.60**	--	--	**100**	--	--	**41.0**	--	--
DC-14	DC-14-160309	03/09/2016	N	59029711	0.400	U	--	--	R	MSD	**0.330**	--	--	--	--	--	--	--	--	--	--	--	**6.60**	--	--	**95.0**	--	--	**39.0**	J+	MSD
DC-14	DC-14-160620	6/20/2016	N	59037151	0.400	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**6.00**	--	--	**92.0**	--	--	**38.0**	--	--
DC-14	DC-14-160929	9/29/2016	N	K1611704	0.100	U	--	0.500	U	--	--	--	--	**0.009**	J	--	--	--	--	--	--	--	**4.75**	--	--	**74.9**	--	--	**23.1**	--	--
DC-14	DC-14-161216	12/16/2016	N	K1615174	0.100	U	--	0.500	U	--	--	--	--	**0.014**	--	--	--	--	--	--	--	--	**4.37**	--	--	**68.8**	--	--	**21.9**	--	--
DC-14	YVD-031317-38	3/14/2017	N	K1702542	0.100	U	--	0.500	U	--	--	--	--	**0.074**	--	--	--	--	--	--	--	--	**4.57**	--	--	**68.4**	--	--	**20.8**	--	--
DC-14	YVD-060617-19	6/6/2017	N	K1705754	0.100	U	--	0.500	U	--	--	--	--	**0.010**	J	--	--	--	--	--	--	--	**4.40**	--	--	**65.2**	--	--	**26.9**	--	--
DC-14	YVD-092517-11	9/25/2017	N	K1710274	0.100	U	--	0.500	U	--	--	--	--	**0.005**	J	--	--	--	--	--	--	--	**4.63**	--	--	**64.3**	--	--	**23.9**	--	--
DC-14	YVD-120617-27	12/6/2017	N	K1713157	0.100	U	--	0.500	U	--	--	--	--	**0.020**	--	--	--	--	--	--	--	--	**4.49**	--	--	**60.5**	--	--	**20.3**	--	--
DC-14	YVD-120617-29	12/6/2017	FD	K1713157	0.100	U	--	0.500	U	--	--	--	--	**0.021**	--	--	--	--	--	--	--	--	**4.44**	--	--	**60.6**	--	--	**20.0**	--	--
DC-14	YVD-031918-20	3/19/2018	N	870634	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.56**	--	--	**58.0**	--	--	**17.8**	--	--
DC-14	YVD-060518-28	6/5/2018	N	874860	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.62**	--	--	**56.0**	--	--	**16.1**	--	--
DC-14	YVD-060518-30	6/5/2018	FD	874860	--	R	PRS	0.500	UJ	MBK	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.78**	--	--	**57.5**	--	--	--	R	PRS
DC-14	YVD-090918-08	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.80**	--	--	**54.0**	--	--	**16.0**	--	--
DC-14	YVD-090918-10	9/9/2018	FD	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.78**	--	--	**53.5**	--	--	**15.3**	--	--
DC-14	YVD-121018-07	12/10/2018	N	884857	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.92**	--	--	**55.5**	--	--	**14.9**	--	--
DC-14	YVD-031719-09	3/17/2019	N	988239	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.05**	--	--	**53.5**	--	--	**15.1**	--	--
DC-14	YVD-060319-17	6/3/2019	N	992053	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.15**	--	--	**53.5**	--	--	**13.6**	--	--
DC-14	YVD-091019-18	9/10/2019	N	998438	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.20**	--	--	**53.5**	--	--	**17.1**	--	--
DC-14	YVD-120919-14	12/9/2019	N	902276	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.40**			**54.5**	J	MSD	**20.3**	--	--
DC-14	YVD-033120-19	3/31/2020	N	006260	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.25**	--	--	**53.5**	--	--	**21.1**	--	--
DC-14	YVD-033120-21	3/31/2020	FD	006260	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.35**	--	--	**54.5**	--	--	**21.3**	--	--
DC-14	YVD-061020-32	6/10/2020	N	009361	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.45**	--	--	**53.0**	--	--	**22.5**	--	--
DC-14	YVD-061020-33	6/10/2020	FD	009361	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.35**	--	--	**52.0**	--	--	**22.4**	--	--
DC-14	YVD-092120-23	9/21/2020	N	013896	0.050	U	--	1.00	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.60**	--	--	**56.5**	--	--	**24.4**	--	--
DC-14	YVD-120820-21	12/8/2020	N	017137	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**6.10**	--	--	**57.5**	--	--	**26.6**	--	--
DC-14	YVD-030121-09	3/1/2021	N	119931	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**6.15**	--	--	**58.0**	--	--	**32.1**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-14	YVD-060821-33	6/8/2021	N	124212	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**6.35**	--	--	**57.0**	--	--	**27.9**	--	--
DC-14	YVD-121521-19	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-14	YVD-031522-16	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-14	YVD-060722-28	6/7/2022	N	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-14	YVD-091422-18	9/14/2022	N	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-14	YVD-122822-24	12/28/2022	N	K2215296	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-14	YVD-030623-16	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-14	YVD-062023-12	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-14	YVD-091123-10	9/11/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	YVD-02-130924	09/24/2013	N	SWI0178	0.200	U	--	0.250	U	--	--	--	--	--	--	--	**0.124**	--	--	--	--	--	**3.50**	--	--	**8.56**	--	--	**5.77**	--	--
YVD-02	YVD-02-140316	03/16/2014	N	SXC0081	0.200	U	--	0.250	U	--	**0.540**	--	--	--	--	--	--	--	--	--	--	--	**12.6**	--	--	**88.6**	--	--	**66.9**	--	--
YVD-02	YVD-02-140602	06/02/2014	N	SXF0008	0.200	U	--	**0.490**	--	--	**3.80**	--	--	--	--	--	--	--	--	--	--	--	**8.53**	--	--	**23.0**	--	--	**3.12**	--	--
YVD-02	YVD-02-140921	09/21/2014	N	SXI0148	0.200	U	--	**0.274**	--	--	**1.20**	J	FDP	--	--	--	--	--	--	--	--	--	**4.53**	--	--	**11.6**	J	FDP	**13.8**	--	--
YVD-02	YVD-D1-140921	09/21/2014	FD	SXI0148	0.200	U	--	0.250	U	--	**0.860**	J	FDP	--	--	--	--	--	--	--	--	--	**5.05**	--	--	**15.7**	J	FDP	**15.6**	--	--
YVD-02	YVD-02-141215	12/15/2014	N	SXL0103	0.200	U	--	**0.358**	--	--	**0.610**	--	--	--	--	--	--	--	--	--	--	--	**5.35**	--	--	**16.1**	--	--	**33.6**	J+	MSD, DUP
YVD-02	YVD-02-150615	06/15/2015	N	59010751	0.200	U	--	0.250	UJ	MSD	**1.10**	--	--	--	--	--	--	--	--	--	--	--	**4.10**	J+	MSD	**12.0**	J+	MSD	**3.20**	J--	MSD
YVD-02	YVD-02-150923	09/23/2015	N	59020281	0.200	U	--	**0.250**	J--	MSD	**1.00**	J+	FBK		--	--	--	--	--	--	--	--	**4.80**	--	--	**14.0**	--	--	**9.50**	--	--
YVD-02	YVD-02-151214	12/14/2015	N	59025351	0.200	U	--	**0.760**	J--	MSD	**0.680**	--	--	--	--	--	--	--	--	--	--	--	**6.30**	--	--	**25.0**	--	--	**24.0**	--	--
YVD-02	YVD-02-160308	03/08/2016	N	59029521	0.200	U	--	**0.250**	J--	MSD	**0.590**	--	--	--	--	--	--	--	--	--	--	--	**5.80**	--	--	**22.0**	--	--	**54.0**	--	--
YVD-02	YVD-02-160620	6/20/2016	N	59037101	0.200	U	--	**0.350**	J--	MSD	**0.520**	--	--	--	--	--	--	--	--	--	--	--	**4.20**	--	--	**9.70**	--	--	**8.00**	J--	MSD
YVD-02	YVD-02-160928	9/28/2016	N	K1611629	0.100	U	--	0.500	U	--	--	--	--	**0.092**	--	--	--	--	--	--	--	--	**3.41**	--	--	**5.07**	--	--	**3.13**	--	--
YVD-02	YVD-030817-15	3/8/2017	N	K1702324	0.100	U	--	0.500	U	--	--	--	--	**0.099**	--	--	--	--	--	--	--	--	**3.51**	--	--	**7.06**	--	--	**11.7**	--	--
YVD-02	YVD-060617-14	6/6/2017	N	K1705754	0.100	U	--	0.500	U	--	--	--	--	**0.093**	--	--	--	--	--	--	--	--	**3.00**	--	--	**5.95**	--	--	**3.43**	J	FDP
YVD-02	YVD-060617-16	6/6/2017	FD	K1705754	0.100	U	--	0.500	U	--	--	--	--	**0.081**	--	--	--	--	--	--	--	--	**3.00**	--	--	**5.91**	--	--	**12.2**	J	FDP
YVD-02	YVD-092617-20	9/26/2017	N	K1710333	0.100	U	--	0.500	U	--	--	--	--	**0.09**	--	--	--	--	--	--	--	--	**3.06**	--	--	**5.20**	--	--	**4.79**	--	--
YVD-02	YVD-120417-02	12/4/2017	N	K1713026	0.100	U	--	0.500	U	--	--	--	--	**0.080**	--	--	--	--	--	--	--	--	**3.18**	--	--	**9.59**	--	--	**16.1**	--	--
YVD-02	YVD-120417-04	12/4/2017	FD	K1713026	0.100	U	--	0.500	U	--	--	--	--	**0.074**	--	--	--	--	--	--	--	--	**3.08**	--	--	**9.58**	--	--	**15.8**	--	--
YVD-02	YVD-061218-32	6/12/2018	N	875438	--	R	NR	--	R	NR	--	--	--	--	--	--	--	--	--	--	R	NR	--	R	NR	--	R	NR	--	R	NR
YVD-02	YVD-060419-28	6/4/2019	N	992242	**0.240**	--	--	0.500	U	--	--	--	--	--	--	--	--	--	--	**0.100**	--	--	**5.15**	--	--	**14.8**	--	--	**39.9**	--	--
YVD-02	YVD-070219-33	7/2/2019	N	994356	**0.900**	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**6.50**	--	--	**26.8**	--	--	**47.5**	--	--
YVD-02	YVD-091019-19	9/10/2019	N	998438	0.050	U	--	UJ	MSD	--	--	--	--	--	--	--	--	--	--	**0.070**	--	--	**6.60**	--	--	**21.6**	--	--	**40.4**	--	--
YVD-02	YVD-121019-23	12/10/2019	N	902321	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**7.10**	--	--	**38.3**	--	--	**62.2**	--	--
YVD-02	YVD-040120-23	4/1/2020	N	006311	**4.38**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**6.25**	--	--	**75.0**	--	--	**96.6**	--	--
YVD-02	YVD-061120-35	6/11/2020	N	009430	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	9/21/2020	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	12/8/2020	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	3/1/2021	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	6/8/2021	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	12/15/2021	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	3/15/2022	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	6/7/2022	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	9/12/2022	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	12/5/2022	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	3/6/2023	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	6/20/2023	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	9/10/2023	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-03	YVD-03-130916	09/16/2013	N	SWI0113	**0.490**	--	--	**0.488**	--	--	--	--	--	--	--	--	**0.890**	--	--	--	--	--	**9.00**	--	--	**43.0**	--	--	**70.7**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-03	YVD-03-131210	12/10/2013	N	SWL0063	0.400	U	--	0.200	U	--	--	--	--	--	--	--	--	--	--	**1.02**	--	--	**6.67**	--	--	**40.2**	--	--	**54.8**	J--	MSD
YVD-03	YVD-03-140317	03/17/2014	N	SXC0081	0.200	U	--	0.250	U	--	**0.230**	--	--	--	--	--	--	--	--	--	--	--	**4.10**	--	--	**37.6**	--	--	**38.0**	--	--
YVD-03	YVD-03-140602	06/02/2014	N	SXF0008	0.200	U	--	**0.261**	--	--	**0.300**	--	--	--	--	--	--	--	--	--	--	--	**3.93**	--	--	**36.8**	--	--	**36.0**	--	--
YVD-03	YVD-03-140923	09/23/2014	N	SXI0158	0.200	U	--	0.250	U	--	**0.330**	J	FDP	--	--	--	--	--	--	--	--	--	**4.66**	J	FDP	**40.7**	J+	MSD	**34.7**	--	--
YVD-03	YVD-D3-140923	09/23/2014	FD	SXI0158	0.200	U	--	0.250	U	--	**0.240**	J	FDP	--	--	--	--	--	--	--	--	--	**3.62**	J	FDP	**38.0**	J+	MSD	**34.4**	--	--
YVD-03	YVD-03-141215	12/15/2014	N	SXL0108	0.200	U	--	**0.400**	--	--	**0.760**	--	--	--	--	--	--	--	--	--	--	--	**4.47**	--	--	**39.1**	--	--	**37.0**	--	--
YVD-03	YVD-03-150316	03/16/2015	N	5904541	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.90**	--	--	**39.0**	--	--	**33.0**	J--	MSD
YVD-03	YVD-03-150616	06/16/2015	N	59010751	0.200	U	--	0.250	UJ	MSD	**0.590**	--	--	--	--	--	--	--	--	--	--	--	**6.10**	J+	MSD	**37.0**	J+	MSD	**41.0**	J--	MSD
YVD-03	YVD-03-150922	09/22/2015	N	59020141	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**6.50**	--	--	**40.0**	--	--	**51.0**	--	--
YVD-03	YVD-03-151214	12/14/2015	N	59025351	0.200	U	--	0.250	UJ	MSD	**0.780**	--	--	--	--	--	--	--	--	--	--	--	**7.80**	--	--	**43.0**	--	--	**51.0**	--	--
YVD-03	YVD-03-160307	03/07/2016	N	59029521	0.200	U	--	0.250	UJ	MSD	**0.340**	--	--	--	--	--	--	--	--	--	--	--	**7.10**	--	--	**40.0**	--	--	**47.0**	--	--
YVD-03	YVD-03-160620	6/20/2016	N	59037151	0.200	U	--	0.250	U	--	**0.470**	--	--	--	--	--	--	--	--	--	--	--	**7.70**	--	--	**40.0**	--	--	**61.0**	--	--
YVD-03	YVD-03-160929	9/29/2016	N	K1611758	0.100	U	--	0.500	U	--	--	--	--	**0.047**	--	--	--	--	--	--	--	--	**6.89**	--	--	**41.4**	--	--	**44.4**	--	--
YVD-03	YVD-03-161213	12/13/2016	N	K1615045	0.100	U	--	0.500	U	--	--	--	--	**0.11**	--	--	--	--	--	--	--	--	**6.57**	--	--	**38.9**	--	--	**43.3**	--	--
YVD-03	YVD-030617-02	3/6/2017	N	K1702228	0.100	U	--	0.500	U	--	--	--	--	**0.083**	J	FDP	--	--	--	--	--	--	**6.53**	--	--	**38.5**	--	--	**40.7**	--	--
YVD-03	YVD-030617-03	3/6/2017	FD	K1702228	0.100	U	--	0.500	U	--	--	--	--	**0.061**	J	FDP	--	--	--	--	--	--	**6.48**	--	--	**38.4**	--	--	**40.7**	--	--
YVD-03	YVD-060517-13	6/5/2017	N	K1705702	0.100	U	--	0.500	U	--	--	--	--	**0.045**	--	--	--	--	--	--	--	--	**6.27**	--	--	**36.4**	--	--	**46.4**	--	--
YVD-03	YVD-092517-05	9/25/2017	N	K1710274	0.100	U	--	0.500	U	--	--	--	--	**0.038**	--	--	--	--	--	--	--	--	**6.85**	--	--	**40.9**	--	--	**46.3**	--	--
YVD-03	YVD-120517-19	12/5/2017	N	K1713091	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.047**	--	--	--	--	--	--	--	--	**6.39**	--	--	**38.0**	--	--	**50.8**	--	--
YVD-03	YVD-060518-27	6/5/2018	N	874860	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**6.70**	--	--	**39.3**	--	--	**41.7**	--	--
YVD-03	YVD-060219-07	6/2/2019	N	991939	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**6.65**	--	--	**38.5**	--	--	**26.1**	--	--
YVD-03	YVD-060820-09	6/8/2020	N	009144	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**6.65**	--	--	**39.6**	--	--	**48.6**	--	--
YVD-03	YVD-060821-24	6/8/2021	N	124212	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**6.85**	--	--	**37.6**	--	--	**33.0**	--	--
YVD-03	YVD-060822-31	6/8/2022	N	K2206299	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-03	YVD-060822-32	6/8/2022	FD	K2206299	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-03	YVD-061923-04	6/19/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-04	YVD-04-130916	09/16/2013	N	SWI0113	0.200	U	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	**4.23**	--	--	**49.2**	--	--	**39.1**	--	--
YVD-04	YVD-04-131210	12/10/2013	N	SWL0063	0.400	U	--	0.200	U	--	--	--	--	--	--	--	--	--	--	**0.112**	--	--	**4.44**	--	--	**49.9**	--	--	**42.2**	J--	MSD
YVD-04	YVD-04-140317	03/17/2014	N	SXC0081	0.200	U	--	0.250	U	--	**0.078**	--	--	--	--	--	--	--	--	--	--	--	**4.46**	--	--	**47.8**	--	--	**35.2**	--	--
YVD-04	YVD-04-140602	06/02/2014	N	SXF0008	0.400	U	--	0.250	U	--	**0.053**	--	--	--	--	--	--	--	--	--	--	--	**4.41**	--	--	**50.5**	--	--	**36.2**	--	--
YVD-04	YVD-04-140923	09/23/2014	N	SXI0158	0.200	U	--	0.250	U	--	**0.061**	--	--	--	--	--	--	--	--	--	--	--	**4.49**	--	--	**52.2**	J+	MSD	**35.8**	--	--
YVD-04	YVD-04-141215	12/15/2014	N	SXL0108	0.200	U	--	0.250	U	--	0.100	U	--	--	--	--	--	--	--	--	--	--	**4.62**	--	--	**50.0**	--	--	**35.8**	--	--
YVD-04	YVD-04-150315	03/15/2015	N	5904471	0.200	U	--	0.250	UJ	MSD	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**4.70**	--	--	**52.0**	--	--	**34.0**	--	--
YVD-04	YVD-04-150615	06/15/2015	N	59010751	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.70**	J+	MSD	**49.0**	J+	MSD	**34.0**	J--	MSD
YVD-04	YVD-04-150922	09/22/2015	N	59020141	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.60**	--	--	**51.0**	--	--	**35.0**	--	--
YVD-04	YVD-04-151213	12/13/2015	N	59025351	0.200	U	--	0.250	UJ	MSD	**0.390**	--	--	--	--	--	--	--	--	--	--	--	**4.90**	--	--	**53.0**	--	--	**36.0**	--	--
YVD-04	YVD-04-160307	03/07/2016	N	59029521	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.60**	--	--	**51.0**	--	--	**34.0**	--	--
YVD-04	YVD-04-160620	6/20/2016	N	59037101	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.80**	--	--	**53.0**	--	--	**35.0**	J--	MSD
YVD-04	YVD-D1-160620	6/20/2016	FD	59037101	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.50**	--	--	**51.0**	--	--	**36.0**	J--	MSD
YVD-04	YVD-04-160928	9/28/2016	N	K1611629	0.100	U	--	0.500	U	--	--	--	--	**0.014**	--	--	--	--	--	--	--	--	**4.42**	--	--	**48.5**	--	--	**31.4**	--	--
YVD-04	YVD-04-D3-160928	9/28/2016	FD	K1611629	0.100	U	--	0.500	U	--	--	--	--	**0.008**	J	--	--	--	--	--	--	--	**4.49**	--	--	**49.9**	--	--	**32.2**	--	--
YVD-04	YVD-04-161213	12/13/2016	N	K1615045	0.100	U	--	0.500	U	--	--	--	--	**0.026**	--	--	--	--	--	--	--	--	**4.43**	--	--	**47.5**	--	--	**31.7**	--	--
YVD-04	YVD-031017-28	3/10/2017	N	K1702448	0.100	U	--	0.500	U	--	--	--	--	**0.018**	--	--	--	--	--	--	--	--	**4.25**	--	--	**46.7**	--	--	**32.9**	--	--
YVD-04	YVD-060517-11	6/5/2017	N	K1705702	0.100	U	--	0.500	U	--	--	--	--	**0.006**	J	--	--	--	--	--	--	--	**4.05**	--	--	**44.4**	--	--	**33.4**	--	--
YVD-04	YVD-092517-07	9/25/2017	N	K1710274	0.100	U	--	0.500	U	--	--	--	--	**0.026**	--	--	--	--	--	--	--	--	**4.62**	--	--	**51.1**	--	--	**32.7**	--	--
YVD-04	YVD-120417-13	12/4/2017	N	K1713091	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.013**	--	--	--	--	--	--	--	--	**4.29**	--	--	**49.9**	--	--	**32.5**	--	--
YVD-04	YVD-060418-21	6/4/2018	N	874662	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.46**	--	--	**51.0**	--	--	**30.4**	--	--
YVD-04	YVD-060219-05	6/2/2019	N	991939	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.52**	--	--	**49.0**	--	--	**30.6**	--	--
YVD-04	YVD-060820-05	6/8/2020	N	009144	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.32**	--	--	**49.8**	--	--	**30.5**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-04	YVD-060821-22	6/8/2021	N	124212	0.050	U	--	1.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.32**	--	--	**47.4**	--	--	**29.5**	--	--
YVD-04	YVD-060622-17	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-04	YVD-061923-03	6/19/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-05	YVD-05-130917	09/17/2013	N	SWI0113	0.200	U	--	**0.435**	--	--	--	--	--	--	--	--	**1.62**	--	--	--	--	--	**6.95**	--	--	**46.2**	--	--	**76.8**	--	--
YVD-05	YVD-05-131211	12/11/2013	N	SWL0063	0.400	U	--	0.200	U	--	--	--	--	--	--	--	--	--	--	**0.462**	--	--	**3.33**	--	--	**45.5**	--	--	**68.4**	J--	MSD
YVD-05	YVD-05-140317	03/17/2014	N	SXC0081	0.400	U	--	0.250	U	--	**0.140**	--	--	--	--	--	--	--	--	--	--	--	**2.75**	--	--	**43.1**	--	--	**52.7**	--	--
YVD-05	YVD-05-140601	06/01/2014	N	SXF0008	0.400	U	--	0.250	U	--	**0.150**	--	--	--	--	--	--	--	--	--	--	--	**2.84**	--	--	**43.9**	--	--	**50.5**	--	--
YVD-05	YVD-05-140922	09/22/2014	N	SXI0148	0.400	U	--	**0.259**	--	--	**0.200**	--	--	--	--	--	--	--	--	--	--	--	**2.75**	--	--	**45.1**	--	--	**48.1**	--	--
YVD-05	YVD-05-141215	12/15/2014	N	SXL0103	0.400	U	--	**0.272**	--	--	**0.290**	J	FDP	--	--	--	--	--	--	--	--	--	**4.21**	--	--	**45.5**	--	--	**27.7**	J+	MSD, FDP, DUP
YVD-05	YVD-D1-141215	12/15/2014	FD	SXL0103	0.200	U	--	**0.264**	--	--	**0.440**	J	FDP	--	--	--	--	--	--	--	--	--	**3.54**	--	--	**44.9**	--	--	**46.0**	J+	MSD, FDP, DUP
YVD-05	YVD-05-150316	03/16/2015	N	5904471	0.400	U	--	0.250	UJ	--	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**3.60**	--	--	**47.0**	--	--	**47.0**	--	--
YVD-05	YVD-05-150616	06/16/2015	N	59010751	0.400	U	--	0.250	UJ	--	**0.510**	--	--	--	--	--	--	--	--	--	--	--	**4.00**	J+	MSD	**47.0**	J+	MSD	**49.0**	J--	MSD
YVD-05	YVD-05-150922	09/22/2015	N	59020281	0.400	U	--	--	R	MSD	**0.800**	--	--	--	--	--	--	--	--	--	--	--	**4.90**	--	--	**51.0**	--	--	**51.0**	--	--
YVD-05	YVD-05-151214	12/14/2015	N	59025351	0.400	U	--	**0.600**	J--	MSD	**0.650**	--	--	--	--	--	--	--	--	--	--	--	**4.30**	--	--	**52.0**	--	--	**48.0**	--	--
YVD-05	YVD-05-160307	03/07/2016	N	59029521	0.400	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.60**	--	--	**48.0**	--	--	**47.0**	--	--
YVD-05	YVD-D1-160307	03/07/2016	FD	59029521	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.60**	--	--	**48.0**	--	--	**48.0**	--	--
YVD-05	YVD-05-160620	6/20/2016	N	59037151	0.400	U	--	0.250	U	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.40**	--	--	**48.0**	--	--	**49.0**	--	--
YVD-05	YVD-05-160928	9/28/2016	N	K1611698	0.100	U	--	--	R	MSD	--	--	--	**0.01**	--	--	--	--	--	--	--	--	**3.54**	--	--	**48.5**	--	--	**46.7**	--	--
YVD-05	YVD-05-161215	12/15/2016	N	K1615174	0.100	U	--	0.500	U	--	--	--	--	**0.04**	--	--	--	--	--	--	--	--	**3.37**	--	--	**46.5**	--	--	**49.0**	--	--
YVD-05	YVD-031317-32	3/13/2017	N	K1702489	0.100	U	--	0.500	U	--	--	--	--	**0.03**	--	--	--	--	--	--	--	--	**3.44**	--	--	**46.0**	--	--	**41.5**	--	--
YVD-05	YVD-031317-34	3/13/2017	FD	K1702489	0.100	U	--	0.500	U	--	--	--	--	**0.02**	--	--	--	--	--	--	--	--	**3.38**	--	--	**45.6**	--	--	**41.4**	--	--
YVD-05	YVD-060617-23	6/6/2017	N	K1705754	0.100	U	--	0.500	U	--	--	--	--	**0.016**	--	--	--	--	--	--	--	--	**3.51**	--	--	**48.1**	--	--	**48.0**	--	--
YVD-05	YVD-092517-09	9/25/2017	N	K1710274	0.100	U	--	0.500	U	--	--	--	--	**0.012**	--	--	--	--	--	--	--	--	**3.61**	--	--	**48.4**	--	--	**46.6**	--	--
YVD-05	YVD-120517-15	12/5/2017	N	K1713091	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.015**	--	--	--	--	--	--	--	--	**3.36**	--	--	**46.5**	--	--	**41.8**	--	--
YVD-05	YVD-060518-29	6/5/2018	N	874860	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.58**	--	--	**46.4**	--	--	**43.6**	--	--
YVD-05	YVD-060219-09	6/2/2019	N	991939	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.62**	--	--	**44.2**	--	--	**43.6**	--	--
YVD-05	YVD-060920-15	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.66**	--	--	**46.2**	--	--	**50.0**	--	--
YVD-05	YVD-060821-26	6/8/2021	N	124212	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.94**	--	--	**47.7**	--	--	**61.1**	--	--
YVD-05	YVD-060622-19	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-05	YVD-062023-09	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-06	YVD-06-130917	09/17/2013	N	SWI0113	0.200	U	--	**0.400**	--	--	--	--	--	--	--	--	**0.410**	--	--	--	--	--	**4.07**	--	--	**17.6**	--	--	**8.14**	--	--
YVD-06	YVD-06-131209	12/09/2013	N	SWL0055	0.200	U	--	**0.620**	J	FBK, MSD, FDP	--	--	--	--	--	--	--	--	--	0.060	U	--	**1.76**	--	--	**13.0**	J	FDP	**8.53**	--	--
YVD-06	YVD-D1-131209	12/09/2013	FD	SWL0055	2.00	U	--	**0.400**	J	FBK, MSD, FDP	--	--	--	--	--	--	--	--	--	0.060	U	--	**2.24**	--	--	**16.5**	J	FDP	**9.10**	--	--
YVD-06	YVD-06-140316	03/16/2014	N	SXC0081	0.200	U	--	**0.297**	--	--	**0.140**	--	--	--	--	--	--	--	--	--	--	--	**2.68**	--	--	**16.2**	--	--	**8.33**	--	--
YVD-06	YVD-D1-140316	03/16/2014	FD	SXC0081	0.200	U	--	0.250	U	--	**0.130**	--	--	--	--	--	--	--	--	--	--	--	**2.74**	--	--	**16.6**	--	--	**8.18**	--	--
YVD-06	YVD-06-140601	06/01/2014	N	SXF0008	0.200	U	--	0.250	U	--	**0.064**	--	--	--	--	--	--	--	--	--	--	--	**2.28**	--	--	**16.7**	--	--	**7.59**	--	--
YVD-06	YVD-D1-140601	06/01/2014	FD	SXF0008	0.200	U	--	0.250	U	--	**0.057**	--	--	--	--	--	--	--	--	--	--	--	**2.30**	--	--	**16.9**	--	--	**7.63**	--	--
YVD-06	YVD-06-140921	09/21/2014	N	SXI0148	0.200	U	--	**0.359**	--	--	**0.180**	--	--	--	--	--	--	--	--	--	--	--	**2.69**	--	--	**17.4**	--	--	**7.98**	--	--
YVD-06	YVD-06-141215	12/15/2014	N	SXL0103	0.200	U	--	0.250	U	--	0.100	U	--	--	--	--	--	--	--	--	--	--	**2.58**	--	--	**16.9**	--	--	**7.47**	J+	MSD, DUP
YVD-06	YVD-06-150316	03/16/2015	N	5904471	0.200	U	--	0.250	UJ	MSD	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**2.20**	--	--	**17.0**	--	--	**10.0**	--	--
YVD-06	YVD-06-150616	06/16/2015	N	59010751	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.20**	J+	MSD	**17.0**	J+	MSD	**7.90**	J--	MSD
YVD-06	YVD-06-150922	09/22/2015	N	59020141	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.10**	--	--	**17.0**	--	--	**7.90**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-06	YVD-06-151214	12/14/2015	N	59025351	0.200	U	--	**0.570**	J--	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.40**	--	--	**18.0**	--	--	**8.00**	--	--
YVD-06	YVD-06-160307	03/07/2016	N	59029521	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.50**	--	--	**17.0**	--	--	**7.80**	--	--
YVD-06	YVD-06-160620	6/20/2016	N	59037151	0.200	U	--	**0.420**	--	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.30**	--	--	**17.0**	--	--	**8.10**	--	--
YVD-06	YVD-06-160929	9/29/2016	N	K1611704	0.100	U	--	0.500	U	--	--	--	--	**0.022**	--	--	--	--	--	--	--	--	**2.26**	--	--	**17.1**	--	--	**8.55**	--	--
YVD-06	YVD-06-161215	12/15/2016	N	K1615126	0.100	U	--	0.500	U	--	--	--	--	**0.010**	--	--	--	--	--	--	--	--	**2.12**	--	--	**17.1**	--	--	**10.2**	--	--
YVD-06	YVD-030617-04	3/6/2017	N	K1702228	0.100	U	--	0.500	U	FBK	--	--	--	**0.014**	--	--	--	--	--	--	--	--	**2.20**	--	--	**17.0**	--	--	**8.38**	--	--
YVD-06	YVD-060617-21	6/6/2017	N	K1705754	0.100	U	--	0.500	U	--	--	--	--	**0.010**	J	--	--	--	--	--	--	--	**2.17**	--	--	**16.3**	--	--	**8.44**	--	--
YVD-06	YVD-092617-17	9/26/2017	N	K1710333	0.100	U	--	0.500	U	--	--	--	--	**0.009**	J	--	--	--	--	--	--	--	**1.97**	--	--	**15.6**	--	--	**9.61**	--	--
YVD-06	YVD-092617-18	9/26/2017	FD	K1710333	0.100	U	--	0.500	U	--	--	--	--	**0.010**	J	--	--	--	--	--	--	--	**2.03**	--	--	**16.1**	--	--	**9.58**	--	--
YVD-06	YVD-120517-17	12/5/2017	N	K1713091	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.021**	--	--	--	--	--	--	--	--	**2.11**	--	--	**17.3**	--	--	**9.87**	--	--
YVD-06	YVD-060318-15	6/3/2018	N	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.36**	--	--	**17.3**	--	--	**7.86**	--	--
YVD-06	YVD-060219-11	6/2/2019	N	991939	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.20**	--	--	**16.6**	--	--	**6.42**	--	--
YVD-06	YVD-060920-17	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.16**	--	--	**17.6**	--	--	**8.86**	--	--
YVD-06	YVD-060721-19	6/7/2021	N	124105	0.050	U	--	0.500	UJ	MS, RPD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.28**	--	--	**16.2**	--	--	**6.80**	--	--
YVD-06	YVD-062023-06	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-06	YVD-062023-07	6/20/2023	FD	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-07	YVD-07-130923	09/23/2013	N	SWI0178	--	--	--	**0.395**	--	--	--	--	--	--	--	--	**0.516**	--	--	--	--	--	**5.03**	--	--	**37.7**	--	--	--	--	--
YVD-07	YVD-07-130926	09/26/2013	N	SWI0190	0.200	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**37.4**	--	--
YVD-07	YVD-07-131210	12/10/2013	N	SWL0055	0.200	U	--	0.200	UJ	MSD	--	--	--	--	--	--	--	--	--	0.060	U	--	1.00	U	--	**40.4**	--	--	**50.0**	--	--
YVD-07	YVD-07-140316	03/16/2014	N	SXC0081	0.200	U	--	0.250	U	--	**0.220**	--	--	--	--	--	--	--	--	--	--	--	**4.45**	--	--	**42.5**	--	--	**69.2**	--	--
YVD-07	YVD-07-140604	06/04/2014	N	SXF0025	0.400	U	--	**0.348**	J--	MSD	**0.690**	--	--	--	--	--	--	--	--	--	--	--	**5.57**	--	--	**44.5**	--	--	**57.0**	--	--
YVD-07	YVD-07-140922	09/22/2014	N	SXI0158	0.400	U	--	0.250	U	--	**0.200**	--	--	--	--	--	--	--	--	--	--	--	**4.05**	--	--	**42.7**	J+	MSD	**51.8**	--	--
YVD-07	YVD-07-141216	12/16/2014	N	SXL0108	0.400	U	--	0.250	U	--	0.100	U	--	--	--	--	--	--	--	--	--	--	**3.83**	--	--	**40.6**	--	--	**51.2**	--	--
YVD-07	YVD-07-150316	03/16/2015	N	5904541	0.400	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.30**	--	--	**50.0**	--	--	**73.0**	J--	MSD
YVD-07	YVD-D2-150316	03/16/2015	FD	5904541	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.30**	--	--	**48.0**	--	--	**70.0**	J--	MSD
YVD-07	YVD-07-150616	06/16/2015	N	59010751	0.400	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.20**	J+	MSD	**43.0**	J+	MSD	**74.0**	J--	MSD
YVD-07	YVD-D1-150616	06/16/2015	FD	59010751	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.20**	J+	MSD	**44.0**	J+	MSD	**74.0**	J--	MSD
YVD-07	YVD-07-150923	09/23/2015	N	59020281	0.400	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.20**	--	--	**48.0**	--	--	**68.0**	--	--
YVD-07	YVD-07-151214	12/14/2015	N	59025431	0.400	U	--	--	R	MSD	**0.970**	J	FDP	--	--	--	--	--	--	--	--	--	**4.50**	--	--	**48.0**	--	--	**59.0**	--	--
YVD-07	YVD-07-160308	03/08/2016	N	59029711	0.400	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.00**	--	--	**42.0**	--	--	**49.0**	J+	MSD
YVD-07	YVD-07-160621	6/21/2016	N	59037151	0.400	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.50**	--	--	**37.0**	--	--	**31.0**	--	--
YVD-07	YVD-07-160929	9/29/2016	N	K1611704	0.100	U	--	0.500	U	--	--	--	--	**0.020**	--	--	--	--	--	--	--	--	**3.31**	--	--	**34.0**	--	--	**37.1**	--	--
YVD-07	YVD-07-161213	12/13/2016	N	K1615083	0.100	U	--	0.500	U	--	--	--	--	**0.010**	J	--	--	--	--	--	--	--	**3.59**	--	--	**36.6**	--	--	**64.0**	--	--
YVD-07	YVD-030717-07	3/7/2017	N	K1702324	0.100	UJ	HTQ	0.500	U	--	--	--	--	**0.019**	--	--	--	--	--	--	--	--	**2.83**	--	--	**31.4**	--	--	**25.4**	--	--
YVD-07	YVD-060517-15	6/5/2017	N	K1705754	0.100	U	--	0.500	U	--	--	--	--	**0.004**	J	--	--	--	--	--	--	--	**2.98**	--	--	**32.9**	--	--	**33.5**	--	--
YVD-07	YVD-092617-21	9/26/2017	N	K1710333	0.100	U	--	0.500	U	--	--	--	--	**0.022**	--	--	--	--	--	--	--	--	**3.26**	--	--	**34.0**	--	--	**51.0**	--	--
YVD-07	YVD-120417-11	12/4/2017	N	K1713026	0.100	U	--	0.500	U	--	--	--	--	**0.022**	--	--	--	--	--	--	--	--	**3.56**	--	--	**36.1**	--	--	**56.5**	--	--
YVD-07	YVD-060418-23	6/4/2018	N	874662	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.76**	--	--	**39.4**	--	--	**63.5**	--	--
YVD-07	YVD-060319-16	6/3/2019	N	992053	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.76**	--	--	**35.8**	--	--	**27.6**	--	--
YVD-07	YVD-060920-27	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.27**	--	--	**41.8**	--	--	**62.9**	--	--
YVD-07	YVD-060821-34	6/8/2021	N	124212	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.28**	--	--	**37.6**	--	--	**40.8**	--	--
YVD-07	YVD-060622-21	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-07	YVD-060622-22	6/6/2022	FD	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-07	YVD-062023-19	6/20/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-08	YVD-08-130919	09/19/2013	N	SWI0138	2.00	U	--	**0.935**	J+	FBK	--	--	--	--	--	--	0.100	U	--	--	--	--	**6.03**	--	--	**88.3**	--	--	**105**	--	--
YVD-08	YVD-08-131211	12/11/2013	N	SWL0063	2.00	U	--	0.750	U	ERL	--	--	--	--	--	--	--	--	--	**1.46**	--	--	**7.55**	--	--	**82.2**	--	--	**273**	J--	MSD
YVD-08	YVD-08-140317	03/17/2014	N	SXC0095	2.00	U	--	**0.702**	--	--	**0.130**	--	--	--	--	--	--	--	--	--	--	--	**5.30**	--	--	**75.1**	--	--	**173**	J--	MSD

Table 8
Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-08	YVD-08-140602	06/02/2014	N	SXF0017	0.800	U	--	**1.12**	--	--	**2.70**	--	--	--	--	--	--	--	--	--	--	--	**11.2**	--	--	**78.3**	--	--	**175**	J--	MSD
YVD-08	YVD-08-140923	09/23/2014	N	SXI0173	1.00	U	--	**0.867**	J+	MSD	**0.350**	--	--	--	--	--	--	--	--	--	--	--	**5.87**	--	--	**76.9**	--	--	**107**	--	--
YVD-08	YVD-08-141216	12/16/2014	N	SXL0108	1.00	U	--	**0.369**	--	--	**0.340**	--	--	--	--	--	--	--	--	--	--	--	**5.92**	--	--	**77.2**	--	--	**140**	--	--
YVD-08	YVD-08-150317	03/17/2015	N	5904541	1.00	U	--	**0.390**	J--	MSD	**0.670**	--	--	--	--	--	--	--	--	--	--	--	**5.90**	--	--	**77.0**	--	--	**130**	J--	MSD
YVD-08	YVD-D3-150317	03/17/2015	FD	5904541	0.200	U	--	0.250	UJ	MSD	**0.490**	--	--	--	--	--	--	--	--	--	--	--	**5.70**	--	--	**76.0**	--	--	**150**	J--	MSD
YVD-08	YVD-08-150617	06/17/2015	N	59010961	1.00	U	--	**0.260**	J--	MSD, FDP	**0.530**	--	--	--	--	--	--	--	--	--	--	--	**6.00**	J+	MSD	**82.0**	J+	MSD	**140**	--	--
YVD-08	YVD-D3-150617	06/17/2015	FD	59010961	0.200	U	--	**0.860**	J--	MSD, FDP	**0.390**	--	--	--	--	--	--	--	--	--	--	--	**5.70**	J+	MSD	**77.0**	J+	MSD	**170**	--	--
YVD-08	YVD-08-150924	09/24/2015	N	59020391	1.00	U	--	0.250	UJ	MSD	**0.310**	--	--	--	--	--	--	--	--	--	--	--	**5.60**	--	--	**82.0**	--	--	**170**	J--	MSD
YVD-08	YVD-08-151215	12/15/2015	N	59025501	1.00	U	--	--	R	MSD	**0.330**	J--	MSD	--	--	--	--	--	--	--	--	--	**6.20**	--	--	**85.0**	--	--	**190**	--	--
YVD-08	YVD-D3-151215	12/15/2015	FD	59025501	0.200	U	--	--	R	MSD	**0.270**	J--	MSD	--	--	--	--	--	--	--	--	--	**6.20**	--	--	**85.0**	--	--	**180**	--	--
YVD-08	YVD-08-160310	03/10/2016	N	59029941	1.00	U	--	0.250	UJ	FDP, MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**5.60**	--	--	**87.0**	--	--	**210**	J	DUP
YVD-08	YVD-08-160622	6/22/2016	N	59037271	1.00	U	--	--	R	MSD	**0.310**	--	--	--	--	--	--	--	--	--	--	--	**5.90**	--	--	**87.0**	--	--	**200**	--	--
YVD-08	YVD-D3-160622	6/22/2016	FD	59037271	0.200	U	--	--	R	MSD	**0.280**	--	--	--	--	--	--	--	--	--	--	--	**6.00**	--	--	**88.0**	--	--	**200**	--	--
YVD-08	YVD-08-160927	9/27/2016	N	K1611565	0.100	U	--	--	R	MSD	--	--	--	**0.049**	--	--	--	--	--	--	--	--	**4.95**	--	--	**84.7**	--	--	**193**	--	--
YVD-08	YVD-08-161213	12/13/2016	N	K1615045	0.100	U	--	0.500	U	--	--	--	--	**0.058**	--	--	--	--	--	--	--	--	**5.10**	--	--	**84.5**	--	--	**182**	--	--
YVD-08	YVD-030917-24	3/9/2017	N	K1702448	0.100	U	--	0.500	U	--	--	--	--	**0.018**	--	--	--	--	--	--	--	--	**4.95**	--	--	**83.4**	--	--	**203**	--	--
YVD-08	YVD-060717-29	6/7/2017	N	K1705833	0.100	U	--	0.500	U	--	--	--	--	**0.025**	--	--	--	--	--	--	--	--	**5.13**	--	--	**92.1**	--	--	**194**	--	--
YVD-08	YVD-092617-19	9/26/2017	N	K1710333	0.100	U	--	0.500	U	--	--	--	--	**0.01**	--	--	--	--	--	--	--	--	**5.12**	--	--	**89.3**	--	--	**213**	--	--
YVD-08	YVD-120517-23	12/5/2017	N	K1713157	0.100	U	--	0.500	U	--	--	--	--	**0.013**	--	--	--	--	--	--	--	--	**5.23**	--	--	**93.2**	--	--	**184**	--	--
YVD-08	YVD-031918-15	3/19/2018	N	870634	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.40**	--	--	**90.5**	--	--	**183**	--	--
YVD-08	YVD-060518-31	6/5/2018	N	874860	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.55**	--	--	**98.0**	--	--	**197**	--	--
YVD-08	YVD-090918-04	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.70**	--	--	**99.5**	--	--	**195**	--	--
YVD-08	YVD-121118-19	12/11/2018	N	884939	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**6.00**	--	--	**98.5**	--	--	**207**	--	--
YVD-08	YVD-031719-03	3/17/2019	N	988239	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.50**	--	--	**96.0**	--	--	**203**	--	--
YVD-08	YVD-060319-21	6/3/2019	N	992053	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.55**	--	--	**97.5**	--	--	**190**	--	--
YVD-08	YVD-090919-02	9/9/2019	N	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.45**	--	--	**91.5**	--	--	**184**	--	--
YVD-08	YVD-120919-02	12/9/2019	N	902276	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.55**	--	--	**96.5**	J	MSD	**177**	--	--
YVD-08	YVD-120919-04	12/9/2019	FD	902276	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.55**	--	--	**96.0**	J	MSD	**173**	--	--
YVD-08	YVD-033120-17	3/31/2020	N	006260	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.35**	--	--	**99.0**	--	--	**184**	--	--
YVD-08	YVD-060920-23	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.50**	--	--	**106**	--	--	**176**	--	--
YVD-08	YVD-092120-11	9/21/2020	N	013896	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.60**	--	--	**104**	--	--	**179**	--	--
YVD-08	YVD-120720-11	12/7/2020	N	017035	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**6.05**	--	--	**104**	--	--	**174**	--	--
YVD-08	YVD-030121-07	3/1/2021	N	119931	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.55**	--	--	**102**	--	--	**177**	--	--
YVD-08	YVD-060821-28	6/8/2021	N	124212	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.45**	--	--	**102**	--	--	**179**	--	--
YVD-08	YVD-121521-20	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-08	YVD-031522-12	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-08	YVD-060722-27	6/7/2022	N	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-08	YVD-091322-05	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-08	YVD-122722-19	12/27/2022	N	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-08	YVD-030623-13	3/6/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-08	YVD-062123-28	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-08	YVD-091023-01	9/10/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-09	YVD-09-130919	09/19/2013	N	SWI0138	2.00	U	--	--	R	FBK	--	--	--	--	--	--	--	R	FBK	--	--	--	**8.21**	--	--	**189**	--	--	**236**	--	--
YVD-09	YVD-09-131212	12/12/2013	N	SWL0078	2.00	U	--	0.661	U	ERL	--	--	--	--	--	--	--	--	--	**0.647**	--	--	**9.21**	--	--	**176**	--	--	**193**	--	--
YVD-09	YVD-09-140319	03/19/2014	N	SXC0107	2.00	U	--	**0.653**	J--	MSD	**0.530**	--	--	--	--	--	--	--	--	--	--	--	**9.33**	--	--	**173**	--	--	**214**	--	--
YVD-09	YVD-09-140603	06/03/2014	N	SXF0025	2.00	U	--	**0.613**	J--	MSD	**0.720**	--	--	--	--	--	--	--	--	--	--	--	**10.1**	--	--	**193**	--	--	**214**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-09	YVD-09-140924	09/24/2014	N	SXI0173	2.00	U	--	**0.502**	J+	MSD	**0.320**	J+	FBK	--	--	--	--	--	--	--	--	--	**8.88**	--	--	**203**	--	--	**166**	--	--
YVD-09	YVD-09-141217	12/17/2014	N	SXL0121	2.00	U	--	0.250	UJ	MSD	**1.30**	--	--	--	--	--	--	--	--	--	--	--	**12.9**	--	--	**187**	--	--	**223**	--	--
YVD-09	YVD-09-150318	03/18/2015	N	5904651	2.00	U	--	0.250	UJ	MSD	**0.380**	--	--	--	--	--	--	--	--	--	--	--	**9.30**	J--	MSD	**190**	--	--	**190**	--	--
YVD-09	YVD-09-150617	06/17/2015	N	59010961	2.00	U	--	**0.370**	J--	MSD	**0.360**	--	--	--	--	--	--	--	--	--	--	--	**9.80**	J+	MSD	**190**	J+	MSD	**230**	--	--
YVD-09	YVD-09-150923	09/23/2015	N	59020391	0.200	U	--	**0.260**	J--	MSD	**0.270**	--	--	--	--	--	--	--	--	--	--	--	**9.60**	--	--	**180**	--	--	**270**	J--	MSD
YVD-09	YVD-09-151215	12/15/2015	N	59025501	2.00	U	--	--	R	MSD	**0.250**	J--	MSD	--	--	--	--	--	--	--	--	--	**9.60**	--	--	**190**	--	--	**250**	--	--
YVD-09	YVD-09-160310	03/10/2016	N	59029941	2.00	U	--	0.250	UJ	FDP, MSD	**0.330**	--	--	--	--	--	--	--	--	--	--	--	**9.20**	--	--	**190**	--	--	**250**	J	DUP
YVD-09	YVD-09-160622	6/22/2016	N	59037271	2.00	U	--	--	R	MSD	**0.290**	--	--	--	--	--	--	--	--	--	--	--	**8.90**	--	--	**190**	--	--	**260**	--	--
YVD-09	YVD-09-160929	9/29/2016	N	K1611704	0.100	U	--	0.500	U	--	--	--	--	**0.016**	--	--	--	--	--	--	--	--	**7.62**	--	--	**184**	--	--	**243**	--	--
YVD-09	YVD-09-161213	12/13/2016	N	K1615045	0.100	U	--	0.500	U	--	--	--	--	**0.048**	--	--	--	--	--	--	--	--	**8.42**	--	--	**185**	--	--	**238**	--	--
YVD-09	YVD-D2-161213	12/13/2016	FD	K1615045	0.100	U	--	0.500	U	--	--	--	--	**0.078**	--	--	--	--	--	--	--	--	**8.04**	--	--	**181**	--	--	**240**	--	--
YVD-09	YVD-031317-35	3/13/2017	N	K1702489	**0.040**	J	--	0.500	U	--	--	--	--	**0.025**	--	--	--	--	--	--	--	--	**7.78**	--	--	**185**	--	--	**225**	--	--
YVD-09	YVD-060517-08	6/5/2017	N	K1705702	0.100	U	--	0.500	U	--	--	--	--	**0.007**	J	--	--	--	--	--	--	--	**6.98**	--	--	**163**	--	--	**237**	--	--
YVD-09	YVD-092617-29	9/26/2017	N	K1710381	0.100	U	--	0.500	U	--	--	--	--	**0.029**	--	--	--	--	--	--	--	--	**8.07**	--	--	**175**	--	--	**223**	--	--
YVD-09	YVD-092617-30	9/26/2017	FD	K1710381	0.100	U	--	0.500	U	--	--	--	--	**0.039**	--	--	--	--	--	--	--	--	**8.11**	--	--	**176**	--	--	**224**	--	--
YVD-09	YVD-120517-21	12/5/2017	N	K1713091	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.009**	J	--	--	--	--	--	--	--	**7.27**	--	--	**174**	--	--	**211**	--	--
YVD-09	YVD-031918-18	3/19/2018	N	870634	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**7.80**	--	--	**166**	--	--	**180**	--	--
YVD-09	YVD-060318-13	6/3/2018	N	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**8.35**	--	--	**182**	--	--	**182**	--	--
YVD-09	YVD-090918-06	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**8.10**	--	--	**174**	--	--	**172**	--	--
YVD-09	YVD-121118-15	12/11/2018	N	884939	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**8.60**	--	--	**172**	--	--	**166**	--	--
YVD-09	YVD-121118-17	12/11/2018	FD	884939	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**8.75**	--	--	**175**	--	--	**170**	--	--
YVD-09	YVD-031719-05	3/17/2019	N	988239	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**8.05**	--	--	**166**	--	--	**162**	--	--
YVD-09	YVD-060319-15	6/3/2019	N	992053	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**8.00**	--	--	**166**	--	--	**146**	--	--
YVD-09	YVD-090919-04	9/9/2019	N	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**8.20**	--	--	**160**	--	--	**148**	--	--
YVD-09	YVD-120919-06	12/9/2019	N	902276	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U		**8.40**	--	--	**166**	J	MSD	**143**	--	--
YVD-09	YVD-033020-05	3/30/2020	N	006241	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**7.95**	--	--	**163**	--	--	**150**	--	--
YVD-09	YVD-060920-24	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**7.90**	--	--	**167**	--	--	**158**	--	--
YVD-09	YVD-092120-16	9/21/2020	N	013896	0.050	U	--	2.50	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**7.85**	--	--	**164**	--	--	**151**	--	--
YVD-09	YVD-120720-13	12/7/2020	N	017035	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**8.65**	--	--	**164**	--	--	**159**	--	--
YVD-09	YVD-030121-05	3/1/2021	N	119931	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**8.05**	--	--	**161**	--	--	**152**	--	--
YVD-09	YVD-060721-18	6/7/2021	N	124105	0.050	U	--	5.00	UJ	MS, RPD	--	--	--	--	--	--	--	--	--	0.070	U	--	**8.15**	--	--	**157**	--	--	**135**	--	--
YVD-09	YVD-121421-09	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-09	YVD-031522-14	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-09	YVD-060622-12	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-09	YVD-091322-07	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-09	YVD-120822-15	12/8/2022	N	K2214578	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-09	YVD-030623-19	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-09	YVD-062123-30	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-09	YVD-091123-07	9/11/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-09	YVD-091123-09	9/11/2023	FD	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-10	YVD-10-130917	09/17/2013	N	SWI0123	2.00	U	--	0.250	U	--	--	--	--	--	--	--	**0.148**	--	--	--	--	--	**3.28**	--	--	**104**	--	--	**199**	--	--
YVD-10	YVD-10-131212	12/12/2013	N	SWL0078	2.00	U	--	0.650	U	ERL	--	--	--	--	--	--	--	--	--	**1.40**	--	--	**4.49**	--	--	**102**	--	--	**174**	--	--
YVD-10	YVD-10-140319	03/19/2014	N	SXC0107	2.00	U	--	**0.507**	J--	MSD	**0.770**	--	--	--	--	--	--	--	--	--	--	--	**3.93**	--	--	**96.8**	--	--	**163**	--	--
YVD-10	YVD-10-140603	06/03/2014	N	SXF0025	2.00	U	--	**0.577**	J--	MSD	**0.800**	--	--	--	--	--	--	--	--	--	--	--	**4.07**	--	--	**103**	--	--	**188**	--	--
YVD-10	YVD-10-140924	09/24/2014	N	SXI0173	2.00	U	--	**0.443**	J+	MSD	**0.480**	J+	FBK	--	--	--	--	--	--	--	--	--	**3.86**	--	--	**116**	--	--	**217**	--	--
YVD-10	YVD-10-141217	12/17/2014	N	SXL0144	2.00	U	--	--	R	MSD	**0.690**	J--	MSD	--	--	--	--	--	--	--	--	--	**3.88**	--	--	**110**	--	--	**180**	--	--
YVD-10	YVD-10-150318	03/18/2015	N	5904651	2.00	U	--	0.250	UJ	MSD	**0.420**	--	--	--	--	--	--	--	--	--	--	--	**4.00**	J--	MSD	**130**	--	--	**370**	--	--
YVD-10	YVD-10-150617	06/17/2015	N	59010961	2.00	U	--	**0.440**	J--	MSD	**0.720**	--	--	--	--	--	--	--	--	--	--	--	**4.60**	J+	MSD	**130**	J+	MSD	**110**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-10	YVD-10-150923	09/23/2015	N	59020391	2.00	U	--	0.250	UJ	MSD	**0.560**	--	--	--	--	--	--	--	--	--	--	--	**4.30**	--	--	**120**	--	--	**370**	J--	MSD
YVD-10	YVD-10-151214	12/14/2015	N	59025351	2.00	U	--	0.250	UJ	MSD	**0.580**	--	--	--	--	--	--	--	--	--	--	--	**4.30**	--	--	**120**	--	--	**360**	--	--
YVD-10	YVD-10-160309	03/09/2016	N	59029711	2.00	U	--	--	R	MSD	**0.420**	--	--	--	--	--	--	--	--	--	--	--	**4.10**	--	--	**120**	--	--	**280**	J+	MSD
YVD-10	YVD-10-160621	6/21/2016	N	59037271	2.00	U	--	--	R	MSD	**0.710**	--	--	--	--	--	--	--	--	--	--	--	**4.50**	--	--	**110**	--	--	**240**	--	--
YVD-10	YVD-10-160929	9/29/2016	N	K1611698	0.100	U	--	--	R	MSD	--	--	--	**0.028**	--	--	--	--	--	--	--	--	**2.48**	--	--	**114**	--	--	**223**	--	--
YVD-10	YVD-10-161212	12/12/2016	N	K1615029	0.100	U	--	0.500	U	--	--	--	--	**0.074**	--	--	--	--	--	--	--	--	**2.68**	--	--	**118**	--	--	**191**	--	--
YVD-10	YVD-030917-27	3/9/2017	N	K1702448	0.100	U	--	0.500	U	--	--	--	--	**0.066**	--	--	--	--	--	--	--	--	**2.89**	--	--	**133**	--	--	**799**	--	--
YVD-10	YVD-060617-22	6/6/2017	N	K1705754	0.100	U	--	0.500	U	--	--	--	--	**0.036**	--	--	--	--	--	--	--	--	**2.57**	--	--	**119**	--	--	**368**	--	--
YVD-10	YVD-092617-31	9/26/2017	N	K1710381	0.100	U	--	0.500	U	--	--	--	--	**0.011**	--	--	--	--	--	--	--	--	**2.56**	--	--	**111**	--	--	**265**	--	--
YVD-10	YVD-120517-30	12/5/2017	N	K1713091	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.023**	--	--	--	--	--	--	--	--	**2.37**	--	--	**114**	--	--	**224**	--	--
YVD-10	YVD-031818-06	3/18/2018	N	870610	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.60**	--	--	**123**	--	--	**202**	--	--
YVD-10	YVD-060318-06	6/3/2018	N	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.93**	--	--	**118**	--	--	**208**	--	--
YVD-10	YVD-090918-13	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.58**	--	--	**114**	--	--	**238**	--	--
YVD-10	YVD-121018-08	12/10/2018	N	884857	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.64**	--	--	**112**	--	--	**196**	--	--
YVD-10	YVD-031819-16	3/18/2019	N	988273	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	**0.070**	--	--	**2.62**	--	--	**108**	--	--	**196**	--	--
YVD-10	YVD-060319-18	6/3/2019	N	992053	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.56**	--	--	**106**	--	--	**220**	--	--
YVD-10	YVD-091019-20	9/10/2019	N	998438	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.49**	--	--	**104**	--	--	**165**	--	--
YVD-10	YVD-121019-21	12/10/2019	N	902321	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.94**	--	--	**102**	--	--	**199**	--	--
YVD-10	YVD-033020-08	3/30/2020	N	006241	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.64**	--	--	**100**	--	--	**183**	--	--
YVD-10	YVD-060920-12	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.71**	--	--	**108**	--	--	**224**	--	--
YVD-10	YVD-092020-08	9/20/2020	N	013864	0.050	U	--	0.500	U	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.73**	--	--	**102**	--	--	**229**	--	--
YVD-10	YVD-120720-12	12/7/2020	N	017035	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.24**	--	--	**106**	--	--	**288**	--	--
YVD-10	YVD-030121-12	3/1/2021	N	119931	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.34**	--	--	**134**	--	--	**896**	--	--
YVD-10	YVD-060621-07	6/6/2021	N	124053	0.050	U	--	5.00	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.80**	--	--	**106**	--	--	**219**	--	--
YVD-10	YVD-121421-06	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-10	YVD-031422-06	3/14/2022	N	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-10	YVD-060522-06	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-10	YVD-091422-20	9/14/2022	N	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-10	YVD-120722-11	12/7/2022	N	K2214479	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-10	YVD-030623-10	3/6/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-10	YVD-062123-26	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-10	YVD-091023-03	9/10/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-10	YVD-091023-05	9/10/2023	FD	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-11	YVD-11-130923	09/23/2013	N	SWI0178	--	--	--	0.250	U	--	--	--	--	--	--	--	0.100	UJ	FDP	--	--	--	**5.44**	J	FDP	**23.2**	--	--	--	--	--
YVD-11	YVD-D2-130923	09/23/2013	FD	SWI0178	--	--	--	0.250	U	--	--	--	--	--	--	--	**0.753**	J	FDP	--	--	--	**3.60**	J	FDP	**23.0**	--	--	--	--	--
YVD-11	YVD-11-130926	09/26/2013	N	SWI0190	2.00	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**207**	--	--
YVD-11	YVD-D3-130926	09/26/2013	FD	SWI0190	2.00	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**228**	--	--
YVD-11	YVD-11-131212	12/12/2013	N	SWL0073	2.00	U	--	0.200	UJ	MSD	--	--	--	--	--	--	--	--	--	**0.245**	--	--	**3.37**	--	--	**23.2**	--	--	**208**	--	--
YVD-11	YVD-11-140318	03/18/2014	N	SXC0107	2.00	U	--	**0.503**	J--	MSD	**0.170**	--	--	--	--	--	--	--	--	--	--	--	**3.15**	--	--	**22.2**	--	--	**193**	--	--
YVD-11	YVD-11-140603	06/03/2014	N	SXF0017	2.00	U	--	**0.564**	--	--	**0.840**	--	--	--	--	--	--	--	--	--	--	--	**5.38**	--	--	**26.1**	--	--	**203**	J--	MSD
YVD-11	YVD-11-140924	09/24/2014	N	SXI0173	1.00	U	--	**0.453**	J+	MSD	**0.170**	J+	FBK	--	--	--	--	--	--	--	--	--	**3.86**	--	--	**25.6**	--	--	**159**	--	--
YVD-11	YVD-11-141217	12/17/2014	N	SXL0121	2.00	U	--	0.250	UJ	MSD	**0.460**	--	--	--	--	--	--	--	--	--	--	--	**4.77**	--	--	**25.6**	--	--	**158**	--	--
YVD-11	YVD-11-150317	03/17/2015	N	5904651	2.00	U	--	0.250	UJ	MSD	**0.300**	--	--	--	--	--	--	--	--	--	--	--	**4.30**	J--	MSD	**26.0**	--	--	**150**	--	--
YVD-11	YVD-11-150616	06/16/2015	N	59010961	2.00	U	--	**0.310**	J--	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.20**	J+	MSD	**27.0**	J+	MSD	**140**	--	--
YVD-11	YVD-11-150923	09/23/2015	N	59020281	2.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.40**	--	--	**25.0**	--	--	**130**	--	--
YVD-11	YVD-11-151215	12/15/2015	N	59025431	2.00	U	--	--	R	MSD	**0.590**	J	FDP	--	--	--	--	--	--	--	--	--	**5.20**	--	--	**25.0**	--	--	**140**	--	--
YVD-11	YVD-D2-151215	12/15/2015	FD	59025431	0.200	U	--	--	R	MSD	**1.50**	J	FDP	--	--	--	--	--	--	--	--	--	**4.90**	--	--	**25.0**	--	--	**130**	--	--
YVD-11	YVD-11-160309	03/09/2016	N	59029711	2.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.30**	--	--	**25.0**	--	--	**140**	J+	MSD
YVD-11	YVD-11-160621	6/21/2016	N	59037151	2.00	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.50**	--	--	**27.0**	--	--	**130**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-11	YVD-11-160927	9/27/2016	N	K1611629	0.100	U	--	0.500	U	--	--	--	--	**0.071**	--	--	--	--	--	--	--	--	**3.13**	--	--	**26.1**	--	--	**100**	--	--
YVD-11	YVD-11-161214	12/14/2016	N	K1615126	0.100	U	--	0.500	U	--	--	--	--	**0.421**	--	--	--	--	--	--	--	--	**4.82**	--	--	**25.6**	--	--	**104**	--	--
YVD-11	YVD-031317-37	3/13/2017	N	K1702489	**0.060**	J	--	0.500	U	--	--	--	--	**0.016**	--	--	--	--	--	--	--	--	**3.02**	--	--	**25.5**	--	--	**99.8**	--	--
YVD-11	YVD-060517-10	6/5/2017	N	K1705702	0.100	U	--	0.500	U	--	--	--	--	**0.029**	--	--	--	--	--	--	--	--	**2.98**	--	--	**24.9**	--	--	**133**	--	--
YVD-11	YVD-092617-26	9/26/2017	N	K1710381	0.100	UJ	HTQ	0.500	U	--	--	--	--	**0.006**	J	--	--	--	--	--	--	--	**3.24**	--	--	**28.8**	--	--	**219**	--	--
YVD-11	YVD-120417-06	12/4/2017	N	K1713026	0.100	U	--	0.500	U	--	--	--	--	0.015	U	MBK	--	--	--	--	--	--	**2.78**	--	--	**25.8**	--	--	**124**	--	--
YVD-11	YVD-031918-12	3/19/2018	N	870634	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.98**	--	--	**26.0**	--	--	**103**	--	--
YVD-11	YVD-031918-14	3/19/2018	FD	870634	0.050	U	--	--	--	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.94**	--	--	**25.8**	--	--	**100**	--	--
YVD-11	YVD-060418-14	6/4/2018	N	874662	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.26**	--	--	**28.4**	--	--	**91.2**	--	--
YVD-11	YVD-060418-16	6/4/2018	FD	874662	0.050	U	--	**0.600**	J	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.28**	--	--	**28.9**	--	--	**90.0**	--	--
YVD-11	YVD-090918-05	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.05**	--	--	**28.2**	--	--	**90.6**	--	--
YVD-11	YVD-121018-10	12/10/2018	N	884857	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.88**	--	--	**27.4**	--	--	**75.4**	--	--
YVD-11	YVD-031819-18	3/18/2019	N	988273	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.76**	--	--	**26.2**	--	--	**60.4**	--	--
YVD-11	YVD-060219-02	6/2/2019	N	991939	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.60**	--	--	**25.4**	--	--	**58.2**	--	--
YVD-11	YVD-060219-04	6/2/2019	FD	991939	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.68**	--	--	**25.6**	--	--	**58.4**	--	--
YVD-11	YVD-090919-05	9/9/2019	N	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.66**	--	--	**27.2**	--	--	**60.4**	--	--
YVD-11	YVD-120919-13	12/9/2019	N	902276	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.76**	--	--	**29.6**	J	MSD	**57.2**	--	--
YVD-11	YVD-033020-10	3/30/2020	N	006241	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.68**	--	--	**29.8**	--	--	**55.5**	--	--
YVD-11	YVD-061020-31	6/10/2020	N	009361	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.64**	--	--	**31.0**	--	--	**48.8**	--	--
YVD-11	YVD-092120-20	9/21/2020	N	013896	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.70**	--	--	**33.4**	--	--	**60.3**	--	--
YVD-11	YVD-120720-10	12/7/2020	N	017035	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.05**	--	--	**36.4**	--	--	**52.8**	--	--
YVD-11	YVD-030121-06	3/1/2021	N	119931	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.94**	--	--	**37.6**	--	--	**56.0**	--	--
YVD-11	YVD-060821-23	6/8/2021	N	124212	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.80**	--	--	**35.6**	--	--	**36.0**	--	--
YVD-11	YVD-121421-05	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-11	YVD-031522-19	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-11	YVD-060622-18	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-11	YVD-091422-21	9/14/2022	N	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-11	YVD-120622-06	12/6/2022	N	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-11	YVD-030623-21	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-11	YVD-062123-24	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-11	YVD-091123-11	9/11/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-12	YVD-12-130919	09/19/2013	N	SWI0142	--	--	--	--	R	FBK	--	--	--	--	--	--	**0.356**	J+	FBK	--	--	--	**3.14**	--	--	**77.3**	--	--	**245**	--	--
YVD-12	YVD-12-130925	09/25/2013	N	SWI0175	2.00	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-12	YVD-12-131211	12/11/2013	N	SWL0073	2.00	U	--	--	R	MSD, FBK	--	--	--	--	--	--	--	--	--	**0.218**	--	--	**3.63**	--	--	**73.2**	--	--	**262**	--	--
YVD-12	YVD-12-140318	03/18/2014	N	SXC0095	2.00	U	--	**0.564**	--	--	**0.220**	--	--	--	--	--	--	--	--	--	--	--	**3.27**	--	--	**73.4**	--	--	**236**	J--	MSD
YVD-12	YVD-12-140603	06/03/2014	N	SXF0017	0.200	U	--	**0.415**	--	--	**0.280**	J+	FBK	--	--	--	--	--	--	--	--	--	**2.96**	--	--	**70.7**	--	--	**21.3**	J--	MSD
YVD-12	YVD-12-140922	09/22/2014	N	SXI0148	2.00	U	--	**0.669**	--	--	**0.250**	--	--	--	--	--	--	--	--	--	--	--	**3.13**	--	--	**77.9**	--	--	**200**	--	--
YVD-12	YVD-D2-140922	09/22/2014	FD	SXI0148	0.800	U	--	**0.653**	--	--	**0.200**	--	--	--	--	--	--	--	--	--	--	--	**3.00**	--	--	**77.8**	--	--	**200**	--	--
YVD-12	YVD-12-141216	12/16/2014	N	SXL0121	2.00	U	--	0.250	UJ	MSD	**0.250**	--	--	--	--	--	--	--	--	--	--	--	**3.23**	--	--	**71.8**	--	--	**228**	--	--
YVD-12	YVD-12-150317	03/17/2015	N	5904541	2.00	U	--	**0.560**	J--	MSD	**0.310**	--	--	--	--	--	--	--	--	--	--	--	**3.60**	--	--	**73.0**	--	--	**190**	J--	MSD
YVD-12	YVD-12-150617	06/17/2015	N	59010961	2.00	U	--	**0.350**	J--	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.60**	J+	MSD	**83.0**	J+	MSD	**180**	--	--
YVD-12	YVD-12-150924	09/24/2015	N	59020391	2.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.50**	--	--	**73.0**	--	--	**210**	J--	MSD
YVD-12	YVD-12-151216	12/16/2015	N	59025501	2.00	U	--	**0.580**	J--	MSD	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**3.10**	--	--	**74.0**	--	--	**180**	--	--
YVD-12	YVD-12-160309	03/09/2016	N	59029941	2.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.60**	--	--	**73.0**	--	--	**170**	J	DUP
YVD-12	YVD-D3-160309	03/09/2016	FD	59029941	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.50**	--	--	**72.0**	--	--	**180**	J	DUP
YVD-12	YVD-12-160622	6/22/2016	N	59037271	2.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.90**	--	--	**72.0**	--	--	**180**	--	--
YVD-12	YVD-12-160929	9/29/2016	N	K1611704	0.100	U	--	0.500	U	--	--	--	--	**0.026**	--	--	--	--	--	--	--	--	**2.28**	--	--	**67.7**	--	--	**158**	--	--
YVD-12	YVD-12-161213	12/13/2016	N	K1615083	0.100	U	--	0.500	U	--	--	--	--	**0.018**	--	--	--	--	--	--	--	--	**2.29**	--	--	**67.9**	--	--	**150**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-12	YVD-030917-20	3/9/2017	N	K1702404	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.008**	J	--	--	--	--	--	--	--	**2.27**	--	--	**67.4**	--	--	**227**	--	--
YVD-12	YVD-060617-25	6/6/2017	N	K1705833	0.100	U	--	0.500	U	--	--	--	--	**0.010**	J	--	--	--	--	--	--	--	**2.24**	--	--	**66.5**	--	--	**155**	--	--
YVD-12	YVD-092517-15	9/25/2017	N	K1710333	0.100	U	--	0.500	U	--	--	--	--	0.010	U	--	--	--	--	--	--	--	**2.27**	--	--	**64.4**	--	--	**177**	--	--
YVD-12	YVD-120417-03	12/4/2017	N	K1713026	0.100	U	--	0.500	U	--	--	--	--	0.013	U	MBK	--	--	--	--	--	--	**2.06**	--	--	**70.8**	--	--	**169**	--	--
YVD-12	YVD-031918-13	3/19/2018	N	870610	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.30**	--	--	**70.5**	--	--	**167**	--	--
YVD-12	YVD-060318-11	6/3/2018	N	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.58**	--	--	**68.0**	--	--	**171**	--	--
YVD-12	YVD-090918-16	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.52**	--	--	**67.0**	--	--	**180**	--	--
YVD-12	YVD-121018-13	12/10/2018	N	884857	0.050	U	--	10.0	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.52**	--	--	**69.5**	--	--	**170**	--	--
YVD-12	YVD-031719-07	3/17/2019	N	988239	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.46**	--	--	**70.5**	--	--	**188**	--	--
YVD-12	YVD-060319-27	6/3/2019	N	992053	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.40**	--	--	**66.5**	--	--	**188**	--	--
YVD-12	YVD-090919-16	9/9/2019	N	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.48**	--	--	**60.5**	--	--	**172**	--	--
YVD-12	YVD-120919-12	12/9/2019	N	902276	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.48**	--	--	**67.0**	J	MSD	**176**	--	--
YVD-12	YVD-033020-11	3/30/2020	N	006241	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.44**	--	--	**63.0**	--	--	**170**	--	--
YVD-12	YVD-060920-22	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.50**	--	--	**71.5**	--	--	**179**	--	--
YVD-12	YVD-092120-18	9/21/2020	N	013896	0.050	U	--	2.50	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.38**	--	--	**60.5**	--	--	**168**	--	--
YVD-12	YVD-120820-19	12/8/2020	N	017137	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.59**	--	--	**62.0**	--	--	**174**	--	--
YVD-12	YVD-030221-19	3/2/2021	N	120034	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.44**	--	--	**59.5**	--	--	**168**	--	--
YVD-12	YVD-060821-25	6/8/2021	N	124212	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.41**	--	--	**60.0**	--	--	**176**	--	--
YVD-12	YVD-121521-18	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-12	YVD-031522-21	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-12	YVD-060622-20	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-12	YVD-091322-09	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-12	YVD-120822-16	12/8/2022	N	K2214578	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-12	YVD-030523-02	3/5/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-12	YVD-062123-31	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-12	YVD-091123-19	9/11/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-13	YVD-13-130919	09/19/2013	N	SWI0138	2.00	U	--	--	R	FBK	--	--	--	--	--	--	--	R	FBK	--	--	--	**4.30**	--	--	**114**	--	--	**365**	--	--
YVD-13	YVD-13-131211	12/11/2013	N	SWL0073	2.00	U	--	0.200	UJ	MSD	--	--	--	--	--	--	--	--	--	**0.110**	--	--	**4.16**	--	--	**110**	--	--	**278**	--	--
YVD-13	YVD-13-140318	03/18/2014	N	SXC0095	2.00	U	--	**0.613**	--	--	**0.170**	--	--	--	--	--	--	--	--	--	--	--	**4.27**	--	--	**106**	--	--	**312**	J--	MSD
YVD-13	YVD-13-140603	06/03/2014	N	SXF0017	0.800	U	--	**0.727**	--	--	**0.078**	J+	FBK	--	--	--	--	--	--	--	--	--	**3.70**	--	--	**113**	--	--	**151**	J--	MSD
YVD-13	YVD-13-140923	09/23/2014	N	SXI0173	2.00	U	--	**9.13**	J+	MSD	0.050	U	--	--	--	--	--	--	--	--	--	--	**4.40**	--	--	**118**	--	--	**328**	--	--
YVD-13	YVD-13-141217	12/17/2014	N	SXL0121	2.00	U	--	0.250	UJ	MSD	0.100	U	--	--	--	--	--	--	--	--	--	--	**4.74**	--	--	**119**	--	--	**355**	--	--
YVD-13	YVD-13-150317	03/17/2015	N	5904541	2.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.00**	--	--	**120**	--	--	**290**	J--	MSD
YVD-13	YVD-13-150617	06/17/2015	N	59010961	2.00	U	--	**0.680**	J--	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.40**	J+	MSD	**120**	J+	MSD	**310**	--	--
YVD-13	YVD-13-150924	09/24/2015	N	59020391	2.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.10**	--	--	**110**	--	--	**330**	J--	MSD
YVD-13	YVD-13-151216	12/16/2015	N	59025501	2.00	U	--	--	R	MSD	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**4.30**	--	--	**120**	--	--	**310**	--	--
YVD-13	YVD-13-160309	03/09/2016	N	59029941	2.00	U	--	0.250	UJ	FDP, MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.20**	--	--	**120**	--	--	**390**	J	DUP
YVD-13	YVD-13-160622	6/22/2016	N	59037271	2.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.20**	--	--	**120**	--	--	**390**	--	--
YVD-13	YVD-13-160928	9/28/2016	N	K1611698	0.100	U	--	--	R	MSD	--	--	--	**0.014**	--	--	--	--	--	--	--	--	**3.91**	--	--	**113**	--	--	**321**	--	--
YVD-13	YVD-13-161214	12/13/2016	N	K1615083	0.100	U	--	0.500	U	--	--	--	--	**0.047**	--	--	--	--	--	--	--	--	**4.02**	--	--	**111**	--	--	**313**	--	--
YVD-13	YVD-030717-08	3/7/2017	N	K1702324	**0.050**	J	HTQ	0.500	U	--	--	--	--	**0.010**	J	--	--	--	--	--	--	--	**3.63**	--	--	**105**	--	--	**277**	--	--
YVD-13	YVD-030717-10	3/7/2017	FD	K1702324	**0.040**	J	HTQ	0.500	U	--	--	--	--	**0.009**	J	--	--	--	--	--	--	--	**3.71**	--	--	**107**	--	--	**280**	--	--
YVD-13	YVD-060717-33	6/7/2017	N	K1705833	0.100	U	--	0.500	U	--	--	--	--	**0.014**	--	--	--	--	--	--	--	--	**3.83**	--	--	**114**	--	--	**282**	--	--
YVD-13	YVD-092617-25	9/26/2017	N	K1710333	0.100	U	--	0.500	U	--	--	--	--	0.010	U	--	--	--	--	--	--	--	**3.66**	--	--	**105**	--	--	**298**	--	--
YVD-13	YVD-120417-07	12/4/2017	N	K1713026	0.100	U	--	0.500	U	--	--	--	--	0.015	U	MBK	--	--	--	--	--	--	**3.41**	--	--	**102**	--	--	**271**	--	--
YVD-13	YVD-031918-19	3/19/2018	N	870634	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.82**	--	--	**102**	--	--	**249**	--	--
YVD-13	YVD-060318-09	6/3/2018	N	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.01**	--	--	**108**	--	--	**235**	--	--
YVD-13	YVD-090918-14	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.90**	--	--	**104**	--	--	**222**	--	--

Table 8
Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-13	YVD-121018-11	12/10/2018	N	884857	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.95**	--	--	**104**	--	--	**225**	--	--
YVD-13	YVD-031819-15	3/18/2019	N	988273	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.04**	--	--	**105**	--	--	**223**	--	--
YVD-13	YVD-060319-25	6/3/2019	N	992053	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.87**	--	--	**103**	--	--	**201**	--	--
YVD-13	YVD-090919-10	9/9/2019	N	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.95**	--	--	**95.0**	--	--	**197**	--	--
YVD-13	YVD-120919-10	12/9/2019	N	902276	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.90**	--	--	**102**	J	MSD	**191**	--	--
YVD-13	YVD-033020-09	3/30/2020	N	006241	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.92**	--	--	**100**	--	--	**200**	--	--
YVD-13	YVD-060920-21	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.97**	--	--	**106**	--	--	**176**	--	--
YVD-13	YVD-092120-13	9/21/2020	N	013896	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.04**	--	--	**103**	--	--	**198**	--	--
YVD-13	YVD-120820-17	12/8/2020	N	017137	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.16**	--	--	**102**	--	--	**166**	--	--
YVD-13	YVD-030221-15	3/2/2021	N	120034	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.96**	--	--	**101**	--	--	**195**	--	--
YVD-13	YVD-060821-32	6/8/2021	N	124212	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.96**	--	--	**100**	--	--	**196**	--	--
YVD-13	YVD-121521-16	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-13	YVD-031522-20	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-13	YVD-060722-24	6/7/2022	N	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-13	YVD-091322-11	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-13	YVD-122722-18	12/27/2022	N	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-13	YVD-030623-08	3/6/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-13	YVD-030623-09	3/6/2023	FD	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-13	YVD-062023-14	6/20/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-13	YVD-091123-21	9/11/2023	N	K2310209	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-14	YVD-14-130918	09/18/2013	N	SWI0123	2.00	U	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	**3.45**	--	--	**110**	--	--	**213**	--	--
YVD-14	YVD-14-131212	12/12/2013	N	SWL0078	2.00	U	--	0.796	U	ERL	--	--	--	--	--	--	--	--	--	0.060	U	--	**3.29**	--	--	**108**	--	--	**186**	--	--
YVD-14	YVD-14-140319	03/19/2014	N	SXC0107	2.00	U	--	**0.562**	J--	MSD	0.050	U	--	--	--	--	--	--	--	--	--	--	**3.37**	--	--	**102**	--	--	**190**	--	--
YVD-14	YVD-14-140604	06/04/2014	N	SXF0025	2.00	U	--	0.250	UJ	MSD	**0.078**	--	--	--	--	--	--	--	--	--	--	--	**3.46**	--	--	**112**	--	--	**191**	--	--
YVD-14	YVD-14-140924	09/24/2014	N	SXI0173	2.00	U	--	0.250	U	--	**0.087**	J+	FBK	--	--	--	--	--	--	--	--	--	**4.10**	--	--	**124**	--	--	**178**	--	--
YVD-14	YVD-14-141217	12/17/2014	N	SXL0121	2.00	U	--	0.250	UJ	MSD	0.100	U	--	--	--	--	--	--	--	--	--	--	**3.83**	--	--	**113**	--	--	**185**	--	--
YVD-14	YVD-14-150318	03/18/2015	N	5904651	2.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.60**	J--	MSD	**130**	--	--	**180**	--	--
YVD-14R	YVD-14R-151216	12/16/2015	N	59025501	2.00	U	--	--	R	MSD	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**4.40**	--	--	**120**	--	--	**160**	--	--
YVD-14R	YVD-14R-160309	03/09/2016	N	59029941	2.00	U	--	0.250	UJ	FDP, MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.40**	--	--	**130**	--	--	**180**	J	DUP
YVD-14R	YVD-14R-160622	6/22/2016	N	59037271	2.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.30**	--	--	**130**	--	--	**150**	--	--
YVD-14R	YVD-14R-160928	9/28/2016	N	K1611698	0.100	U	--	--	R	MSD	--	--	--	**0.015**	--	--	--	--	--	--	--	--	**4.05**	--	--	**126**	--	--	**140**	--	--
YVD-14R	YVD-14R-161212	12/12/2016	N	K1615029	0.100	UJ	HTQ	0.500	U	--	--	--	--	**0.058**	--	--	--	--	--	--	--	--	**4.09**	--	--	**119**	--	--	**158**	--	--
YVD-14R	YVD-D1-161212	12/12/2016	FD	K1615029	0.100	UJ	HTQ	0.500	U	--	--	--	--	**0.092**	--	--	--	--	--	--	--	--	**4.17**	--	--	**121**	--	--	**155**	--	--
YVD-14R	YVD-030917-19	3/9/2017	N	K1702404	0.100	U	--	0.500	U	--	--	--	--	**0.020**	--	--	--	--	--	--	--	--	**3.80**	--	--	**117**	--	--	**147**	--	--
YVD-14R	YVD-030917-21	3/9/2017	FD	K1702404	0.100	U	--	0.500	U	--	--	--	--	**0.019**	--	--	--	--	--	--	--	--	**3.75**	--	--	**115**	--	--	**151**	--	--
YVD-14R	YVD-060517-06	6/5/2017	N	K1705702	0.100	U	--	0.500	U	--	--	--	--	**0.038**	--	--	--	--	--	--	--	--	**3.53**	--	--	**110**	--	--	**142**	--	--
YVD-14R	YVD-092517-14	9/25/2017	N	K1710333	0.100	U	--	0.500	U	--	--	--	--	**0.018**	--	--	--	--	--	--	--	--	**3.85**	--	--	**121**	--	--	**138**	--	--
YVD-14R	YVD-120417-12	12/4/2017	N	K1713026	0.100	U	--	0.500	U	--	--	--	--	**0.024**	--	--	--	--	--	--	--	--	**3.54**	--	--	**116**	--	--	**124**	--	--
YVD-14R	YVD-031818-11	3/18/2018	N	870610	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.96**	--	--	**127**	--	--	**128**	--	--
YVD-14R	YVD-060318-04	6/3/2018	N	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.18**	--	--	**130**	--	--	**123**	--	--
YVD-14R	YVD-090918-09	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.09**	--	--	**130**	--	--	**125**	--	--
YVD-14R	YVD-121018-02	12/10/2018	N	884857	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.39**	--	--	**131**	--	--	**139**	--	--
YVD-14R	YVD-121018-04	12/10/2018	FD	884857	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.36**	--	--	**131**	--	--	**136**	--	--
YVD-14R	YVD-031819-12	3/18/2019	N	988273	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.56**	--	--	**136**	--	--	**147**	--	--
YVD-14R	YVD-031819-14	3/18/2019	FD	988273	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.57**	--	--	**136**	--	--	**145**	--	--
YVD-14R	YVD-060319-22	6/3/2019	N	992053	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.42**	--	--	**136**	--	--	**145**	--	--
YVD-14R	YVD-060319-24	6/3/2019	FD	992053	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.38**	--	--	**132**	--	--	**131**	--	--
YVD-14R	YVD-090919-13	9/9/2019	N	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.48**	--	--	**129**	--	--	**133**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-14R	YVD-121019-15	12/10/2019	N	902321	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.71**	--	--	**128**	--	--	**123**	--	--
YVD-14R	YVD-121019-17	12/10/2019	FD	902321	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.75**	--	--	**128**	--	--	**124**	--	--
YVD-14R	YVD-033020-02	3/30/2020	N	006241	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.20**	--	--	**134**	--	--	**125**	--	--
YVD-14R	YVD-033020-04	3/30/2020	FD	006241	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.34**	--	--	**134**	--	--	**123**	--	--
YVD-14R	YVD-060920-20	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.44**	--	--	**152**	--	--	**132**	--	--
YVD-14R	YVD-092120-14	9/21/2020	N	013896	0.050	U	--	2.50	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.31**	--	--	**144**	--	--	**124**	--	--
YVD-14R	YVD-120820-20	12/8/2020	N	017137	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.60**	--	--	**144**	--	--	**129**	--	--
YVD-14R	YVD-030121-08	3/1/2021	N	119931	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.59**	--	--	**147**	--	--	**122**	--	--
YVD-14R	YVD-060621-09	6/6/2021	N	124053	0.050	U	--	5.00	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.71**	--	--	**146**	--	--	**114**	--	--
YVD-14R	YVD-121421-08	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-14R	YVD-031422-07	3/14/2022	N	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-14R	YVD-060522-09	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-14R	YVD-091422-15	9/14/2022	N	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-14R	YVD-120822-13	12/8/2022	N	K2214578	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-14R	YVD-120822-14	12/8/2022	FD	K2214578	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-14R	YVD-030523-03	3/5/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-14R	YVD-062123-29	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-14R	YVD-091123-12	9/11/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-15	YVD-15-130917	09/17/2013	N	SWI0123	2.00	U	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	**2.73**	--	--	**127**	--	--	**51.5**	--	--
YVD-15	YVD-15-131212	12/12/2013	N	SWL0078	2.00	U	--	0.200	U	--	--	--	--	--	--	--	--	--	--	**0.238**	--	--	**4.48**	--	--	**114**	--	--	**114**	--	--
YVD-15	YVD-15-140319	03/19/2014	N	SXC0107	2.00	U	--	**0.553**	J--	MSD	**0.220**	--	--	--	--	--	--	--	--	--	--	--	**5.23**	--	--	**93.5**	--	--	**44.7**	--	--
YVD-15	YVD-15-140603	06/03/2014	N	SXF0025	2.00	U	--	**0.475**	J--	MSD	**0.310**	--	--	--	--	--	--	--	--	--	--	--	**5.20**	--	--	**110**	--	--	**39.0**	--	--
YVD-15	YVD-15-140924	09/24/2014	N	SXI0173	2.00	U	--	**1.19**	J+	MSD	**0.072**	J+	FBK	--	--	--	--	--	--	--	--	--	**3.11**	--	--	**135**	--	--	**50.7**	--	--
YVD-15	YVD-15-141217	12/17/2014	N	SXL0121	2.00	U	--	**0.414**	J--	MSD	**0.170**	--	--	--	--	--	--	--	--	--	--	--	**3.67**	--	--	**60.3**	--	--	**53.4**	--	--
YVD-15	YVD-15-150317	03/17/2015	N	5904651	2.00	U	--	0.250	UJ	MSD	**0.270**	--	--	--	--	--	--	--	--	--	--	--	**8.40**	J--	MSD	**160**	--	--	**53.0**	--	--
YVD-15	YVD-15-150617	06/17/2015	N	59011021	0.200	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.60**	J	RPD	**110**	J	RPD	**59.0**	--	--
YVD-15	YVD-15-150925	09/25/2015	N	59020431	2.00	U	--	2.50	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.90**	--	--	**80.0**	--	--	**47.0**	--	--
YVD-15	YVD-15-151215	12/15/2015	N	59025431	2.00	U	--	--	R	MSD	0.250	UJ	FDP	--	--	--	--	--	--	--	--	--	**4.10**	--	--	**80.0**	--	--	**40.0**	--	--
YVD-15	YVD-15-160309	03/09/2016	N	59029711	2.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.20**	--	--	**75.0**	--	--	**65.0**	J+	MSD
YVD-15	YVD-15-160621	6/21/2016	N	59037271	2.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.50**	--	--	**74.0**	--	--	**86.0**	--	--
YVD-15	YVD-15-160928	9/28/2016	N	K1611629	0.100	U	--	0.500	U	--	--	--	--	**0.023**	--	--	--	--	--	--	--	--	**3.15**	--	--	**66.2**	--	--	**108**	--	--
YVD-15	YVD-15-161215	12/15/2016	N	K1615126	0.100	U	--	0.500	U	--	--	--	--	**0.095**	--	--	--	--	--	--	--	--	**3.40**	--	--	**59.1**	--	--	**108**	--	--
YVD-15	YVD-030917-23	3/9/2017	N	K1702404	0.100	U	--	0.500	U	--	--	--	--	**0.011**	--	--	--	--	--	--	--	--	**2.95**	--	--	**55.3**	--	--	**125**	--	--
YVD-15	YVD-060617-20	6/6/2017	N	K1705754	0.100	U	--	0.500	U	--	--	--	--	**0.017**	--	--	--	--	--	--	--	--	**2.98**	--	--	**62.9**	--	--	**143**	--	--
YVD-15	YVD-092517-10	9/25/2017	N	K1710333	0.100	U	--	0.500	U	--	--	--	--	0.010	U	--	--	--	--	--	--	--	**3.21**	--	--	**74.5**	--	--	**167**	--	--
YVD-15	YVD-120517-28	12/5/2017	N	K1713091	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.013**	--	--	--	--	--	--	--	--	**2.89**	--	--	**78.6**	--	--	**145**	--	--
YVD-15	YVD-031818-09	3/18/2018	N	870610	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.25**	--	--	**94.5**	--	--	**129**	--	--
YVD-15	YVD-060318-08	6/3/2018	N	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.36**	--	--	**97.5**	--	--	**118**	--	--
YVD-15	YVD-090918-11	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.18**	--	--	**99.0**	--	--	**110**	--	--
YVD-15	YVD-121018-06	12/10/2018	N	884857	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.25**	--	--	**97.5**	--	--	**111**	--	--
YVD-15	YVD-031719-10	3/17/2019	N	988239	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.22**	--	--	**96.0**	--	--	**110**	--	--
YVD-15	YVD-060419-29	6/4/2019	N	992242	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.18**	--	--	**100**	--	--	**114**	--	--
YVD-15	YVD-090919-11	9/9/2019	N	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.14**	--	--	**92.0**	--	--	**103**	--	--
YVD-15	YVD-121019-19	12/10/2019	N	902321	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.40**	--	--	**91.5**	--	--	**96.9**	--	--
YVD-15	YVD-033020-06	3/30/2020	N	006241	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.12**	--	--	**90.0**	--	--	**90.9**	--	--
YVD-15	YVD-060920-16	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.08**	--	--	**96.0**	--	--	**87.7**	--	--
YVD-15	YVD-092020-09	9/20/2020	N	013864	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.12**	--	--	**89.5**	--	--	**90.0**	--	--
YVD-15	YVD-120720-14	12/7/2020	N	017035	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.35**	--	--	**89.0**	--	--	**89.0**	--	--
YVD-15	YVD-030121-14	3/1/2021	N	119931	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.15**	--	--	**85.5**	--	--	**86.9**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-15	YVD-060621-08	6/6/2021	N	124053	0.050	U	--	5.00	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.32**	--	--	**86.5**	--	--	**72.0**	--	--
YVD-15	YVD-121421-07	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-15	YVD-031422-05	3/14/2022	N	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-15	YVD-060522-07	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-15	YVD-091422-19	9/14/2022	N	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-15	YVD-120622-07	12/6/2022	N	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-15	YVD-030523-04	3/5/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-15	YVD-062123-25	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-15	YVD-091123-20	9/11/2023	N	K2310209	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-16	YVD-16-130923	09/23/2013	N	SWI0178	--	--	--	**0.375**	--	--	--	--	--	--	--	--	0.100	U	--	--	--	--	**6.16**	--	--	**81.7**	--	--	--	--	--
YVD-16	YVD-16-130926	09/26/2013	N	SWI0190	2.00	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**140**	--	--
YVD-16	YVD-16-131212	12/12/2013	N	SWL0073	2.00	U	--	0.200	UJ	MSD	--	--	--	--	--	--	--	--	--	0.060	U	--	**5.25**	--	--	**79.8**	--	--	**163**	--	--
YVD-16	YVD-16-140318	03/18/2014	N	SXC0107	2.00	U	--	**1.01**	J--	MSD	**1.40**	--	--	--	--	--	--	--	--	--	--	--	**15.0**	--	--	**75.5**	--	--	**130**	--	--
YVD-16	YVD-16-140603	06/03/2014	N	SXF0017	0.800	U	--	**0.741**	--	--	**0.830**	--	--	--	--	--	--	--	--	--	--	--	**8.47**	--	--	**78.4**	--	--	**131**	J--	MSD
YVD-16	YVD-16-140923	09/23/2014	N	SXI0173	1.00	U	--	**0.747**	J+	MSD	**0.220**	--	--	--	--	--	--	--	--	--	--	--	**7.48**	--	--	**94.1**	--	--	**114**	--	--
YVD-16	YVD-16-141217	12/17/2014	N	SXL0121	1.00	U	--	0.250	UJ	MSD	**0.250**	J	FDP	--	--	--	--	--	--	--	--	--	**6.77**	--	--	**83.7**	--	--	**118**	--	--
YVD-16	YVD-D3-141217	12/17/2014	FD	SXL0121	0.200	U	--	**0.290**	J--	MSD	**0.100**	J	FDP	--	--	--	--	--	--	--	--	--	**6.27**	--	--	**81.7**	--	--	**130**	--	--
YVD-16	YVD-16-150317	03/17/2015	N	5904651	1.00	U	--	**0.290**	J--	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**6.10**	J--	MSD	**87.0**	--	--	**120**	--	--
YVD-16	YVD-16-150616	06/16/2015	N	59010961	1.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**6.20**	J+	MSD	**91.0**	J+	MSD	**120**	--	--
YVD-16	YVD-16-150923	09/23/2015	N	59020281	1.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**6.50**	--	--	**85.0**	--	--	**130**	--	--
YVD-16	YVD-16-151215	12/15/2015	N	59025431	1.00	U	--	--	R	MSD	0.250	UJ	FDP	--	--	--	--	--	--	--	--	--	**5.70**	--	--	**85.0**	--	--	**120**	--	--
YVD-16	YVD-16-160309	03/09/2016	N	59029711	1.00	U	--	--	R	MSD	**0.270**	--	--	--	--	--	--	--	--	--	--	--	**7.40**	--	--	**86.0**	--	--	**130**	J+	MSD
YVD-16	YVD-16-160621	6/21/2016	N	59037151	1.00	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**5.90**	--	--	**86.0**	--	--	**120**	--	--
YVD-16	YVD-D2-160621	6/21/2016	FD	59037151	0.200	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**6.00**	--	--	**88.0**	--	--	**120**	--	--
YVD-16	YVD-16-160928	9/28/2016	N	K1611629	0.100	U	--	0.500	U	--	--	--	--	**0.016**	--	--	--	--	--	--	--	--	**5.69**	--	--	**90.2**	--	--	**110**	--	--
YVD-16	YVD-16-161215	12/15/2016	N	K1615126	0.100	U	--	0.500	U	--	--	--	--	**0.068**	--	--	--	--	--	--	--	--	**5.59**	--	--	**82.5**	--	--	**112**	--	--
YVD-16	YVD-030917-22	3/9/2017	N	K1702404	0.100	U	--	0.500	U	--	--	--	--	**0.045**	--	--	--	--	--	--	--	--	**5.16**	--	--	**79.8**	--	--	**113**	--	--
YVD-16	YVD-060517-12	6/5/2017	N	K1705754	0.100	U	--	0.500	U	--	--	--	--	**0.021**	--	--	--	--	--	--	--	--	**5.08**	--	--	**83.0**	--	--	**117**	--	--
YVD-16	YVD-092617-28	9/26/2017	N	K1710381	0.100	U	--	0.500	U	--	--	--	--	**0.016**	--	--	--	--	--	--	--	--	**5.44**	--	--	**84.1**	--	--	**115**	--	--
YVD-16	YVD-120517-22	12/5/2017	N	K1713091	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.048**	--	--	--	--	--	--	--	--	**5.17**	--	--	**80.1**	--	--	**110**	--	--
YVD-16	YVD-031918-16	3/19/2018	N	870634	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.25**	--	--	**79.0**	--	--	**106**	--	--
YVD-16	YVD-060318-10	6/3/2018	N	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.55**	--	--	**88.0**	--	--	**104**	--	--
YVD-16	YVD-090918-07	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.20**	--	--	**83.5**	--	--	**107**	--	--
YVD-16	YVD-121118-20	12/11/2018	N	884939	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.85**	--	--	**84.0**	--	--	**106**	--	--
YVD-16	YVD-031719-08	3/17/2019	N	988239	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.45**	--	--	**82.0**	--	--	**109**	--	--
YVD-16	YVD-060219-06	6/2/2019	N	991939	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.45**	--	--	**80.5**	--	--	**106**	--	--
YVD-16	YVD-090919-07	9/9/2019	N	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.30**	--	--	**77.0**	--	--	**107**	--	--
YVD-16	YVD-120919-11	12/9/2019	N	902276	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.35**	--	--	**79.5**	J	MSD	**106**	--	--
YVD-16	YVD-033120-16	3/31/2020	N	006260	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.35**	--	--	**82.0**	--	--	**107**	--	--
YVD-16	YVD-061020-30	6/10/2020	N	009361	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.20**	--	--	**79.0**	--	--	**106**	--	--
YVD-16	YVD-092020-06	9/20/2020	N	013864	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.45**	--	--	**81.0**	--	--	**112**	--	--
YVD-16	YVD-120720-08	12/7/2020	N	017035	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.95**	--	--	**84.0**	--	--	**112**	--	--
YVD-16	YVD-030121-02	3/1/2021	N	119931	0.050	U	--	2.50	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.25**	--	--	**78.0**	--	--	**113**	--	--
YVD-16	YVD-030121-04	3/1/2021	FD	119931	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.50**	--	--	**79.5**	--	--	**115**	--	--
YVD-16	YVD-060621-03	6/6/2021	N	124053	0.050	U	--	5.00	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.03**	--	--	**77.5**	--	--	**111**	--	--
YVD-16	YVD-121421-02	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-16	YVD-121421-03	12/14/2021	FD	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-16	YVD-031522-17	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-16	YVD-060622-16	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-16	YVD-091322-08	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-16	YVD-120622-05	12/6/2022	N	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-16	YVD-030523-05	3/5/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-16	YVD-030523-06	3/5/2023	FD	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-16	YVD-062023-13	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-16	YVD-091123-17	9/11/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-17	YVD-17-130919	09/19/2013	N	SWI0142	--	--	--	2.50	U	--	--	--	--	--	--	--	**3.64**	--	--	--	--	--	**8.32**	--	--	**12.2**	--	--	**6.48**	--	--
YVD-17	YVD-17-130924	09/24/2013	N	SWI0175	0.200	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-17	YVD-17-131210	12/10/2013	N	SWL0055	0.200	U	--	--	R	FBK, MSD	--	--	--	--	--	--	--	--	--	**1.61**	--	--	**5.25**	--	--	**7.89**	--	--	**6.64**	--	--
YVD-17	YVD-17-140316	03/16/2014	N	SXC0081	0.200	U	--	0.250	U	--	**0.300**	--	--	--	--	--	--	--	--	--	--	--	**1.73**	--	--	**6.09**	--	--	**6.42**	--	--
YVD-17	YVD-17-140601	06/01/2014	N	SXF0008	0.200	U	--	**0.287**	--	--	**0.520**	--	--	--	--	--	--	--	--	--	--	--	**2.22**	--	--	**8.71**	--	--	**5.74**	--	--
YVD-17	YVD-17-140922	09/22/2014	N	SXI0148	0.200	U	--	**0.293**	--	--	**0.360**	--	--	--	--	--	--	--	--	--	--	--	**2.91**	--	--	**9.92**	--	--	**5.08**	--	--
YVD-17	YVD-17-141215	12/15/2014	N	SXL0103	0.200	U	--	0.250	U	--	**0.190**	--	--	--	--	--	--	--	--	--	--	--	**1.84**	--	--	**9.15**	--	--	**6.01**	J+	MSD, DUP
YVD-17	YVD-17-150316	03/16/2015	N	5904471	0.200	U	--	0.250	UJ	MSD	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**1.40**	--	--	**6.30**	--	--	**5.70**	--	--
YVD-17	YVD-D1-150316	03/16/2015	FD	5904471	0.200	U	--	0.250	UJ	MSD	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**1.50**	--	--	**6.20**	--	--	**5.70**	--	--
YVD-17	YVD-17-150617	06/17/2015	N	59010961	0.200	U	--	0.250	UJ	MSD	**0.250**	--	--	--	--	--	--	--	--	--	--	--	**1.80**	J+	MSD	**8.70**	J+	MSD	**5.40**	--	--
YVD-17	YVD-17-150924	09/24/2015	N	59020391	**1.20**	--	--	0.250	UJ	MSD	**0.260**	--	--	--	--	--	--	--	--	--	--	--	**2.00**	--	--	**9.00**	--	--	**5.60**	J--	MSD
YVD-17	YVD-17-151216	12/16/2015	N	59025501	0.200	U	--	--	R	MSD	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**1.40**	--	--	**8.00**	--	--	**5.40**	--	--
YVD-17	YVD-17-160310	03/10/2016	N	59029941	0.200	U	--	0.250	UJ	FDP	0.250	U	--	--	--	--	--	--	--	--	--	--	**1.20**	--	--	**6.40**	--	--	**4.80**	J	DUP
YVD-17	YVD-17-160623	6/23/2016	N	59037371	0.200	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**1.60**	--	--	**8.30**	--	--	**5.30**	--	--
YVD-17	YVD-17-160926	9/26/2016	N	K1611565	0.100	U	--	--	R	MSD	--	--	--	**0.095**	--	--	--	--	--	--	--	--	**1.59**	--	--	**8.30**	--	--	**7.90**	--	--
YVD-17	YVD-17-161215	12/15/2016	N	K1615174	0.100	U	--	0.500	U	--	--	--	--	**0.103**	--	--	--	--	--	--	--	--	**1.46**	--	--	**7.44**	--	--	**6.00**	--	--
YVD-17	YVD-031017-29	3/10/2017	N	K1702448	0.100	U	--	0.500	U	--	--	--	--	**0.038**	--	--	--	--	--	--	--	--	**0.260**	--	--	**5.39**	--	--	**6.26**	--	--
YVD-17	YVD-060617-24	6/6/2017	N	K1705754	0.100	U	--	0.500	U	--	--	--	--	**0.055**	--	--	--	--	--	--	--	--	**1.16**	--	--	**7.81**	--	--	**6.02**	--	--
YVD-17	YVD-092517-08	9/25/2017	N	K1710274	0.100	U	--	0.500	U	--	--	--	--	**0.046**	--	--	--	--	--	--	--	--	**1.73**	--	--	**9.50**	--	--	**7.17**	--	--
YVD-17	YVD-120517-26	12/5/2017	N	K1713091	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.036**	--	--	--	--	--	--	--	--	**1.55**	--	--	**9.87**	--	--	**7.53**	--	--
YVD-17	YVD-060418-20	6/4/2018	N	874662	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**0.780**	--	--	**7.20**	--	--	**6.54**	--	--
YVD-17	YVD-060219-12	6/2/2019	N	991939	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	**5.95**	--	--	**3.50**	--	--
YVD-17	YVD-060820-10	6/8/2020	N	009144	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	**6.20**	--	--	**6.06**	--	--
YVD-17	YVD-060621-04	6/6/2021	N	124053	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	**5.75**	--	--	**5.44**	--	--
YVD-17	YVD-060621-05	6/6/2021	FD	124053	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	**5.75**	--	--	**5.31**	--	--
YVD-17	YVD-060622-14	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-17	YVD-062023-15	6/20/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-18	YVD-18-130919	09/19/2013	N	SWI0142	--	--	--	--	R	FBK	--	--	--	--	--	--	0.100	U	--	--	--	--	**3.22**	--	--	**78.3**	--	--	**122**	--	--
YVD-18	YVD-18-130925	09/25/2013	N	SWI0175	2.00	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-18	YVD-18-131211	12/11/2013	N	SWL0073	2.00	U	--	1.50	UJ	MSD	--	--	--	--	--	--	--	--	--	0.060	U	--	**3.02**	--	--	**71.3**	--	--	**116**	--	--
YVD-18	YVD-D2-131211	12/11/2013	FD	SWL0073	2.00	U	--	0.200	UJ	MSD	--	--	--	--	--	--	--	--	--	0.060	U	--	**3.06**	--	--	**70.9**	--	--	**129**	--	--
YVD-18	YVD-18-140318	03/18/2014	N	SXC0095	2.00	U	--	**0.358**	--	--	**0.068**	--	--	--	--	--	--	--	--	--	--	--	**3.30**	--	--	**77.5**	--	--	**147**	J--	MSD
YVD-18	YVD-D2-140318	03/18/2014	FD	SXC0095	2.00	U	--	**0.342**	--	--	**0.082**	--	--	--	--	--	--	--	--	--	--	--	**3.26**	--	--	**78.0**	--	--	**140**	J--	MSD
YVD-18	YVD-18-140603	06/03/2014	N	SXF0017	0.800	U	--	**0.796**	--	--	**0.071**	J+	FBK	--	--	--	--	--	--	--	--	--	**3.24**	--	--	**77.7**	--	--	**135**	J--	MSD
YVD-18	YVD-18-140923	09/23/2014	N	SXI0173	1.00	U	--	**0.335**	J+	MSD	**0.086**	--	--	--	--	--	--	--	--	--	--	--	**3.80**	--	--	**81.6**	--	--	**111**	--	--
YVD-18	YVD-18-141216	12/16/2014	N	SXL0121	1.00	U	--	0.250	UJ	MSD	0.100	U	--	--	--	--	--	--	--	--	--	--	**3.63**	--	--	**81.8**	--	--	**131**	--	--
YVD-18	YVD-18-150317	03/17/2015	N	5904541	1.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.50**	--	--	**87.0**	--	--	**140**	J--	MSD
YVD-18	YVD-18-150617	06/17/2015	N	59010961	1.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.10**	J+	MSD	**86.0**	J+	MSD	**120**	--	--
YVD-18	YVD-18-150924	09/24/2015	N	59020391	1.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.50**	--	--	**77.0**	--	--	**140**	J--	MSD
YVD-18	YVD-18-151216	12/16/2015	N	59025501	1.00	U	--	--	R	MSD	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**4.00**	--	--	**91.0**	--	--	**150**	--	--

Table 8
Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-18	YVD-18-160309	03/09/2016	N	59029941	1.00	U	--	0.250	UJ	FDP, MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.80**	--	--	**89.0**	--	--	**150**	J	DUP
YVD-18	YVD-18-160622	6/22/2016	N	59037271	1.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.70**	--	--	**86.0**	--	--	**140**	--	--
YVD-18	YVD-18-160928	9/28/2016	N	K1611629	0.100	U	--	0.500	U	--	--	--	--	**0.013**	--	--	--	--	--	--	--	--	**3.75**	--	--	**83.8**	--	--	**135**	--	--
YVD-18	YVD-18-161214	12/14/2016	N	K1615083	0.100	U	--	0.500	U	--	--	--	--	**0.043**	--	--	--	--	--	--	--	--	**3.69**	--	--	**82.5**	--	--	**139**	--	--
YVD-18	YVD-D3-161214	12/14/2016	FD	K1615083	0.100	U	--	0.500	U	--	--	--	--	**0.019**	--	--	--	--	--	--	--	--	**3.82**	--	--	**84.0**	--	--	**142**	--	--
YVD-18	YVD-030617-05	3/6/2017	N	K1702324	**0.040**	J	HTQ	0.500	U	--	--	--	--	**0.024**	--	--	--	--	--	--	--	--	**3.39**	--	--	**78.8**	--	--	**140**	--	--
YVD-18	YVD-060717-31	6/7/2017	N	K1705833	0.100	U	--	0.500	U	--	--	--	--	**0.018**	--	--	--	--	--	--	--	--	**3.82**	--	--	**81.8**	--	--	**135**	--	--
YVD-18	YVD-092617-27	9/26/2017	N	K1710333	0.100	U	--	0.500	U	--	--	--	--	**0.018**	--	--	--	--	--	--	--	--	**3.64**	--	--	**77.0**	--	--	**137**	--	--
YVD-18	YVD-120417-05	12/4/2017	N	K1713026	0.100	U	--	0.500	U	--	--	--	--	0.017	U	MBK	--	--	--	--	--	--	**3.62**	--	--	**81.6**	--	--	**144**	--	--
YVD-18	YVD-031918-17	3/19/2018	N	870634	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.78**	--	--	**83.0**	--	--	**161**	--	--
YVD-18	YVD-060318-07	6/3/2018	N	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.18**	--	--	**88.5**	--	--	**147**	--	--
YVD-18	YVD-090918-12	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.20**	--	--	**78.0**	--	--	**127**	--	--
YVD-18	YVD-121018-09	12/10/2018	N	884857	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.10**	--	--	**87.0**	--	--	**145**	--	--
YVD-18	YVD-031819-13	3/18/2019	N	988273	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.22**	--	--	**88.0**	--	--	**171**	--	--
YVD-18	YVD-060319-23	6/3/2019	N	992053	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.09**	--	--	**86.0**	--	--	**161**	--	--
YVD-18	YVD-090919-06	9/9/2019	N	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.08**	--	--	**76.5**	--	--	**130**	--	--
YVD-18	YVD-090919-08	9/9/2019	FD	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.09**	--	--	**77.0**	--	--	**130**	--	--
YVD-18	YVD-120919-08	12/9/2019	N	902276	0.050	U		0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U		**4.18**			**86.0**	J	MSD	**157**		
YVD-18	YVD-033020-07	3/30/2020	N	006241	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.04**	--	--	**87.5**	--	--	**170**	--	--
YVD-18	YVD-060920-19	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.98**	--	--	**89.0**	--	--	**155**	--	--
YVD-18	YVD-092120-15	9/21/2020	N	013896	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.03**	--	--	**83.0**	--	--	**145**	--	--
YVD-18	YVD-092120-17	9/21/2020	FD	013896	0.050	U	--	2.50	UJ	MSD	--	--	--	--	--	--	--	--	--	**0.070**	--	--	**4.00**	--	--	**83.0**	--	--	**144**	--	--
YVD-18	YVD-120820-15	12/8/2020	N	017137	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.11**	--	--	**88.0**	--	--	**164**	--	--
YVD-18	YVD-030221-17	3/2/2021	N	120034	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.02**	--	--	**87.0**	--	--	**169**	--	--
YVD-18	YVD-060821-30	6/8/2021	N	124212	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.02**	--	--	**85.5**	--	--	**161**	--	--
YVD-18	YVD-121521-12	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-18	YVD-121521-14	12/15/2021	FD	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-18	YVD-031522-18	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-18	YVD-060722-25	6/7/2022	N	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-18	YVD-060722-26	6/7/2022	FD	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-18	YVD-091322-13	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-18	YVD-122722-16	12/27/2022	N	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-18	YVD-122722-17	12/27/2022	FD	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-18	YVD-030623-11	3/6/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-18	YVD-062023-16	6/20/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-18	YVD-091123-23	9/11/2023	N	K2310209	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Equipment Blank	YVD-EB-130918	09/18/2013	EB	SWI0123	0.200	U	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Equipment Blank	YVD-EB-130925	09/25/2013	EB	SWI0175	0.200	U	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Equipment Blank	YVD-EB-131212	12/12/2013	EB	SWL0078	0.200	U	--	0.200	U	--	--	--	--	--	--	--	--	--	--	0.060	U	--	1.00	U	--	0.500	U	--	0.500	U	--
Equipment Blank	YVD-EB-140317	03/17/2014	EB	SXC0081	0.200	U	--	0.250	U	--	--	--	--	0.05	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Equipment Blank	YVD-EB-140318	03/18/2014	EB	SXC0095	0.200	U	--	0.250	U	--	--	--	--	**0.05**	--	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Equipment Blank	YVD-EB-140319	03/19/2014	EB	SXC0107	0.200	U	--	0.250	U	--	--	--	--	0.05	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Equipment Blank	YVD-EB-140604	06/04/2014	EB	SXF0025	0.200	U	--	0.250	U	--	--	--	--	0.05	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	**1.24**	--	--

Table 8
Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
Equipment Blank	YVD-EB-140924	09/24/2014	EB	SXI0173	0.200	U	--	**1.20**	--	--	--	--	--	**0.062**	--	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Equipment Blank	YVD-EB-141217	12/17/2014	EB	SXL0144	0.200	U	--	0.250	U	--	--	--	--	0.1	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Equipment Blank	YVD-EB-150617	06/17/2015	EB	59011021	0.200	U	--	**0.370**	--	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Equipment Blank	YVD-EB-150925	09/25/2015	EB	59020431	0.200	U	--	**0.380**	--	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Equipment Blank	YVD-EB-151216	12/16/2015	EB	59025501	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Equipment Blank	YVD-EB-160310	03/10/2016	EB	59029941	0.200	U	--	**1.90**	--	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	**1.10**	--	--	0.500	U	--
Equipment Blank	YVD-EB-160623	6/23/2016	EB	59037371	0.200	U	--	**0.430**	--	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Equipment Blank	YVD-EB-160926	9/26/2016	EB	K1611506	0.100	U	--	--	R	MSD	--	--	--	0.01	U	--	--	--	--	--	--	--	**0.100**	J	--	**0.130**	J	--	0.200	U	--
Equipment Blank	YVD-EB-160927	9/27/2016	EB	K1611629	0.050	UJ	HTQ	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.200	U	--	**0.040**	J	--	**0.080**	J	--
Equipment Blank	YVD-EB-160928	9/28/2016	EB	K1611629	0.050	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.200	U	--	**0.040**	J	--	**0.510**	--	--
Equipment Blank	YVD-EB1-161214	12/14/2016	EB	K1615083	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	--	0.200	U	--
Equipment Blank	YVD-EB2-161215	12/15/2016	EB	K1615126	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	MBK	0.200	U	--
Equipment Blank	YVD-EB3-161216	12/16/2016	EB	K1615174	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	MBK	**0.400**	--	--
Field Blank	YVD-F1-130916	09/16/2013	FB	SWI0113	0.200	U	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	1.00	U	--	0.500	U	--	**0.530**	--	--
Field Blank	YVD-F2-130917	09/17/2013	FB	SWI0113	0.200	U	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	1.00	U	--	0.500	U	--	**0.510**	--	--
Field Blank	YVD-F3-130918	09/18/2013	FB	SWI0123	0.200	U	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F4-130918	09/18/2013	FB	SWI0138	0.200	U	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F5-130919	09/19/2013	FB	SWI0142	--	--	--	**0.373**	--	--	--	--	--	--	--	--	**0.243**	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F6-130923	09/23/2013	FB	SWI0178	--	--	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	1.00	U	--	0.500	U	--	--	--	--
Field Blank	YVD-F7-130924	09/24/2013	FB	SWI0175	0.200	U	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F7-130926	09/26/2013	FB	SWI0190	0.200	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.500	U	--
Field Blank	YVD-F1-131209	12/09/2013	FB	SWL0055	0.200	U	--	**0.330**	--	--	--	--	--	--	--	--	--	--	--	0.06	U	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F2-131210	12/10/2013	FB	SWL0063	0.200	U	--	**3.70**	--	--	--	--	--	--	--	--	--	--	--	0.06	U	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F3-131211	12/11/2013	FB	SWL0073	0.200	U	--	**0.430**	--	--	--	--	--	--	--	--	--	--	--	0.06	U	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F4-131212	12/12/2013	FB	SWL0078	0.200	U	--	0.200	U	--	--	--	--	--	--	--	--	--	--	0.06	U	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F1-140316	03/16/2014	FB	SXC0081	0.200	U	--	0.250	U	--	--	--	--	0.05	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F2-140317	03/17/2014	FB	SXC0095	0.200	U	--	0.250	U	--	--	--	--	0.05	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F3-140318	03/18/2014	FB	SXC0107	0.200	U	--	0.250	U	--	--	--	--	0.05	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F4-140319	03/19/2014	FB	SXC0107	0.200	U	--	0.250	U	--	--	--	--	0.05	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F1-140601	06/01/2014	FB	SXF0008	0.200	U	--	0.250	U	--	--	--	--	0.05	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F2-140602	06/02/2014	FB	SXF0017	0.200	U	--	0.250	U	--	--	--	--	**0.061**	--	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F3-140603	06/03/2014	FB	SXF0025	0.200	U	--	0.250	U	--	--	--	--	0.05	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F1-140921	09/21/2014	FB	SXI0148	0.200	U	--	0.250	U	--	--	--	--	0.05	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F2-140922	09/22/2014	FB	SXI0148	0.200	U	--	0.250	U	--	--	--	--	0.05	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F3-140923	09/23/2014	FB	SXI0158	0.200	U	--	0.250	U	--	--	--	--	0.05	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F4-140924	09/24/2014	FB	SXI0173	0.200	U	--	0.250	U	--	--	--	--	**0.054**	--	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F1-141215	12/15/2014	FB	SXL0103	0.200	U	--	0.250	U	--	--	--	--	0.1	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	UJ	DUP
Field Blank	YVD-F2-141215	12/15/2014	FB	SXL0108	0.200	U	--	0.250	U	--	--	--	--	0.1	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F3-141216	12/16/2014	FB	SXL0121	0.200	U	--	0.250	U	--	--	--	--	0.1	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F4-141217	12/17/2014	FB	SXL0144	--	R	HTQ	0.250	U	--	--	--	--	0.1	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
Field Blank	YVD-F1-150315	03/15/2015	FB	5904471	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F2-150316	03/16/2015	FB	5904541	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F3-150317	03/17/2015	FB	5904651	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F1-150615	06/15/2015	FB	59010751	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F2-150616	06/16/2015	FB	59010961	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F3-150617	06/17/2015	FB	59011021	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F1-150922	09/22/2015	FB	59020141	0.200	U	--	**0.260**	--	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F2-150923	09/23/2015	FB	59020281	0.200	U	--	0.250	U	--	--	--	--	**0.26**	--	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F3-150923	09/23/2015	FB	59020391	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F4-150924	09/24/2015	FB	59020391	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F5-150925	09/25/2015	FB	59020431	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F1-151213	12/13/2015	FB	59025351	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F2-151214	12/14/2015	FB	59025431	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F3-151215	12/15/2015	FB	59025501	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F4-151216	12/16/2015	FB	59025501	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F1-160307	03/07/2016	FB	59029521	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F2-160308	03/08/2016	FB	59029711	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F3-160309	03/09/2016	FB	59029941	0.200	U	--	**0.300**	--	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F4-160310	03/10/2016	FB	59029941	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F1-160620	6/20/2016	FB	59037101	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F2-160621	6/21/2016	FB	59037151	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F3-160622	6/22/2016	FB	59037271	0.200	U	--	**0.360**	--	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F4-160623	6/23/2016	FB	59037371	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-FB-160926	9/26/2016	FB	K1611506	0.100	U	--	--	R	MSD	--	--	--	0.01	U	--	--	--	--	--	--	--	**0.080**	J	--	**0.030**	J	--	0.200	U	--
Field Blank	YVD-FB-160927	9/27/2016	FB	K1611565	0.100	U	--	--	R	MSD	--	--	--	0.01	U	--	--	--	--	--	--	--	0.200	U	--	0.200	U	--	0.200	U	--
Field Blank	YVD-FB-160928	9/28/2016	FB	K1611629	0.050	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.200	U	--	**0.050**	J	--	**3.61**	--	--
Field Blank	YVD-FB-160929	9/29/2016	FB	K1611698	0.100	U	--	--	R	MSD	--	--	--	0.01	U	--	--	--	--	--	--	--	0.200	U	--	**0.050**	J	--	0.200	U	--
Field Blank	YVD-FB1-161212	12/12/2016	FB	K1615029	0.100	UJ	HTQ	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	MBK	0.200	U	MBK
Field Blank	YVD-FB2-161213	12/13/2016	FB	K1615045	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	MBK	0.200	U	--
Field Blank	YVD-FB3-161214	12/14/2016	FB	K1615083	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	MBK	**0.350**	--	--
Field Blank	YVD-FB4-161215	12/15/2016	FB	K1615126	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	MBK	0.200	U	--
Field Blank	YVD-FB5-161216	12/16/2016	FB	K1615174	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	MBK	0.200	U	--
Field Blank	YVD-030617-01	3/6/2017	FB	K1702228	0.100	U	--	**0.200**	J	--	--	--	--	0.01	U	--	--	--	--	--	--	--	**0.080**	J	--	**0.040**	J	--	0.200	U	--
Field Blank	YVD-030717-06	3/7/2017	FB	K1702324	0.100	UJ	HTQ	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	--	0.200	U	--
Field Blank	YVD-030817-11	3/8/2017	FB	K1702324	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	--	0.030	J	--
Field Blank	YVD-030917-17	3/9/2017	FB	K1702404	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	--	0.200	U	--
Field Blank	YVD-031017-26	3/10/2017	FB	K1702448	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	--	0.260	--	--
Field Blank	YVD-031317-30	3/13/2017	FB	K1702489	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	--	0.200	U	--
Field Blank	YVD-060417-01	6/4/2017	FB	K1705702	21.0	U	--	**0.700**	--	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.021	U	--	**0.110**	J	--	5.30	U	--
Field Blank	YVD-060517-07	6/5/2017	FB	K1705702	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	**0.060**	J	--	**0.110**	J	--	**0.250**	--	--
Field Blank	YVD-060617-17	6/6/2017	FB	K1705754	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	--	0.200	U	--
Field Blank	YVD-060717-28	6/7/2017	FB	K1705833	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	**0.020**	J	--	0.200	U	--
Field Blank	YVD-092517-01	9/25/2017	FB	K1710274	0.100	U	--	0.500	U	--	--	--	--	0.010	U	--	--	--	--	--	--	--	0.210	U	MBK	0.210	U	MBK	0.200	U	--
Field Blank	YVD-092617-16	9/26/2017	FB	K1710333	0.100	U	--	0.500	U	--	--	--	--	0.010	U	--	--	--	--	--	--	--	**0.090**	J	--	0.210	U	MBK	**0.860**	--	--
Field Blank	YVD-120417-01	12/4/2017	FB	K1713026	0.100	U	--	0.500	U	--	--	--	--	0.010	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	--	0.200	U	--
Field Blank	YVD-120517-32	12/5/2017	FB	K1713091	0.100	UJ	HTQ	0.500	UJ	MSD	--	--	--	0.010	U	--	--	--	--	--	--	--	0.210	U	--	**0.070**	J	--	**0.710**	--	--
Field Blank	YVD-120617-25	12/6/2017	FB	K1713157	0.100	U	--	0.500	U	--	--	--	--	0.010	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	MBK	0.200	U	--
Field Blank	YVD-031818-01	3/18/2018	FB	870610	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-031918-10	3/19/2018	FB	870634	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-060318-01	6/3/2018	FB	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
Field Blank	YVD-060418-12	6/4/2018	FB	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-060518-26	6/5/2018	FB	874860	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-061218-33	6/12/2018	FB	875438	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-090918-01	9/9/2018	FB	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-121018-01	12/10/2018	FB	884857	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-121118-12	12/11/2018	FB	884939	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-031719-01	3/17/2019	FB	988239	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-031819-11	3/18/2019	FB	988273	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-032019-20	3/20/2019	FB	988477	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-060219-01	6/2/2019	FB	991939	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	**0.460**	--	--
Field Blank	YVD-060319-13	6/3/2019	FB	992053	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	**0.340**	--	--
Field Blank	YVD-060419-26	6/4/2019	FB	992242	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	**0.130**	--	--
Field Blank	YVD-090919-01	9/9/2019	FB	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-090919-03	9/9/2019	FB	998357	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-091019-15	9/10/2019	FB	998438	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-091019-17	9/10/2019	FB	998438	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-120919-01	12/9/2019	FB	902276	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-120919-09	12/9/2019	FB	902276	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-121019-16	12/10/2019	FB	902321	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-121019-18	12/10/2019	FB	902321	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-033020-01	3/30/2020	FB	006241	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-033020-03	3/30/2020	FB	006241	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-033120-13	3/31/2020	FB	006260	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-033120-15	3/31/2020	FB	006260	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-060820-01	6/8/2020	FB	009144	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-060820-02	6/8/2020	FB	009144	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-060920-11	6/9/2020	FB	009269	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-060920-13	6/9/2020	FB	009269	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-061020-29	6/10/2020	FB	009361	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-061020-28	6/10/2020	FB	009361	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-092020-01	9/20/2020	FB	013864	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-092020-02	9/20/2020	FB	013864	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-092120-10	9/21/2020	FB	013896	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-092120-12	9/21/2020	FB	013896	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-120720-01	12/7/2020	FB	017035	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-120720-03	12/7/2020	FB	017035	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-120820-16	12/8/2020	FB	017137	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-120820-18	12/8/2020	FB	017137	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-030121-01	3/1/2021	FB	119931	0.050	U	--	1.10	J	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-030121-03	3/1/2021	FB	119931	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-030221-11	3/2/2021	FB	120034	0.050	U	--	0.800	J	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-030221-13	3/2/2021	FB	120034	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-060621-01	6/6/2021	FB	124053	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-060621-02	6/6/2021	FB	124053	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-060721-11	6/7/2021	FB	124105	0.050	U	--	0.800	J	MS, RPD	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-060721-12	6/7/2021	FB	124105	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-060821-20	6/8/2021	FB	124212	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-060821-21	6/8/2021	FB	124212	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-121421-01	12/14/2021	FB	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-121521-13	12/15/2021	FB	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
Field Blank	YVD-031422-01	3/14/2022	FB	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-031522-09	3/15/2022	FB	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-060522-01	6/5/2022	FB	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-060622-13	6/6/2022	FB	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-060722-23	6/7/2022	FB	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-060822-33	6/8/2022	FB	K2206299	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-091322-01	9/13/2022	FB	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-091422-14	9/14/2022	FB	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-120622-01	12/6/2022	FB	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-120722-08	12/7/2022	FB	K2214479	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-120822-12	12/8/2022	FB	K2214578	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-122722-22	12/27/2022	FB	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-030523-01	3/5/2023	FB	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-030623-07	3/6/2023	FB	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-061923-01	6/19/2023	FB	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-062023-05	6/20/2023	FB	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-062123-21	6/21/2023	FB	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-091023-02	9/10/2023	FB	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-091123-08	9/11/2023	FB	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Blank Check	WW-1	4/25/2016	BC	59032861	40.0	U	--	**1.40**	--	--	--	--	--	0.25	U	--	--	--	--	--	--	--	**190**	--	--	**400**	--	--	100	U	--
Blank Check	DW-1	4/25/2016	BC	59032861	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Blank Check	DI-1	4/25/2016	BC	59032861	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--

Table 8
Historical Groundwater Analytical Results

Notes:
1. Well dry; no sample could be collected.
Bold: detected result
-- : not applicable
(as N): reported as nitrogen
(as CaCO3): reported as calcium carbonate
BC: blank check
DUP: Laboratory duplicate relative percent difference was outside acceptance limits.
EB: equipment blank
EPA: U.S. Environmental Protection Agency
ERL: elevated reporting limit
FB: field blank
FBK: field blank contamination
FD: field duplicate
FDP: Field duplicate relative percent difference exceeded acceptance limits.
HTQ: Analysis completed outside of the designated holding time.
J: The compound was positively identified; however, the associated numerical value is an estimated concentration.
J-: The result is an estimated quantity, but the result may be biased low.
J+: The result is an estimated quantity, but the result may be biased high.
MBK: method blank contamination
mg/L: milligrams per liter
MSD: The matrix spike/matrix spike duplicate percent recoveries were outside target limits.
N: normal sample
NR: Sample did not meet collection criteria; not a representative sample.
NS: Not sampled
PRS: Incorrect sample preservation.
R: The sample results are rejected as unusable. The compound may or may not be present in the sample.
RPD: Relative percent difference was outside acceptance limits.
SM: Standard Method
U: The compound was analyzed for but not detected. The associated value is the compound reporting limit, or the compound is considered non-detect at the listed value due to associated blank contamination.
UJ: The compound was not detected above the reported sample reporting limit; however, the reporting limit is approximate and may or may not represent the actual limit of quantitation.

Appendix D
Data Validation Report

1201 3rd Avenue, Suite 2600
Seattle, Washington 98101
206.287.9130

ANCHOR QEA

Data Validation Report – EPA Stage 2A

October 9, 2023

Project: Yakima Valley Dairies

Project Number: 220996-01.01

Validation Number: AQ-2023-0178

This report summarizes the review of analytical results for 17 water samples, two field duplicate samples, and two field blank samples collected on September 10 and 11, 2023. The samples were collected by Anchor QEA, LLC, and submitted to ALS Environmental (ALS), in Kelso, Washington. The samples were analyzed for the following:

- Nitrate by U.S. Environmental Protection Agency (EPA) Method 300.0
- Nitrate + nitrite by EPA Method 353.2

ALS sample data groups (SDGs) K2310138 and K2310209 were reviewed in this report. Sample IDs, matrices, and analyses are presented in Table 1.

Table 1
Sample IDs, Matrices, and Analyses

Location ID	Sample ID	Lab Sample ID	Matrix	Analyses
YVD-08	YVD-091023-01	K2310138-001	Water	Nitrate
FB	YVD-091023-02	K2310138-002	Water	Nitrate
YVD-10	YVD-091023-03	K2310138-003	Water	Nitrate
DC-03D	YVD-091023-04	K2310138-004	Water	Nitrate
YVD-10 (FD)	YVD-091023-05	K2310138-005	Water	Nitrate
DC-03	YVD-091023-06	K2310138-006	Water	Nitrate
YVD-09	YVD-091123-07	K2310138-007	Water	Nitrate
FB	YVD-091123-08	K2310138-008	Water	Nitrate
YVD-09 (FD)	YVD-091123-09	K2310138-009	Water	Nitrate
DC-14	YVD-091123-10	K2310138-010	Water	Nitrate
YVD-11	YVD-091123-11	K2310138-011	Water	Nitrate
YVD-14R	YVD-091123-12	K2310138-012	Water	Nitrate
DC-07	YVD-091123-14	K2310138-014	Water	Nitrate
DC-05	YVD-091123-16	K2310138-016	Water	Nitrate
YVD-16	YVD-091123-17	K2310138-017	Water	Nitrate
DC-05D	YVD-091123-18	K2310209-001	Water	Nitrate
YVD-12	YVD-091123-19	K2310138-018	Water	Nitrate
YVD-15	YVD-091123-20	K2310209-002	Water	Nitrate
YVD-13	YVD-091123-21	K2310209-003	Water	Nitrate

Location ID	Sample ID	Lab Sample ID	Matrix	Analyses
DC-04	YVD-091123-22	K2310209-004	Water	Nitrate
YVD-18	YVD-091123-23	K2310209-005	Water	Nitrate

Notes:
FB: field blank
FD: field duplicate

Data Validation and Qualifications

The following comments refer to the laboratory's performance in meeting the quality assurance/quality control guidelines outlined in the analytical procedures. Laboratory results were reviewed using the laboratory control limits and the following guidelines:

- *Groundwater Monitoring Quality Assurance Project Plan, Addendum No. 1* (Anchor QEA 2016)
- *Groundwater Monitoring Quality Assurance Project Plan, Update No. 2* (Anchor QEA 2018)
- *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods* (EPA 1986)
- *National Functional Guidelines for Inorganic Superfund Methods Data Review* (EPA 2020)

Unless noted in this report, laboratory results for the samples listed in Table 1 were within quality control criteria.

Field Documentation

Field documentation was checked for completeness and accuracy. The chain-of-custody forms were signed by ALS at the time of sample receipt. Samples were received in good condition and within the recommended temperature range. One sample, YVD-091023-05, was incorrectly labeled as YVD-091023-03, and the label was corrected by reconciling sample collection time.

Holding Times and Sample Preservation

Samples were appropriately preserved and analyzed within holding times, except for several samples that required analysis at a lesser dilution performed outside the analytical hold time. Results were confirmed within hold time and analyzed by EPA Method 353.2, and results for EPA Method 300.0 were reported with "UJ" or "J" qualifiers.

Laboratory Method Blanks

Laboratory method blanks were analyzed at the required frequencies. All method blanks were free of target analytes.

Quality Control

Field Blanks

Two field blanks were collected in association with these sample sets. Samples were unnecessarily diluted during initial analysis, resulting in missed holding time and confirmation by EPA Method 353.2. No target analytes were detected in the blanks.

Field Duplicates

Two field duplicates were collected in association with these sample sets. All relative percent difference (RPD) values were within control limits. Detected results are summarized in Table 2.

Table 2
Field Duplicate Summary

Analyte	YVD-091123-07	YVD-091123-09	RPD
Nitrate	65.7 mg/L	65.6 mg/L	0.15%

Analyte	YVD-091023-03	YVD-091023-05	RPD
Nitrate	70.3 mg/L	70.4 mg/L	0.14%

Note:
mg/L: milligram per liter

Laboratory Control Samples

Laboratory control samples were analyzed at the required frequency, and all analyses resulted in recovery values within project-required control limits.

Matrix Spike and Matrix Spike Duplicate Samples

Matrix spike (MS) samples and matrix spike duplicate (MSD) samples were analyzed on three project samples. All MS/MSD recoveries and/or RPD values were within project-required control limits.

Laboratory Duplicates

Laboratory duplicates were analyzed on three project samples. All RPD values were within project-required control limits.

Sample Analyses

An additional container was submitted for preservation and archive for each sample for use as nitrate concentration verification. If the laboratory was unable to analyze a sample for nitrate by EPA Method 300.0 within the 48-hour hold time, the archived sample was analyzed by EPA Method 353.3,

which is a measurement of both nitrate and nitrite. Some samples submitted for analysis by Method 300.0 required additional dilution, resulting in missed holding time. These samples had nitrate concentration verified by Method 353.2 analysis. Two rinse blanks were analyzed for nitrate and nitrate + nitrite, and results were below detection for both analyses. Results are presented in Table 3.

Table 3
Comparison of Results for Nitrate and Nitrate + Nitrite

Sample ID	Nitrate	Nitrate + Nitrite	RPD
YVD-091023-02	0.1U mg/L	0.05U mg/L	NA
YVD-091023-08	0.1U mg/L	0.05U mg/L	NA

Note:
NA: not applicable

Method Reporting Limits

Method reporting limits (MRLs) were acceptable as reported. All values below detection were reported using the laboratory MRLs. Values were reported as undiluted or diluted, in which case the MRL accurately reflects the dilution factor.

Overall Assessment

As was determined by this evaluation, the laboratory followed the specified analytical methods, and all requested sample analyses were completed. Accuracy was acceptable, as demonstrated by the laboratory control and MS/MSD samples. Precision was acceptable, as demonstrated by the laboratory and field duplicates. All data are acceptable as reported or as qualified. Project completeness was 100%. One sample was not collected at well YVD-02 because the well was dry.

Data Qualifier Definitions

J Indicates an estimated value

U Indicates the compound or analyte was analyzed for but not detected at or above the specified limit

UJ Indicates the compound or analyte was analyzed for but not detected and that the specified limit reported is estimated

Table 4
Data Qualification Summary

Sample ID	Parameter	Analyte	Reported Result	Qualified Result	Reason
YVD-091023-01	Conventionals	Nitrate	76.9 mg/L	76.9J mg/L	Hold time exceedance
YVD-091023-02	Conventionals	Nitrate	0.1U mg/L	0.1UJ mg/L	
YVD-091023-03	Conventionals	Nitrate	70.3 mg/L	70.3J mg/L	
YVD-091023-04	Conventionals	Nitrate	36.7 mg/L	36.7J mg/L	
YVD-091123-05	Conventionals	Nitrate	70.4 mg/L	70.4J mg/L	
YVD-091023-06	Conventionals	Nitrate	139 mg/L	139J mg/L	
YVD-091123-08	Conventionals	Nitrate	0.1U mg/L	0.1UJ mg/L	
YVD-091123-18	Conventionals	Nitrate	11.4 mg/L	11.4J mg/L	Hold time exceedance
YVD-091123-20	Conventionals	Nitrate	13 mg/L	13J mg/L	Hold time exceedance
YVD-091123-21	Conventionals	Nitrate	36.1 mg/L	36.1J mg/L	Hold time exceedance
YVD-091123-22	Conventionals	Nitrate	24.9 mg/L	24.9J mg/L	Hold time exceedance
YVD-091123-23	Conventionals	Nitrate	28.4 mg/L	28.4J mg/L	Hold time exceedance

References

Anchor QEA (Anchor QEA, LLC), 2016. *Groundwater Monitoring Quality Assurance Project Plan, Addendum No. 1*. Prepared for Yakima Valley Dairies. November 2016.

Anchor QEA, 2018. *Groundwater Monitoring Quality Assurance Project Plan, Update No. 2*. Prepared for Yakima Valley Dairies. March 2018.

EPA (U.S. Environmental Protection Agency), 1986. *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*. Third Edition. Office of Solid Waste and Emergency Response. EPA-530/SW-846. September 1986.

EPA, 2020. *National Functional Guidelines for Inorganic Superfund Methods Data Review*. Office of Superfund Remediation and Technology Innovation. EPA-542-R-20-006. November 2020.

Eric Winiecki Declaration
Exhibit M

949 Market Street, Suite 700
Tacoma, Washington 98402
206.287.9130

ANCHOR QEA

February 5, 2024

Eric Winiecki
United States Environmental Protection Agency
Region 10
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101-3140

Re: Fourth Quarter 2023 Groundwater Monitoring Data Report, Yakima Valley Dairies, SDWA-10-2013-0080

This quarterly groundwater monitoring report (report) has been prepared to supplement groundwater data collection initiated under the Administrative Order on Consent (AOC) Statement of Work.

The AOC requires 8 years of quarterly groundwater monitoring, which was completed in Second Quarter 2021. Under the AOC, this 8-year monitoring period is to be followed by data evaluation and a formal determination of next steps. This data evaluation process is ongoing.

Pending completion of the data evaluation process and definition of next steps under the AOC, the U.S. Environmental Protection Agency (EPA) and the Respondents to the AOC exchanged correspondence regarding the value of conducting continued nitrate monitoring. The monitoring data contained in this report were collected voluntarily consistent with a written proposal made by the Respondents in a letter to EPA dated October 4, 2021, and repeated in follow-up letters dated November 11, 2021, and December 10, 2021. In the December 10, 2021, letter, the Respondents informed EPA that they planned to continue voluntary groundwater monitoring beginning in Fourth Quarter 2021, and therefore the Fourth Quarter 2023 groundwater monitoring event was voluntarily conducted.

EPA replied to the Respondents' groundwater monitoring proposal in a letter dated January 25, 2022. In that letter, EPA stated that the AOC did not require continued groundwater monitoring at this time but that it was consistent with the goals of the AOC.

The Fourth Quarter 2023 groundwater monitoring event was conducted from December 3 to 7, 2023.

Groundwater monitoring was conducted using methods defined in the 2018 *Groundwater Monitoring Quality Assurance Project Plan* (QAPP; Anchor QEA 2018). Deviations from the QAPP as part of the Third Quarter 2023 monitoring event were as follows:

- Monitoring was performed on the subset of wells identified in the October 4, 2021, proposal from the Respondents to EPA. This excluded those wells that were dry and certain wells that

have been consistently below the nitrate maximum contaminant level (MCL) for at least the preceding eight monitoring events.

- Monitoring parameters were limited to those identified in the October 4, 2021, proposal from the Respondents to EPA and included groundwater elevation, groundwater field parameters, and nitrate concentrations.

The locations of the monitoring wells are shown in Figure 1. The wells monitored in the current event are listed in Table 1.

Groundwater Monitoring Activities

Depth to Static Water Level Measurement

Water level measurements were collected from all 26 wells in the monitoring network on December 3, 2023, using an electronic water level meter. The depths to water were measured to the nearest 0.01 foot from the indicated reference point on each well casing and recorded on the Water Level Survey Form presented in Appendix D of the 2018 QAPP. The depth-to-water measurements were collected from the 26 wells in as short a time period as possible (approximately 8 hours) to provide a "snapshot" of groundwater elevations and to reduce the effect of atmospheric pressure changes or precipitation events on the water levels. Depth-to-water measurements were converted to groundwater elevations in the North American Vertical Datum of 1988 (NAVD88) by subtracting the measurements from the surveyed reference point elevation for each well. The depth-to-water measurements and calculated groundwater elevations for Fourth Quarter 2023 are shown in Table 2.

Groundwater Elevation Trends

Non-vented Solinst Levelogger Junior Edge pressure transducers were initially installed in six wells (YVD-03, YVD-08, YVD-11, DC-03, DC-05, and DC-05D), along with a Solinst Barologger Edge barometric pressure transducer deployed at well YVD-08 to compensate water levels for atmospheric pressure. However, the transducers are no longer operational due to equipment failures.

Groundwater elevation trends continue to be monitored using the quarterly groundwater elevation measurements. Groundwater hydrographs developed from these data are included in Appendix A of this report for all wells.

Groundwater Elevation Seasonal Patterns

The hydrographs for many of the monitoring wells show a seasonal pattern of water level increases and decreases. For example, the water level in monitoring well YVD-02 historically increased about 12 feet from first quarter to second quarter before an adjacent irrigation ditch was converted to a closed pipe, after which the seasonal pattern became less pronounced and the well eventually went dry.

Another example of seasonal water level fluctuation is observed in well YVD-17, which is located adjacent to the large, unlined Southside irrigation canal run by the Sunnyside Valley Irrigation District (Figure 1). According to the District fact sheet, irrigation usually runs from April 1 through October 20 with canal priming operations beginning in mid-March. The water elevation in YVD-17 varies seasonally by about 6 feet. The lowest water level of each year has consistently occurred in the first quarter (approximately April 1), and the highest water level of each year has consistently occurred in the third quarter (approximately October 1). This suggests that the travel time of water from the flowing irrigation canal to the relatively shallow drinking water aquifer at YVD-17 is likely in the range of days to weeks.

EPA has concluded that the seasonal fluctuations observed at monitoring wells indicate that percolation of water from the land surface to the aquifer can and does occur in a range of days to months. The time of travel depends on many factors including the soil type, existing amount of water in the soil, the duration and amount of water, evapotranspiration, and depth to the water table. The percolating water could originate from surface water such as a canal or pond, excess irrigation water from a field, an earthen lagoon, precipitation, or some other source. The groundwater elevation seasonal patterns for each monitoring well are shown in Figure 2 and the following table:

Monitoring Well ID	Clear Seasonal Pattern? (Y/N)	Well Depth from Ground Surface to Mid-Point of Screen (feet)	Highest Groundwater Elevation in 3Q (Fall) and Lowest in 1Q (Spring)	Highest Groundwater Elevation in 4Q (Winter) and Lowest in 2Q (Summer)	Highest Groundwater Elevation in 1Q (Spring) and Lowest in 3Q (Fall)
YVD-17	Y	38	X		
DC-04	Y	40	X		
DC-07	Y	49		X	
DC-03	Y	73	X		
DC-05	Y	74		X	
YVD-14R	Y	81		X	
YVD-10	Y	93			X
YVD-15	Y	95		X	
YVD-11	N	107			
DC-03D	Y	111	X		
YVD-09	N	112			
YVD-16	Y	112			X
DC-05D	Y	122		X	
YVD-13	Y	131		X	
DC-14	N	139			
YVD-12	Y	141			X
DC-01	N	150			

Monitoring Well ID	Clear Seasonal Pattern? (Y/N)	Well Depth from Ground Surface to Mid-Point of Screen (feet)	Highest Groundwater Elevation in 3Q (Fall) and Lowest in 1Q (Spring)	Highest Groundwater Elevation in 4Q (Winter) and Lowest in 2Q (Summer)	Highest Groundwater Elevation in 1Q (Spring) and Lowest in 3Q (Fall)
YVD-07	Y	158			X
YVD-06	Y	159			X
YVD-05	Y	172			X
YVD-08	Y	172			X
YVD-18	Y	175		X	
DC-09	Y	184			X
YVD-03	Y	190			X
YVD-04	Y	235			X

Sample Collection

Groundwater samples were collected using low-flow purging and sampling procedures described in the Standard Operating Procedure entitled *Low-Flow Groundwater Purging and Sampling Procedures for Monitoring Wells* presented in Appendix E of the 2018 QAPP.

Purging and sampling of the monitoring wells were performed with dedicated 1-inch-diameter stainless-steel Solinst Model 407 bladder pumps with polytetrafluoroethylene (Teflon) bladders installed in each well.

A sample could not be collected at monitoring well YVD-02; the well was dry during the groundwater monitoring event.

Sample Handling and Custody

All samples were accompanied by a chain-of-custody record according to procedures described in the 2018 QAPP. When custody of samples was transferred, the individuals relinquishing and receiving the samples signed and dated the chain-of-custody record. The chain-of-custody record documents the custody transfer from the sampler, often through another agent (e.g., a shipping/transport company), to the laboratory sample custodian.

All samples collected for laboratory analyses were delivered to ALS Environmental, located at 1317 S. 13th Ave. in Kelso, Washington. Three sample delivery groups were submitted to the analytical laboratory; the delivery groups and collection dates are as follows:

Sample Delivery Group	Samples Collected	Date Received by Laboratory
K2313548	December 3 and 4, 2023	December 5, 2023
K2313657	December 4, 2023	December 6, 2023
K2313796	December 6 and 7, 2023	December 8, 2023

Field Sampling Data Sheets were completed for each sample and indicate what type of samples were collected, sample identification, sample bottle types and volumes collected, field parameter measurements, and other pertinent information (including significant events and observations that occurred during sampling activities). Enough information was noted on field sampling forms to enable participants to reconstruct events that occurred and to refresh the memory of field personnel, if needed. Original copies of all field forms and chain-of-custody documents were retained by the Yakima Valley Dairies'[1] Field Lead in the project files. Dairy owner certifications are included in Appendix B. Copies of the field forms from Fourth Quarter 2023 are presented in Appendix C.

Analytical Program

Corrective Actions

No corrective actions were required for the Fourth Quarter 2023 sampling event.

Data Review, Verification, and Validation

All data underwent a Stage 2 validation, which included a data package completeness review. Data were validated in accordance with the EPA *National Functional Guidelines for Superfund Organic Methods Data Review* (EPA 2014). The Data Validation Report (DVR) is presented in Appendix D. Data qualified as a result of data validation are listed as follows:

- Three samples from Sample Delivery Group K2313548 were analyzed outside of the 48-hour hold time for nitrate (as nitrogen) by EPA Method 300.0. Those results have been assigned a "J" qualifier to indicate that they are estimated.
- Six samples from Sample Delivery Group K2313657 were analyzed outside of the 48-hour hold time for nitrate (as nitrogen) by EPA Method 300.0. Those results have been assigned a "J" qualifier to indicate that they are estimated.

[1] Collectively, the following are referred to as the Yakima Valley Dairies: 1) Cow Palace, LLC; 2) D&A Dairy, LLC (also known as D and A Dairy L.L.C.), George DeRuyter & Son Dairy, LLC, and George & Margaret, LLC; and 3) Liberty Dairy, LLC, and its associated dairy facility H&S Bosma Dairy.

- Five samples from Sample Delivery Group K2313796 were analyzed outside of the 48-hour hold time for nitrate (as nitrogen) by EPA Method 300.0. Those results have been assigned a "J" qualifier to indicate that they are estimated.

Any deviation from the 2018 QAPP was either documented within this memorandum or in the DVR. Results met project data quality goals and criteria and are usable for all purposes.

Groundwater Monitoring Results

Site Hydrogeology

The groundwater flow direction at the site is generally to the southwest at an average hydraulic gradient of 0.0127.[2] Hydraulic gradients are greater in the topographically higher areas in the northern section of the site, with an average of 0.0262. As groundwater flows to the southwest toward the center of the Yakima River valley, hydraulic gradients decrease to approximately 0.0108 in the central portion of the site and then decrease further to 0.0041 in the southern portion of the site. The estimated average linear groundwater flow velocities for the shallow surficial aquifer at the Dairies range from 0.7 to 25.0 feet per day across the site. These estimated values are based on estimated hydraulic conductivity values based on observed soil types and have not been confirmed with site-specific aquifer testing (e.g., slug tests).

A groundwater elevation contour map for the surficial aquifer based on Fourth Quarter 2023 depth to groundwater measurements is shown in Figure 1. Groundwater elevation measurements for Fourth Quarter 2023 and monitoring well construction details are provided in Tables 2 and 3, respectively. Historical groundwater elevations are provided in Table 4. Estimated possible average linear flow velocity values for Fourth Quarter 2023 are provided in Table 5. Groundwater hydrographs for all 26 wells are provided in Appendix A.

Groundwater Sampling Results

Groundwater field parameters collected during well purging included dissolved oxygen, pH, oxidation-reduction potential, specific conductance, temperature, and turbidity. Field parameter measurements are presented in Table 6.

Groundwater from the 17 wells sampled was analyzed for nitrate (as nitrogen) by EPA Method 300.0.

The nitrate results for Fourth Quarter 2023 are presented spatially on a map in Figure 3 and are shown in Table 7. Historical nitrate concentrations from 2013 through 2017 are presented in Figure 4a and from 2018 to present in Figure 4b. Nitrate concentration trend plots are presented in

[2] Hydraulic gradients values are in units of vertical feet per horizontal feet and are presented unitless.

Figures 5 through 9. A summary of historical groundwater analytical results is presented in Table 8. Analytical laboratory reports are provided in Appendix E.

The monitoring well network includes wells that are located upgradient and downgradient of the Dairies. There are four groundwater monitoring wells located upgradient of the Dairy facilities' footprint. All four wells are screened at the water table. Historically, the nitrate concentrations in the four upgradient wells have been consistently below the nitrate MCL of 10 milligrams per liter (mg/L). As noted previously, YVD-02 was dry during Fourth Quarter 2023, and a sample could not be collected. YVD-02 is screened in a shallow basalt layer just downgradient of a former irrigation canal that has now been replaced by an enclosed pipe. After the open ditch was replaced by the piped conveyance, groundwater elevations decreased in the well until the well went dry; a sample has not been collected from YVD-02 since Second Quarter 2020.

Nitrate concentrations reported in mg/L in the upgradient monitoring well for Fourth Quarter 2023 are as follows:

Upgradient Well	Nitrate (mg/L)
YVD-02	Dry – Not Sampled

Nitrate concentrations in the 14 downgradient monitoring wells that are screened at the water table for Fourth Quarter 2023 are as follows:

Downgradient Water Table Wells	Nitrate (mg/L)
DC-03	137 J
DC-04	23.2
DC-05	50.9
DC-07	2.92
DC-14	43.0 J
YVD-08	52.0
YVD-09	66.9 J
YVD-10	64.3 J
YVD-11	72.4
YVD-12	16.0 J
YVD-13	38.0 J
YVD-14R	111 J
YVD-15	14.0 J
YVD-16	25.5 J

Note:
J: estimated value

The nitrate concentration in one downgradient water table well (DC-07) was below the nitrate MCL during this monitoring event.

Recent trends in nitrate concentrations in wells screened at the water table include the following:

- Nitrate was detected at a concentration of 137 mg/L at well DC-03 in Fourth Quarter 2023. This well's five historically lowest concentrations have been detected in the previous five quarters.
- Nitrate was detected at a concentration of 111 mg/L at well YVD-14R. Nitrate concentrations have been slowly decreasing in this well from a historical high of 140 mg/L in Third Quarter 2019.
- Nitrate concentrations at well DC-07 have been below the MCL for five consecutive quarters after being above the MCL for seven of the eleven previous quarters.
- Nitrate concentrations have decreased for six consecutive quarters at well DC-14 (from 57.4 mg/L in Second Quarter 2022 to 43.0 mg/L in Fourth Quarter 2023). Data indicate that the increasing trend noted between 2018 and 2022 in this well has terminated.
- Nitrate was detected at a historically high concentration of 50.9 mg/L at well DC-05. This represents three consecutive quarters of increasing concentrations at this well after three quarters of historically low concentrations (between 10.0 and 19.0 mg/L) from Third Quarter 2022 through First Quarter 2023.
- Nitrate was detected at a concentration of 64.3 mg/L in well YVD-10. Nitrate concentrations have been generally decreasing in this well, with fluctuations, since a historical high concentration of 123 mg/L in First Quarter 2017.
- Nitrate concentrations decreased at wells YVD-08 and YVD-11 from historical highs of 76.9 mg/L and 104 mg/L in Third Quarter 2023 to 52.0 mg/L and 72.4 mg/L in Fourth Quarter 2023, respectively.
- Nitrate concentrations have been gradually increasing at YVD-09 from a low of 42.8 mg/L in Fourth Quarter 2016 to a historical high of 66.9 mg/L in Fourth Quarter 2023.
- Nitrate concentrations have been gradually increasing at well YVD-13 since Third Quarter 2017 after 4 years of generally stable concentrations (2013 to 2017). Concentrations have steadily increased from 23.2 mg/L in Third Quarter 2017 to a historically high concentration of 38.0 mg/L in Fourth Quarter 2023.

Three downgradient groundwater monitoring wells were constructed with well screens positioned at depths that were estimated by EPA to approximate the depth of a typical residential drinking water

well in the area. Each of these deeper wells was paired at the same location with a water table well. The results for each well pair, with the water table well listed above its deeper counterpart, are as follows:

Well Placement	Shallow/Deep Well Pair	Nitrate (mg/L)	Shallow/Deep Well Pair	Nitrate (mg/L)	Shallow/Deep Well Pair	Nitrate (mg/L)
Shallow Well	YVD-13	38.0 J	DC-03	137 J	DC-05	50.9
Deep Well	YVD-18	30.2 J	DC-03D	36.9 J	DC-05D	13.8

Note:
J: estimated value

The results from all the well pairs indicate stratified conditions, with generally higher nitrate concentrations at the top of the water table and lower concentrations at depth. Nitrate concentration trends at well pairs are detailed as follows:

- The nitrate concentrations in the YVD-13/YVD-18 well pair were initially higher in the shallow well (YVD-13) but then approximately equal from First Quarter 2017 through Second Quarter 2019. Since Third Quarter 2019, nitrate concentrations in water table well YVD-13 have been increasing relative to the deeper well YVD-18.
- Nitrate concentrations in water table well DC-05 have historically been greater than co-located deeper well DC-05D. The nitrate concentrations in DC-05D have historically been slightly greater than the nitrate MCL.
- Nitrate concentrations in water table well DC-03 have decreased significantly since First Quarter 2022 to a concentration of 137 mg/L in Fourth Quarter 2023. Nitrate concentrations in well DC-03D remain much lower and are generally stable without significant increases or decreases over time.

EPA has not yet approved formal trend analyses procedures for use with the project. See Figures 5 through 9 for plots of observed nitrate concentrations over time in the AOC monitoring wells.

References

Anchor QEA, 2018. *Groundwater Monitoring Quality Assurance Project Plan*. Yakima Valley Dairies/SDWA-10-2013-0080. Prepared for Yakima Valley Dairies. February 2018.

EPA (U.S. Environmental Protection Agency), 2014. *National Functional Guidelines for Superfund Organic Methods Data Review*. Office of Superfund Remediation and Technology Innovation, U.S. Environmental Protection Agency, Washington, DC. EPA-540-R-014-002. August 2014.

Recipients

Adam Dolsen, Cow Palace, LLC
Dan DeRuyter, George DeRuyter & Son Dairy, LLC; D&A Dairy, LLC; George & Margaret, LLC
Henry Bosma, Liberty Dairy, LLC; H&S Bosma Dairy

Eric Winiecki, U.S. Environmental Protection Agency, Region 10
Charles Clabaugh, U.S. Environmental Protection Agency, Region 10
Jennifer MacDonald, U.S. Environmental Protection Agency, Region 10
John (Matthew) Moore, U.S. Environmental Protection Agency, Region 10
Meredith Weinberg, Perkins Coie LLP
Brendan Monahan, Stokes Lawrence PS
Lori Terri Gregory, Foster Pepper PLLC
Mark Larsen, Anchor QEA

Accompanying Materials

Tables

Table 1	Groundwater Monitoring Frequency
Table 2	Summary of Groundwater Elevations – Fourth Quarter 2023
Table 3	Monitoring Well Construction Details
Table 4	Historical Groundwater Elevations
Table 5	Estimated Possible Average Linear Groundwater Flow Velocities – Fourth Quarter 2023
Table 6	Field Parameter Measurements – Fourth Quarter 2023
Table 7	Groundwater Analytical Results – Fourth Quarter 2023
Table 8	Historical Groundwater Analytical Results

Figures

Figure 1	Surficial Aquifer Groundwater Elevation Contour Map Fourth Quarter 2023
Figure 2	Seasonal Groundwater Elevation Patterns
Figure 3	Nitrate Concentrations in Groundwater Fourth Quarter 2023
Figure 4a	Historical Nitrate Concentrations in Groundwater – 2013 through 2017
Figure 4b	Historical Nitrate Concentrations in Groundwater – 2018 to present
Figure 5	Nitrate Concentrations – East Downgradient Wells
Figure 6	Nitrate Concentrations – West Downgradient Wells
Figure 7	Nitrate Concentrations – Central Downgradient Wells
Figure 8	Nitrate Concentrations – Northern Downgradient Wells
Figure 9	Nitrate Concentrations – Upgradient Wells

Appendices

Appendix A	Groundwater Hydrographs
Appendix B	Owner Certifications
Appendix C	Groundwater Sampling Records
Appendix D	Data Validation Report
Appendix E	Analytical Laboratory Reports

Tables

Table 1
Groundwater Monitoring Frequency

Well ID	Manual Groundwater Elevation Measurements (Quarterly)	Long-Term Groundwater Elevation Measurements (Every Quarter Hour)	Groundwater Sampling Frequency	
			Quarterly	Annually (Second Quarter Event)
DC-01	X			X
DC-03	X	X	X	X
DC-03D	X		X	X
DC-04	X		X	X
DC-05	X	X[3]	X	X
DC-05D	X	X[3]	X	X
DC-07	X		X	X
DC-09	X			X
DC-14	X		X	X
YVD-02[2]	X		X[2]	X[2]
YVD-03	X	X[1]		X
YVD-04	X			X
YVD-05	X			X
YVD-06	X			X
YVD-07	X			X
YVD-08	X	X[1]	X	X
YVD-09	X		X	X
YVD-10	X		X	X
YVD-11	X	X[3]	X	X
YVD-12	X		X	X
YVD-13	X		X	X
YVD-14R	X		X	X
YVD-15	X		X	X
YVD-16	X		X	X
YVD-17	X			X
YVD-18	X		X	X

Notes:
1. These wells currently do not have installed transducers. The transducers in these two wells fell down the wells on December 14, 2021, and have not been recovered or replaced.
2. YVD-02 has been dry since Second Quarter 2021 and cannot currently be sampled.
3. These wells currently do not have installed transducers. The transducers in these three wells would not connect to the downloading device and were sent to the manufacturer for data extraction. The transducers have not been replaced in the wells.

Table 2
Summary of Groundwater Elevations – Fourth Quarter 2023

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
DC-01	12/3/2023	1199.17	151.15	1048.02
DC-03	12/3/2023	910.58	76.52	834.06
DC-03D	12/3/2023	911.33	77.18	834.15
DC-04	12/3/2023	877.22	38.09	839.13
DC-05	12/3/2023	911.95	73.90	838.05
DC-05D	12/3/2023	915.91	77.55	838.36
DC-07	12/3/2023	889.29	49.24	840.05
DC-09	12/3/2023	1048.60	164.52	884.08
DC-14	12/3/2023	1036.61	139.55	897.06
YVD-02	12/3/2023	1288.97	Dry	---
YVD-03	12/3/2023	1120.68	197.24	923.44
YVD-04	12/3/2023	1118.66	231.61	887.05
YVD-05	12/3/2023	1051.78	175.35	876.43
YVD-06	12/3/2023	1053.51	109.98	943.53
YVD-07	12/3/2023	1073.03	159.78	913.25
YVD-08	12/3/2023	1014.38	176.74	837.64
YVD-09	12/3/2023	966.81	115.67	851.14
YVD-10	12/3/2023	958.00	95.65	862.35
YVD-11	12/3/2023	967.91	110.46	857.45
YVD-12	12/3/2023	961.91	142.39	819.52
YVD-13	12/3/2023	965.59	131.30	834.29
YVD-14R	12/3/2023	921.41	82.23	839.18
YVD-15	12/3/2023	940.61	97.37	843.24
YVD-16	12/3/2023	975.90	120.97	854.93
YVD-17	12/3/2023	866.73	37.56	829.17
YVD-18	12/3/2023	965.74	131.52	834.22

Notes:

---: no value or not applicable

BTOC: below top of casing

NAVD88: North American Vertical Datum of 1988

Table 3
Monitoring Well Construction Details

Well ID	Coordinates		Top of Casing Elevation (feet NAVD88)	Ground Surface Elevation (feet NAVD88)	Surface Completion	Well Depth (feet bgs)	Casing and Screen Material	Screen Slot Size (inches)	Screen Length (feet)	Depth to Top of Screen (feet bgs)	Depth to Bottom of Screen (feet bgs)	Elevation of Top of Screen (feet NAVD88)	Elevation of Base of Screen (feet NAVD88)	Depth to Top of Filter Pack (feet bgs)	Depth to Bottom of Filter Pack (feet bgs)
	Latitude	Longitude													
Monitoring Wells															
DC-01	46.418795	-120.138185	1199.17	1199.64	Flush	160.0	Schedule 40 PVC	0.020	20.0	140.0	160.0	1059.6	1039.6	136.0	160.0
DC-03	46.386289	-120.146145	910.58	911.04	Flush	85.0	Schedule 40 PVC	0.020	20.0	62.5	82.5	848.5	828.5	58.5	85.0
DC-03D	46.386220	-120.146054	911.33	908.83	Stick-up	116.1	Schedule 40 PVC	0.020	9.5	106.1	115.6	802.7	793.2	100.0	116.5
DC-04	46.382446	-120.131129	877.22	877.62	Flush	51.0	Schedule 40 PVC	0.020	20.0	29.5	49.5	848.1	828.1	24.5	51.0
DC-05	46.382358	-120.120237	911.95	912.35	Flush	86.0	Schedule 40 PVC	0.020	20.0	63.5	83.5	848.9	828.9	59.5	86.0
DC-05D	46.382517	-120.120210	915.91	913.55	Stick-up	126.8	Schedule 40 PVC	0.020	9.5	116.8	126.3	796.8	787.3	114.0	128.0
DC-07	46.389612	-120.141671	889.29	889.78	Flush	61.0	Schedule 40 PVC	0.020	20.0	38.5	58.5	851.3	831.3	34.5	61.0
DC-09	46.404230	-120.120858	1048.60	1048.97	Flush	196.0	Schedule 40 PVC	0.020	20.0	173.5	193.5	875.5	855.5	169.5	196.0
DC-14	46.404240	-120.139685	1036.61	1036.92	Flush	151.0	Schedule 40 PVC	0.020	20.0	128.5	148.5	908.4	888.4	124.5	151.0
YVD-02	46.422601	-120.113697	1288.97	1285.81	Stick-up	35.0	Schedule 40 PVC	0.020	19.5	15.0	34.5	1270.8	1251.3	13.0	36.0
YVD-03	46.414227	-120.139638	1120.68	1118.15	Stick-up	200.1	Schedule 40 PVC	0.020	19.5	180.1	199.6	938.1	918.6	176.0	202.0
YVD-04	46.408062	-120.156224	1118.66	1116.06	Stick-up	245.2	Schedule 40 PVC	0.020	19.5	225.2	244.7	890.9	871.4	220.0	248.0
YVD-05	46.404457	-120.142790	1051.78	1052.26	Flush	182.2	Schedule 40 PVC	0.020	19.5	162.2	181.7	890.1	870.6	156.0	208.0
YVD-06	46.407671	-120.137191	1053.51	1053.88	Flush	169.0	Schedule 40 PVC	0.020	19.5	149.0	168.5	904.9	885.4	144.0	170.0
YVD-07	46.404432	-120.125205	1073.03	1070.59	Stick-up	168.3	Schedule 40 PVC	0.020	19.5	148.3	167.8	922.3	902.8	145.0	169.0
YVD-08	46.396920	-120.152771	1014.38	1011.92	Stick-up	182.5	Schedule 40 PVC	0.020	19.5	162.5	182.0	849.4	829.9	155.0	188.0
YVD-09	46.396832	-120.144078	966.81	964.28	Stick-up	122.3	Schedule 40 PVC	0.020	19.5	102.3	121.8	862.0	842.5	9.5	128.0
YVD-10	46.396978	-120.136165	958.00	955.45	Stick-up	103.1	Schedule 40 PVC	0.020	19.5	83.1	102.6	872.4	852.9	76.0	103.5
YVD-11	46.393446	-120.123627	967.91	965.51	Stick-up	116.9	Schedule 40 PVC	0.020	19.5	96.9	116.4	868.6	849.1	94.0	117.3
YVD-12	46.389730	-120.166996	961.91	959.51	Stick-up	151.4	Schedule 40 PVC	0.020	19.5	131.4	150.9	828.1	808.6	127.0	154.0
YVD-13	46.389708	-120.151673	965.59	963.07	Stick-up	141.0	Schedule 40 PVC	0.020	19.5	121.0	140.5	842.1	822.6	117.0	148.0
YVD-14R	46.389532	-120.145124	920.19	918.80	Stick-up	93.0	Schedule 40 PVC	0.020	20.0	72.0	92.0	846.8	826.8	69.0	93.0
YVD-15	46.389802	-120.137153	940.61	938.08	Stick-up	105.1	Schedule 40 PVC	0.020	19.5	85.1	104.6	853.0	833.5	81.0	128.0
YVD-16	46.389586	-120.114783	975.90	972.99	Stick-up	122.1	Schedule 40 PVC	0.020	19.5	102.1	121.6	870.9	851.4	100.5	127.0
YVD-17	46.380761	-120.142067	866.73	864.28	Stick-up	47.7	Schedule 40 PVC	0.020	19.5	27.7	47.2	836.6	817.1	25.0	58.0
YVD-18	46.389758	-120.151671	965.74	963.42	Stick-up	179.9	Schedule 40 PVC	0.020	9.5	169.9	179.4	793.5	784.0	166.0	181.5
Decommissioned Wells															
YVD-14	46.389536	-120.145067	920.19	917.64	Stick-up	91.0	Schedule 40 PVC	0.020	19.5	71.0	90.5	846.6	827.1	66.0	98.0

Notes:
Latitude and longitude in decimal degrees based on World Geodetic Survey 1984.
bgs: below ground surface
NAVD88: North American Vertical Datum of 1988
PVC: polyvinyl chloride

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
DC-01	9/16/2013	1199.17	150.45	1048.72
DC-01	12/9/2013	1199.17	150.66	1048.51
DC-01	3/16/2014	1199.17	150.43	1048.74
DC-01	6/1/2014	1199.17	150.50	1048.67
DC-01	9/21/2014	1199.17	150.32	1048.85
DC-01	12/14/2014	1199.17	150.20	1048.97
DC-01	3/5/2015	1199.17	150.35	1048.82
DC-01	6/15/2015	1199.17	150.41	1048.76
DC-01	9/21/2015	1199.17	150.50	1048.67
DC-01	12/13/2015	1199.17	150.46	1048.71
DC-01	3/8/2016	1199.17	150.53	1048.64
DC-01	6/19/2016	1199.17	150.70	1048.47
DC-01	9/25/2016	1199.17	150.70	1048.47
DC-01	12/11/2016	1199.17	150.65	1048.52
DC-01	3/5/2017	1199.17	150.55	1048.62
DC-01	6/4/2017	1199.17	150.68	1048.49
DC-01	9/27/2017	1199.17	150.81	1048.36
DC-01	12/3/2017	1199.17	150.74	1048.43
DC-01	3/18/2018	1199.17	150.74	1048.43
DC-01	6/3/2018	1199.17	150.74	1048.43
DC-01	9/8/2018	1199.17	150.44	1048.73
DC-01	12/9/2018	1199.17	150.94	1048.23
DC-01	3/21/2019	1199.17	150.78	1048.39
DC-01	6/1/2019	1199.17	150.85	1048.32
DC-01	9/8/2019	1199.17	150.77	1048.40
DC-01	12/8/2019	1199.17	150.79	1048.38
DC-01	3/29/2020	1199.17	150.74	1048.43
DC-01	6/7/2020	1199.17	150.87	1048.30
DC-01	9/20/2020	1199.17	150.97	1048.20
DC-01	12/6/2020	1199.17	151.06	1048.11
DC-01	2/28/2021	1199.17	150.99	1048.18
DC-01	6/6/2021	1199.17	150.86	1048.31
DC-01	9/20/2021	1199.17	151.13	1048.04
DC-01	12/14/2021	1199.17	150.85	1048.32
DC-01	3/14/2022	1199.17	150.95	1048.22
DC-01	6/5/2022	1199.17	150.84	1048.33
DC-01	9/12/2022	1199.17	151.07	1048.10
DC-01	12/5/2022	1199.17	151.10	1048.07
DC-01	3/5/2023	1199.17	151.02	1048.15
DC-01	6/4/2023	1199.17	151.12	1048.05
DC-01	9/10/2023	1199.17	151.15	1048.02
DC-01	12/3/2023	1199.17	151.15	1048.02

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
DC-03	9/16/2013	910.58	72.43	838.15
DC-03	12/9/2013	910.58	72.55	838.03
DC-03	3/16/2014	910.58	73.62	836.96
DC-03	6/1/2014	910.58	73.25	837.33
DC-03	9/21/2014	910.58	72.26	838.32
DC-03	12/14/2014	910.58	72.40	838.18
DC-03	3/5/2015	910.58	73.60	836.98
DC-03	6/15/2015	910.58	73.12	837.46
DC-03	9/21/2015	910.58	72.35	838.23
DC-03	12/13/2015	910.58	73.64	837.94
DC-03	3/8/2016	910.58	73.99	836.59
DC-03	6/19/2016	910.58	73.84	836.74
DC-03	9/25/2016	910.58	72.87	837.71
DC-03	12/11/2016	910.58	72.93	837.65
DC-03	3/5/2017	910.58	74.20	836.38
DC-03	6/4/2017	910.58	74.21	836.37
DC-03	9/27/2017	910.58	72.81	837.77
DC-03	12/3/2017	910.58	73.11	837.47
DC-03	3/18/2018	910.58	74.54	836.04
DC-03	6/3/2018	910.58	74.08	836.50
DC-03	9/8/2018	910.58	73.24	837.34
DC-03	12/9/2018	910.58	73.32	837.26
DC-03	3/21/2019	910.58	75.01	835.57
DC-03	6/1/2019	910.58	74.94	835.64
DC-03	9/8/2019	910.58	73.95	836.63
DC-03	12/8/2019	910.58	74.10	836.48
DC-03	3/29/2020	910.58	75.90	834.68
DC-03	6/7/2020	910.58	75.52	835.06
DC-03	9/20/2020	910.58	74.46	836.12
DC-03	12/6/2020	910.58	74.56	836.02
DC-03	2/28/2021	910.58	75.94	834.64
DC-03	6/6/2021	910.58	75.89	834.69
DC-03	9/20/2021	910.58	74.90	835.68
DC-03	12/14/2021	910.58	75.22	835.36
DC-03	3/14/2022	910.58	76.71	833.87
DC-03	6/5/2022	910.58	76.44	834.14
DC-03	9/12/2022	910.58	75.79	834.79
DC-03	12/5/2022	910.58	75.91	834.67
DC-03	3/5/2023	910.58	77.45	833.13
DC-03	6/4/2023	910.58	77.61	832.97
DC-03	9/10/2023	910.58	76.74	833.84
DC-03	12/3/2023	910.58	76.52	834.06

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
DC-03D	9/16/2013	911.33	73.03	838.30
DC-03D	12/9/2013	911.33	73.16	838.17
DC-03D	3/16/2014	911.33	74.35	836.98
DC-03D	6/1/2014	911.33	73.90	837.43
DC-03D	9/21/2014	911.33	72.87	838.46
DC-03D	12/14/2014	911.33	73.13	838.20
DC-03D	3/5/2015	911.33	74.28	837.05
DC-03D	6/15/2015	911.33	73.72	837.61
DC-03D	9/21/2015	911.33	72.96	838.37
DC-03D	12/13/2015	911.33	73.31	838.02
DC-03D	3/8/2016	911.33	74.66	836.67
DC-03D	6/19/2016	911.33	74.47	836.86
DC-03D	9/25/2016	911.33	73.44	837.89
DC-03D	12/11/2016	911.33	73.73	837.60
DC-03D	3/5/2017	911.33	75.05	836.28
DC-03D	6/4/2017	911.33	74.88	836.45
DC-03D	9/27/2017	911.33	73.42	837.91
DC-03D	12/3/2017	911.33	73.80	837.53
DC-03D	3/18/2018	911.33	75.30	836.03
DC-03D	6/3/2018	911.33	74.82	836.51
DC-03D	9/8/2018	911.33	73.78	837.55
DC-03D	12/9/2018	911.33	74.01	837.32
DC-03D	3/21/2019	911.33	75.75	835.58
DC-03D	6/1/2019	911.33	75.65	835.68
DC-03D	9/8/2019	911.33	74.55	836.78
DC-03D	12/8/2019	911.33	74.79	836.54
DC-03D	3/29/2020	911.33	76.49	834.84
DC-03D	6/7/2020	911.33	76.19	835.14
DC-03D	9/20/2020	911.33	75.06	836.27
DC-03D	12/6/2020	911.33	75.24	836.09
DC-03D	2/28/2021	911.33	76.66	834.67
DC-03D	6/6/2021	911.33	76.57	834.76
DC-03D	9/20/2021	911.33	75.53	835.80
DC-03D	12/14/2021	911.33	75.88	835.45
DC-03D	3/14/2022	911.33	77.42	833.91
DC-03D	6/5/2022	911.33	77.11	834.22
DC-03D	9/12/2022	911.33	76.46	834.87
DC-03D	12/5/2022	911.33	76.51	834.82
DC-03D	3/5/2023	911.33	78.14	833.19
DC-03D	6/4/2023	911.33	78.27	833.06
DC-03D	9/10/2023	911.33	77.36	833.97
DC-03D	12/3/2023	911.33	77.18	834.15

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
DC-04	9/16/2013	877.22	31.75	845.47
DC-04	12/9/2013	877.22	32.61	844.61
DC-04	3/16/2014	877.22	34.55	842.67
DC-04	6/1/2014	877.22	34.65	842.57
DC-04	9/21/2014	877.22	31.99	845.23
DC-04	12/14/2014	877.22	32.98	844.24
DC-04	3/5/2015	877.22	34.31	842.91
DC-04	6/15/2015	877.22	34.70	842.52
DC-04	9/21/2015	877.22	33.61	843.61
DC-04	12/13/2015	877.22	34.38	842.84
DC-04	3/8/2016	877.22	35.60	841.62
DC-04	6/19/2016	877.22	34.74	842.48
DC-04	9/25/2016	877.22	33.81	843.41
DC-04	12/11/2016	877.22	34.33	842.89
DC-04	3/5/2017	877.22	35.45	841.77
DC-04	6/4/2017	877.22	35.63	841.59
DC-04	9/27/2017	877.22	34.42	842.80
DC-04	12/3/2017	877.22	35.17	842.05
DC-04	3/18/2018	877.22	36.89	840.33
DC-04	6/3/2018	877.22	37.17	840.05
DC-04	9/8/2018	877.22	36.45	840.77
DC-04	12/9/2018	877.22	36.17	841.05
DC-04	3/21/2019	877.22	37.73	839.49
DC-04	6/1/2019	877.22	38.20	839.02
DC-04	9/8/2019	877.22	36.96	840.26
DC-04	12/8/2019	877.22	36.83	840.39
DC-04	3/29/2020	877.22	38.37	838.85
DC-04	6/7/2020	877.22	38.58	838.64
DC-04	9/20/2020	877.22	37.23	839.99
DC-04	12/6/2020	877.22	36.76	840.46
DC-04	2/28/2021	877.22	38.35	838.87
DC-04	6/6/2021	877.22	39.12	838.10
DC-04	9/20/2021	877.22	38.19	839.03
DC-04	12/14/2021	877.22	37.91	839.31
DC-04	3/14/2022	877.22	39.32	837.90
DC-04	6/5/2022	877.22	39.47	837.75
DC-04	9/12/2022	877.22	38.50	838.72
DC-04	12/5/2022	877.22	38.05	839.17
DC-04	3/5/2023	877.22	39.51	837.71
DC-04	6/4/2023	877.22	40.05	837.17
DC-04	9/10/2023	877.22	38.55	838.67
DC-04	12/3/2023	877.22	38.09	839.13

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
DC-05	9/16/2013	911.95	67.78	844.17
DC-05	12/9/2013	911.95	68.28	843.67
DC-05	3/16/2014	911.95	69.25	842.70
DC-05	6/1/2014	911.95	70.15	841.80
DC-05	9/21/2014	911.95	69.43	842.52
DC-05	12/14/2014	911.95	68.80	843.15
DC-05	3/5/2015	911.95	69.33	842.62
DC-05	6/15/2015	911.95	70.28	841.67
DC-05	9/21/2015	911.95	69.94	842.01
DC-05	12/13/2015	911.95	69.59	842.36
DC-05	3/8/2016	911.95	70.58	841.37
DC-05	6/19/2016	911.95	71.43	840.52
DC-05	9/25/2016	911.95	71.08	840.87
DC-05	12/11/2016	911.95	70.24	841.71
DC-05	3/5/2017	911.95	70.98	840.97
DC-05	6/4/2017	911.95	71.81	840.14
DC-05	9/27/2017	911.95	71.14	840.81
DC-05	12/3/2017	911.95	70.50	841.45
DC-05	3/18/2018	911.95	71.06	840.89
DC-05	6/3/2018	911.95	71.33	840.62
DC-05	9/8/2018	911.95	71.39	840.56
DC-05	12/9/2018	911.95	70.82	841.13
DC-05	3/21/2019	911.95	71.46	840.49
DC-05	6/1/2019	911.95	71.95	840.00
DC-05	9/8/2019	911.95	72.09	839.86
DC-05	12/8/2019	911.95	71.47	840.48
DC-05	3/29/2020	911.95	72.43	839.52
DC-05	6/7/2020	911.95	73.11	838.84
DC-05	9/20/2020	911.95	73.38	838.57
DC-05	12/6/2020	911.95	73.03	838.92
DC-05	2/28/2021	911.95	73.97	837.98
DC-05	6/6/2021	911.95	74.88	837.07
DC-05	9/20/2021	911.95	74.92	837.03
DC-05	12/14/2021	911.95	74.08	837.87
DC-05	3/14/2022	911.95	74.52	837.43
DC-05	6/5/2022	911.95	74.21	837.74
DC-05	9/12/2022	911.95	73.95	838.00
DC-05	12/5/2022	911.95	71.45	840.50
DC-05	3/5/2023	911.95	73.70	838.25
DC-05	6/4/2023	911.95	75.21	836.74
DC-05	9/10/2023	911.95	75.09	836.86
DC-05	12/3/2023	911.95	73.90	838.05

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
DC-05D	9/16/2013	915.91	71.92	843.99
DC-05D	12/9/2013	915.91	72.04	843.87
DC-05D	3/16/2014	915.91	73.83	842.08
DC-05D	6/1/2014	915.91	74.80	841.11
DC-05D	9/21/2014	915.91	73.78	842.13
DC-05D	12/14/2014	915.91	73.02	842.89
DC-05D	3/5/2015	915.91	73.66	842.25
DC-05D	6/15/2015	915.91	74.71	841.20
DC-05D	9/21/2015	915.91	74.38	841.53
DC-05D	12/13/2015	915.91	73.88	842.03
DC-05D	3/8/2016	915.91	74.70	841.21
DC-05D	6/19/2016	915.91	75.71	840.20
DC-05D	9/25/2016	915.91	75.40	840.51
DC-05D	12/11/2016	915.91	74.65	841.26
DC-05D	3/5/2017	915.91	74.96	840.95
DC-05D	6/4/2017	915.91	75.94	839.97
DC-05D	9/27/2017	915.91	75.47	840.44
DC-05D	12/3/2017	915.91	74.64	841.27
DC-05D	3/18/2018	915.91	75.43	840.48
DC-05D	6/3/2018	915.91	75.46	840.45
DC-05D	9/8/2018	915.91	75.54	840.37
DC-05D	12/9/2018	915.91	75.00	840.91
DC-05D	3/21/2019	915.91	75.30	840.61
DC-05D	6/1/2019	915.91	76.26	839.65
DC-05D	9/8/2019	915.91	76.17	839.74
DC-05D	12/8/2019	915.91	75.37	840.54
DC-05D	3/29/2020	915.91	76.38	839.53
DC-05D	6/7/2020	915.91	77.36	838.55
DC-05D	9/20/2020	915.91	77.85	838.06
DC-05D	12/6/2020	915.91	77.21	838.70
DC-05D	2/28/2021	915.91	78.68	837.23
DC-05D	6/6/2021	915.91	79.28	836.63
DC-05D	9/20/2021	915.91	79.44	836.47
DC-05D	12/14/2021	915.91	78.26	837.65
DC-05D	3/14/2022	915.91	78.28	837.63
DC-05D	6/5/2022	915.91	77.36	838.55
DC-05D	9/12/2022	915.91	76.52	839.39
DC-05D	12/5/2022	915.91	71.99	843.92
DC-05D	3/5/2023	915.91	77.39	838.52
DC-05D	6/4/2023	915.91	78.91	837.00
DC-05D	9/10/2023	915.91	78.65	837.26
DC-05D	12/3/2023	915.91	77.55	838.36

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
DC-07	9/16/2013	889.29	44.76	844.53
DC-07	12/9/2013	889.29	44.15	845.14
DC-07	3/16/2014	889.29	44.76	844.53
DC-07	6/1/2014	889.29	35.12	---[1]
DC-07	9/21/2014	889.29	44.59	844.70
DC-07	12/14/2014	889.29	44.13	845.16
DC-07	3/5/2015	889.29	44.90	844.39
DC-07	6/15/2015	889.29	45.30	843.99
DC-07	9/21/2015	889.29	45.08	844.21
DC-07	12/13/2015	889.29	44.65	844.64
DC-07	3/8/2016	889.29	45.50	843.79
DC-07	6/19/2016	889.29	46.16	843.13
DC-07	9/25/2016	889.29	45.69	843.60
DC-07	12/11/2016	889.29	45.61	843.68
DC-07	3/5/2017	889.29	46.27	843.02
DC-07	6/4/2017	889.29	46.54	842.75
DC-07	9/27/2017	889.29	46.11	843.18
DC-07	12/3/2017	889.29	45.73	843.56
DC-07	3/18/2018	889.29	46.45	842.84
DC-07	6/3/2018	889.29	46.76	842.53
DC-07	9/8/2018	889.29	46.32	842.97
DC-07	12/9/2018	889.29	46.09	843.20
DC-07	3/21/2019	889.29	46.94	842.35
DC-07	6/1/2019	889.29	47.36	841.93
DC-07	9/8/2019	889.29	46.79	842.50
DC-07	12/8/2019	889.29	46.68	842.61
DC-07	3/29/2020	889.29	47.65	841.64
DC-07	6/7/2020	889.29	48.04	841.25
DC-07	7/13/2020	889.29	48.06	841.23
DC-07	9/20/2020	889.29	47.80	841.49
DC-07	12/6/2020	889.29	47.51	841.78
DC-07	2/28/2021	889.29	48.12	841.17
DC-07	6/6/2021	889.29	48.69	840.60
DC-07	9/20/2021	889.29	48.17	841.12
DC-07	12/14/2021	889.29	48.05	841.24
DC-07	3/14/2022	889.29	48.81	840.48
DC-07	6/5/2022	889.29	49.25	840.04
DC-07	9/12/2022	889.29	49.03	840.26
DC-07	12/5/2022	889.29	48.57	840.72
DC-07	3/5/2023	889.29	49.70	839.59
DC-07	6/4/2023	889.29	49.98	839.31
DC-07	9/10/2023	889.29	49.80	839.49
DC-07	12/3/2023	889.29	49.24	840.05

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
DC-09	9/16/2013	1048.60	147.16	901.44
DC-09	12/9/2013	1048.60	143.10	905.50
DC-09	3/16/2014	1048.60	139.81	908.79
DC-09	6/1/2014	1048.60	142.53	906.07
DC-09	9/21/2014	1048.60	143.67	904.93
DC-09	12/14/2014	1048.60	139.42	909.18
DC-09	3/5/2015	1048.60	137.83	910.77
DC-09	6/15/2015	1048.60	146.33	902.27
DC-09	9/21/2015	1048.60	151.28	897.32
DC-09	12/13/2015	1048.60	147.46	901.14
DC-09	3/8/2016	1048.60	146.70	901.90
DC-09	6/19/2016	1048.60	151.03	897.57
DC-09	9/25/2016	1048.60	151.98	896.62
DC-09	12/11/2016	1048.60	148.71	899.89
DC-09	3/5/2017	1048.60	146.24	902.36
DC-09	6/4/2017	1048.60	148.62	899.98
DC-09	9/27/2017	1048.60	151.56	897.04
DC-09	12/3/2017	1048.60	149.27	899.33
DC-09	3/18/2018	1048.60	146.19	902.41
DC-09	6/3/2018	1048.60	149.27	899.33
DC-09	9/8/2018	1048.60	151.66	896.94
DC-09	12/9/2018	1048.60	149.99	898.61
DC-09	3/21/2019	1048.60	148.87	899.73
DC-09	6/1/2019	1048.60	151.32	897.28
DC-09	9/8/2019	1048.60	155.69	892.91
DC-09	12/8/2019	1048.60	155.23	893.37
DC-09	3/29/2020	1048.60	156.53	892.07
DC-09	6/7/2020	1048.60	157.91	890.69
DC-09	9/20/2020	1048.60	161.02	887.58
DC-09	12/6/2020	1048.60	160.56	888.04
DC-09	2/28/2021	1048.60	159.29	889.31
DC-09	6/6/2021	1048.60	161.68	886.92
DC-09	9/20/2021	1048.60	164.74	883.86
DC-09	12/14/2021	1048.60	163.15	885.45
DC-09	3/14/2022	1048.60	162.89	885.71
DC-09	6/5/2022	1048.60	164.10	884.50
DC-09	9/12/2022	1048.60	166.79	881.81
DC-09	12/5/2022	1048.60	165.30	883.30
DC-09	3/5/2023	1048.60	163.17	885.43
DC-09	6/4/2023	1048.60	164.23	884.37
DC-09	9/10/2023	1048.60	166.75	881.85
DC-09	12/3/2023	1048.60	164.52	884.08

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
DC-14	9/16/2013	1036.61	131.08	905.53
DC-14	12/9/2013	1036.61	131.10	905.51
DC-14	3/16/2014	1036.61	130.32	906.29
DC-14	6/1/2014	1036.61	130.02	906.59
DC-14	9/21/2014	1036.61	130.25	906.36
DC-14	12/14/2014	1036.61	137.91	---[1]
DC-14	3/5/2015	1036.61	129.51	907.10
DC-14	6/15/2015	1036.61	129.37	907.24
DC-14	9/21/2015	1036.61	130.28	906.33
DC-14	12/13/2015	1036.61	130.71	905.90
DC-14	3/8/2016	1036.61	131.26	905.35
DC-14	6/19/2016	1036.61	131.89	904.72
DC-14	9/25/2016	1036.61	132.76	903.85
DC-14	12/11/2016	1036.61	133.45	903.16
DC-14	3/5/2017	1036.61	133.81	902.80
DC-14	6/4/2017	1036.61	133.81	902.80
DC-14	9/27/2017	1036.61	134.16	902.45
DC-14	12/3/2017	1036.61	134.48	902.13
DC-14	3/18/2018	1036.61	133.83	902.78
DC-14	6/3/2018	1036.61	133.35	903.26
DC-14	9/8/2018	1036.61	133.67	902.94
DC-14	12/9/2018	1036.61	133.67	902.94
DC-14	3/21/2019	1036.61	133.24	903.37
DC-14	6/1/2019	1036.61	132.98	903.63
DC-14	9/8/2019	1036.61	133.72	902.89
DC-14	12/8/2019	1036.61	134.60	902.01
DC-14	3/29/2020	1036.61	135.10	901.51
DC-14	6/7/2020	1036.61	135.56	901.05
DC-14	9/20/2020	1036.61	136.54	900.07
DC-14	12/6/2020	1036.61	137.45	899.16
DC-14	2/28/2021	1036.61	138.02	898.59
DC-14	6/6/2021	1036.61	138.28	898.33
DC-14	9/20/2021	1036.61	139.06	897.55
DC-14	12/14/2021	1036.61	139.58	897.03
DC-14	3/14/2022	1036.61	139.27	897.34
DC-14	6/5/2022	1036.61	139.03	897.58
DC-14	9/12/2022	1036.61	139.70	896.91
DC-14	12/5/2022	1036.61	139.84	896.77
DC-14	3/5/2023	1036.61	139.67	896.94
DC-14	6/4/2023	1036.61	139.12	897.49
DC-14	9/10/2023	1036.61	139.35	897.26
DC-14	12/3/2023	1036.61	139.55	897.06

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-02	9/16/2013	1288.97	24.21	1264.76
YVD-02	12/9/2013	1288.97	32.85	1256.12
YVD-02	3/16/2014	1288.97	34.45	1254.52
YVD-02	6/1/2014	1288.97	22.10	1266.87
YVD-02	9/21/2014	1288.97	26.14	1262.83
YVD-02	12/14/2014	1288.97	33.01	1255.96
YVD-02	3/5/2015	1288.97	34.42	1254.55
YVD-02	6/15/2015	1288.97	19.69	1269.28
YVD-02	9/21/2015	1288.97	25.36	1263.61
YVD-02	12/13/2015	1288.97	33.25	1255.72
YVD-02	3/8/2016	1288.97	33.93	1255.04
YVD-02	6/19/2016	1288.97	27.49	1261.48
YVD-02	9/25/2016	1288.97	27.72	1261.25
YVD-02	12/11/2016	1288.97	32.52	1256.45
YVD-02	3/5/2017	1288.97	27.34	1261.63
YVD-02	6/4/2017	1288.97	26.97	1262.00
YVD-02	9/27/2017	1288.97	28.08	1260.89
YVD-02	12/3/2017	1288.97	33.83	1255.14
YVD-02	3/18/2018	1288.97	34.07	1254.90
YVD-02	6/3/2018	1288.97	33.78	1255.19
YVD-02	9/8/2018	1288.97	29.19	1259.78
YVD-02	12/9/2018	1288.97	33.17	1255.80
YVD-02	3/21/2019	1288.97	34.44	1254.53
YVD-02	6/1/2019	1288.97	30.68	1258.29
YVD-02	9/8/2019	1288.97	32.34	1256.63
YVD-02	12/8/2019	1288.97	33.92	1255.05
YVD-02	3/29/2020	1288.97	35.49	1253.48
YVD-02	6/7/2020	1288.97	37.44	1251.53
YVD-02	7/13/2020	1288.97	37.68	1251.29
YVD-02	9/19/2020	1288.97	37.94	1251.03
YVD-02	12/6/2020	1288.97	Dry	---
YVD-02	2/28/2021	1288.97	37.93	1251.04
YVD-02	6/6/2021	1288.97	Dry	---
YVD-02	9/20/2021	1288.97	Dry	---
YVD-02	12/14/2021	1288.97	Dry	---
YVD-02	3/14/2022	1288.97	Dry	---
YVD-02	6/5/2022	1288.97	Dry	---
YVD-02	9/12/2022	1288.97	Dry	---
YVD-02	12/5/2022	1288.97	Dry	---
YVD-02	3/5/2023	1288.97	Dry	---
YVD-02	6/4/2023	1288.97	Dry	---
YVD-02	9/10/2023	1288.97	Dry	---
YVD-02	12/3/2023	1288.97	Dry	---

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-03	9/16/2013	1120.68	189.88	930.80
YVD-03	12/9/2013	1120.68	190.42	930.26
YVD-03	3/16/2014	1120.68	189.10	931.58
YVD-03	6/1/2014	1120.68	188.97	931.71
YVD-03	9/21/2014	1120.68	189.04	931.64
YVD-03	12/14/2014	1120.68	188.73	931.95
YVD-03	3/5/2015	1120.68	187.92	932.76
YVD-03	6/15/2015	1120.68	188.70	931.98
YVD-03	9/21/2015	1120.68	189.63	931.05
YVD-03	12/13/2015	1120.68	189.85	930.83
YVD-03	3/8/2016	1120.68	190.64	930.04
YVD-03	6/19/2016	1120.68	191.31	929.37
YVD-03	9/25/2016	1120.68	191.61	929.07
YVD-03	12/11/2016	1120.68	191.25	929.43
YVD-03	3/5/2017	1120.68	190.85	929.83
YVD-03	6/4/2017	1120.68	191.20	929.48
YVD-03	9/27/2017	1120.68	191.77	928.91
YVD-03	12/3/2017	1120.68	191.61	929.07
YVD-03	3/18/2018	1120.68	191.55	929.13
YVD-03	6/3/2018	1120.68	191.40	929.28
YVD-03	9/8/2018	1120.68	191.96	928.72
YVD-03	12/9/2018	1120.68	192.59	928.09
YVD-03	3/21/2019	1120.68	191.86	928.82
YVD-03	6/1/2019	1120.68	191.85	928.83
YVD-03	9/8/2019	1120.68	192.53	928.15
YVD-03	12/8/2019	1120.68	193.62	927.06
YVD-03	3/29/2020	1120.68	193.93	926.75
YVD-03	6/7/2020	1120.68	194.17	926.51
YVD-03	9/20/2020	1120.68	195.07	925.61
YVD-03	11/19/2020	1120.68	195.78	924.90
YVD-03	12/6/2020	1120.68	195.75	924.93
YVD-03	2/28/2021	1120.68	195.80	924.88
YVD-03	6/6/2021	1120.68	195.50	925.18
YVD-03	9/20/2021	1120.68	196.18	924.50
YVD-03	12/14/2021	1120.68	195.94	924.74
YVD-03	3/14/2022	1120.68	196.42	924.26
YVD-03	6/5/2022	1120.68	196.15	924.53
YVD-03	9/12/2022	1120.68	197.06	923.62
YVD-03	12/5/2022	1120.68	197.11	923.57
YVD-03	3/5/2023	1120.68	197.05	923.63
YVD-03	6/4/2023	1120.68	197.29	923.39
YVD-03	9/10/2023	1120.68	197.62	923.06
YVD-03	12/3/2023	1120.68	197.24	923.44

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-04	9/16/2013	1118.66	220.55	898.11
YVD-04	12/9/2013	1118.66	223.50	895.16
YVD-04	3/16/2014	1118.66	222.20	896.46
YVD-04	6/1/2014	1118.66	221.04	897.62
YVD-04	9/21/2014	1118.66	220.67	897.99
YVD-04	12/14/2014	1118.66	221.30	897.36
YVD-04	3/5/2015	1118.66	220.72	897.94
YVD-04	6/15/2015	1118.66	221.61	897.05
YVD-04	9/21/2015	1118.66	221.99	896.67
YVD-04	12/13/2015	1118.66	221.71	896.95
YVD-04	3/8/2016	1118.66	220.74	897.92
YVD-04	6/19/2016	1118.66	221.50	897.16
YVD-04	9/25/2016	1118.66	221.05	897.61
YVD-04	12/11/2016	1118.66	221.07	897.59
YVD-04	3/5/2017	1118.66	220.89	897.77
YVD-04	6/4/2017	1118.66	221.83	896.83
YVD-04	9/27/2017	1118.66	222.49	896.17
YVD-04	12/3/2017	1118.66	222.38	896.28
YVD-04	3/18/2018	1118.66	222.37	896.29
YVD-04	6/3/2018	1118.66	222.04	896.62
YVD-04	9/8/2018	1118.66	222.29	896.37
YVD-04	12/9/2018	1118.66	222.36	896.30
YVD-04	3/21/2019	1118.66	221.67	896.99
YVD-04	6/1/2019	1118.66	221.71	896.95
YVD-04	9/8/2019	1118.66	222.06	896.60
YVD-04	12/8/2019	1118.66	222.31	896.35
YVD-04	3/29/2020	1118.66	222.47	896.19
YVD-04	6/7/2020	1118.66	222.76	895.90
YVD-04	9/20/2020	1118.66	223.52	895.14
YVD-04	12/6/2020	1118.66	224.24	894.42
YVD-04	2/28/2021	1118.66	224.39	894.27
YVD-04	6/6/2021	1118.66	224.48	894.18
YVD-04	9/20/2021	1118.66	225.71	892.95
YVD-04	12/14/2021	1118.66	225.63	893.03
YVD-04	3/14/2022	1118.66	226.81	891.85
YVD-04	6/5/2022	1118.66	227.54	891.12
YVD-04	9/12/2022	1118.66	229.62	889.04
YVD-04	12/5/2022	1118.66	230.28	888.38
YVD-04	3/5/2023	1118.66	230.47	888.19
YVD-04	6/4/2023	1118.66	231.28	887.38
YVD-04	9/10/2023	1118.66	231.89	886.77
YVD-04	12/3/2023	1118.66	231.61	887.05

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-05	9/16/2013	1051.78	167.50	884.28
YVD-05	12/9/2013	1051.78	166.35	885.43
YVD-05	3/16/2014	1051.78	165.40	886.38
YVD-05	6/1/2014	1051.78	165.58	886.20
YVD-05	9/21/2014	1051.78	166.01	885.77
YVD-05	12/14/2014	1051.78	165.35	886.43
YVD-05	3/5/2015	1051.78	164.86	886.92
YVD-05	6/15/2015	1051.78	166.04	885.74
YVD-05	9/21/2015	1051.78	168.04	883.74
YVD-05	12/13/2015	1051.78	167.75	884.03
YVD-05	3/8/2016	1051.78	167.71	884.07
YVD-05	6/19/2016	1051.78	168.45	883.33
YVD-05	9/25/2016	1051.78	168.97	882.81
YVD-05	12/11/2016	1051.78	168.51	883.27
YVD-05	3/5/2017	1051.78	167.98	883.80
YVD-05	6/4/2017	1051.78	168.07	883.71
YVD-05	9/27/2017	1051.78	169.83	881.95
YVD-05	12/3/2017	1051.78	169.67	882.11
YVD-05	3/18/2018	1051.78	169.38	882.40
YVD-05	6/3/2018	1051.78	169.45	882.33
YVD-05	9/8/2018	1051.78	169.85	881.93
YVD-05	12/9/2018	1051.78	169.44	882.34
YVD-05	3/21/2019	1051.78	168.86	882.92
YVD-05	6/1/2019	1051.78	169.06	882.72
YVD-05	9/8/2019	1051.78	170.22	881.56
YVD-05	12/8/2019	1051.78	170.62	881.16
YVD-05	3/29/2020	1051.78	171.06	880.72
YVD-05	6/7/2020	1051.78	171.58	880.20
YVD-05	9/20/2020	1051.78	172.53	879.25
YVD-05	12/6/2020	1051.78	172.95	878.83
YVD-05	2/28/2021	1051.78	173.05	878.73
YVD-05	6/6/2021	1051.78	173.39	878.39
YVD-05	9/20/2021	1051.78	NM[2]	---
YVD-05	12/14/2021	1051.78	174.20	877.58
YVD-05	3/14/2022	1051.78	174.19	877.59
YVD-05	6/5/2022	1051.78	174.32	877.46
YVD-05	9/12/2022	1051.78	175.22	876.56
YVD-05	12/5/2022	1051.78	175.35	876.43
YVD-05	3/5/2023	1051.78	175.05	876.73
YVD-05	6/4/2023	1051.78	175.15	876.63
YVD-05	9/10/2023	1051.78	175.25	876.53
YVD-05	12/3/2023	1051.78	175.35	876.43

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-06	9/16/2013	1053.51	110.65	942.86
YVD-06	12/9/2013	1053.51	108.21	945.30
YVD-06	3/16/2014	1053.51	105.98	947.53
YVD-06	6/1/2014	1053.51	106.49	947.02
YVD-06	9/21/2014	1053.51	108.02	945.49
YVD-06	12/14/2014	1053.51	106.32	947.19
YVD-06	3/5/2015	1053.51	104.68	948.83
YVD-06	6/15/2015	1053.51	106.37	947.14
YVD-06	9/21/2015	1053.51	109.01	944.50
YVD-06	12/13/2015	1053.51	108.72	944.79
YVD-06	3/8/2016	1053.51	108.90	944.61
YVD-06	6/19/2016	1053.51	111.03	942.48
YVD-06	9/25/2016	1053.51	112.05	941.46
YVD-06	12/15/2016	1053.51	109.70	943.81
YVD-06	3/5/2017	1053.51	107.89	945.62
YVD-06	6/4/2017	1053.51	109.14	944.37
YVD-06	9/27/2017	1053.51	110.99	942.52
YVD-06	12/3/2017	1053.51	109.30	944.21
YVD-06	3/18/2018	1053.51	106.37	947.14
YVD-06	6/3/2018	1053.51	108.02	945.49
YVD-06	9/8/2018	1053.51	109.87	943.64
YVD-06	12/9/2018	1053.51	107.99	945.52
YVD-06	3/21/2019	1053.51	106.86	946.65
YVD-06	6/1/2019	1053.51	108.32	945.19
YVD-06	9/8/2019	1053.51	110.95	942.56
YVD-06	12/8/2019	1053.51	111.11	942.40
YVD-06	3/29/2020	1053.51	110.92	942.59
YVD-06	6/7/2020	1053.51	112.14	941.37
YVD-06	9/20/2020	1053.51	113.89	939.62
YVD-06	12/6/2020	1053.51	113.00	940.51
YVD-06	2/28/2021	1053.51	111.71	941.80
YVD-06	6/6/2021	1053.51	112.36	941.15
YVD-06	9/20/2021	1053.51	113.89	939.62
YVD-06	12/14/2021	1053.51	111.58	941.93
YVD-06	3/14/2022	1053.51	110.29	943.22
YVD-06	6/5/2022	1053.51	111.01	942.50
YVD-06	9/12/2022	1053.51	112.62	940.89
YVD-06	12/5/2022	1053.51	111.18	942.33
YVD-06	3/5/2023	1053.51	109.35	944.16
YVD-06	6/4/2023	1053.51	110.20	943.31
YVD-06	9/10/2023	1053.51	111.42	942.09
YVD-06	12/3/2023	1053.51	109.98	943.53

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-07	9/16/2013	1073.03	157.99	915.04
YVD-07	12/9/2013	1073.03	157.26	915.77
YVD-07	3/16/2014	1073.03	153.95	919.08
YVD-07	6/1/2014	1073.03	153.87	919.16
YVD-07	9/21/2014	1073.03	155.93	917.10
YVD-07	12/14/2014	1073.03	155.40	917.63
YVD-07	3/5/2015	1073.03	153.42	919.61
YVD-07	6/15/2015	1073.03	154.30	918.73
YVD-07	9/21/2015	1073.03	157.09	915.94
YVD-07	12/13/2015	1073.03	158.05	914.98
YVD-07	3/8/2016	1073.03	157.96	915.07
YVD-07	6/19/2016	1073.03	158.75	914.28
YVD-07	9/25/2016	1073.03	160.29	912.74
YVD-07	12/11/2016	1073.03	160.00	913.03
YVD-07	3/5/2017	1073.03	157.59	915.44
YVD-07	6/4/2017	1073.03	157.56	915.47
YVD-07	9/27/2017	1073.03	159.81	913.22
YVD-07	12/3/2017	1073.03	159.30	913.73
YVD-07	3/18/2018	1073.03	156.76	916.27
YVD-07	6/3/2018	1073.03	156.44	916.59
YVD-07	9/8/2018	1073.03	158.22	914.81
YVD-07	12/9/2018	1073.03	158.27	914.76
YVD-07	3/21/2019	1073.03	156.58	916.45
YVD-07	6/1/2019	1073.03	157.05	915.98
YVD-07	9/8/2019	1073.03	159.06	913.97
YVD-07	12/8/2019	1073.03	160.48	912.55
YVD-07	3/29/2020	1073.03	159.62	913.41
YVD-07	6/7/2020	1073.03	160.42	912.61
YVD-07	9/20/2020	1073.03	162.61	910.42
YVD-07	12/6/2020	1073.03	164.10	908.93
YVD-07	2/28/2021	1073.03	162.27	910.76
YVD-07	6/6/2021	1073.03	161.15	911.88
YVD-07	9/20/2021	1073.03	163.83	909.20
YVD-07	12/14/2021	1073.03	163.66	909.37
YVD-07	3/14/2022	1073.03	159.94	913.09
YVD-07	6/5/2022	1073.03	159.47	913.56
YVD-07	9/12/2022	1073.03	161.24	911.79
YVD-07	12/5/2022	1073.03	161.72	911.31
YVD-07	3/5/2023	1073.03	158.98	914.05
YVD-07	6/4/2023	1073.03	158.18	914.85
YVD-07	9/10/2023	1073.03	159.44	913.59
YVD-07	12/3/2023	1073.03	159.78	913.25

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-08	9/16/2013	1014.38	170.83	843.55
YVD-08	12/9/2013	1014.38	171.08	843.30
YVD-08	3/16/2014	1014.38	170.66	843.72
YVD-08	6/1/2014	1014.38	170.50	843.88
YVD-08	9/21/2014	1014.38	170.50	843.88
YVD-08	12/14/2014	1014.38	170.22	844.16
YVD-08	3/5/2015	1014.38	169.83	844.55
YVD-08	6/15/2015	1014.38	170.13	844.25
YVD-08	9/21/2015	1014.38	170.67	843.71
YVD-08	12/13/2015	1014.38	170.63	843.75
YVD-08	3/8/2016	1014.38	171.00	843.38
YVD-08	6/19/2016	1014.38	171.51	842.87
YVD-08	9/25/2016	1014.38	171.75	842.63
YVD-08	12/11/2016	1014.38	171.52	842.86
YVD-08	3/5/2017	1014.38	171.16	843.22
YVD-08	6/4/2017	1014.38	171.87	842.51
YVD-08	9/27/2017	1014.38	172.30	842.08
YVD-08	12/3/2017	1014.38	171.95	842.43
YVD-08	3/18/2018	1014.38	172.17	842.21
YVD-08	6/3/2018	1014.38	172.10	842.28
YVD-08	9/8/2018	1014.38	172.36	842.02
YVD-08	12/9/2018	1014.38	172.39	841.99
YVD-08	3/21/2019	1014.38	172.03	842.35
YVD-08	6/1/2019	1014.38	172.39	841.99
YVD-08	9/8/2019	1014.38	172.56	841.82
YVD-08	12/8/2019	1014.38	172.73	841.65
YVD-08	3/29/2020	1014.38	172.66	841.72
YVD-08	6/7/2020	1014.38	172.87	841.51
YVD-08	9/20/2020	1014.38	173.33	841.05
YVD-08	12/6/2020	1014.38	173.75	840.63
YVD-08	2/28/2021	1014.38	173.87	840.51
YVD-08	6/6/2021	1014.38	173.75	840.63
YVD-08	9/20/2021	1014.38	174.58	839.80
YVD-08	12/14/2021	1014.38	174.37	840.01
YVD-08	3/14/2022	1014.38	174.83	839.55
YVD-08	6/5/2022	1014.38	174.85	839.53
YVD-08	9/12/2022	1014.38	175.64	838.74
YVD-08	12/5/2022	1014.38	175.88	838.50
YVD-08	3/5/2023	1014.38	176.02	838.36
YVD-08	6/4/2023	1014.38	176.44	837.94
YVD-08	9/10/2023	1014.38	176.78	837.60
YVD-08	12/3/2023	1014.38	176.74	837.64

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-09	9/16/2013	966.81	111.14	855.67
YVD-09	12/9/2013	966.81	109.93	856.88
YVD-09	3/16/2014	966.81	109.65	857.16
YVD-09	6/1/2014	966.81	109.95	856.86
YVD-09	9/21/2014	966.81	110.08	856.73
YVD-09	12/14/2014	966.81	109.90	856.91
YVD-09	3/5/2015	966.81	109.95	856.86
YVD-09	6/15/2015	966.81	110.35	856.46
YVD-09	9/21/2015	966.81	110.83	855.98
YVD-09	12/13/2015	966.81	110.89	855.92
YVD-09	3/8/2016	966.81	111.16	855.65
YVD-09	6/19/2016	966.81	111.41	855.40
YVD-09	9/25/2016	966.81	111.68	855.13
YVD-09	12/11/2016	966.81	111.84	854.97
YVD-09	3/5/2017	966.81	111.92	854.89
YVD-09	6/4/2017	966.81	112.29	854.52
YVD-09	9/27/2017	966.81	112.50	854.31
YVD-09	12/3/2017	966.81	112.59	854.22
YVD-09	3/18/2018	966.81	112.56	854.25
YVD-09	6/3/2018	966.81	112.28	854.53
YVD-09	9/8/2018	966.81	112.19	854.62
YVD-09	12/9/2018	966.81	111.77	855.04
YVD-09	3/21/2019	966.81	111.78	855.03
YVD-09	6/1/2019	966.81	112.03	854.78
YVD-09	9/8/2019	966.81	112.37	854.44
YVD-09	12/8/2019	966.81	112.55	854.26
YVD-09	3/29/2020	966.81	112.60	854.21
YVD-09	6/7/2020	966.81	112.92	853.89
YVD-09	9/20/2020	966.81	113.29	853.52
YVD-09	12/6/2020	966.81	113.55	853.26
YVD-09	2/28/2021	966.81	113.63	853.18
YVD-09	6/6/2021	966.81	113.80	853.01
YVD-09	9/20/2021	966.81	114.41	852.40
YVD-09	12/14/2021	966.81	114.66	852.15
YVD-09	3/14/2022	966.81	114.54	852.27
YVD-09	6/5/2022	966.81	114.70	852.11
YVD-09	9/12/2022	966.81	115.22	851.59
YVD-09	12/5/2022	966.81	115.16	851.65
YVD-09	3/5/2023	966.81	115.21	851.60
YVD-09	6/4/2023	966.81	115.33	851.48
YVD-09	9/10/2023	966.81	115.56	851.25
YVD-09	12/3/2023	966.81	115.67	851.14

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-10	9/16/2013	958.00	90.04	867.96
YVD-10	12/9/2013	958.00	89.20	868.80
YVD-10	3/16/2014	958.00	89.39	868.61
YVD-10	6/1/2014	958.00	90.35	867.65
YVD-10	9/21/2014	958.00	90.41	867.59
YVD-10	12/14/2014	958.00	88.76	869.24
YVD-10	3/5/2015	958.00	89.90	868.10
YVD-10	6/15/2015	958.00	91.10	866.90
YVD-10	9/21/2015	958.00	91.85	866.15
YVD-10	12/13/2015	958.00	91.52	866.48
YVD-10	3/8/2016	958.00	91.91	866.09
YVD-10	6/19/2016	958.00	92.92	865.08
YVD-10	9/25/2016	958.00	92.99	865.01
YVD-10	12/11/2016	958.00	93.02	864.98
YVD-10	3/5/2017	958.00	93.24	864.76
YVD-10	6/4/2017	958.00	93.70	864.30
YVD-10	9/27/2017	958.00	93.39	864.61
YVD-10	12/3/2017	958.00	92.86	865.14
YVD-10	3/18/2018	958.00	92.49	865.51
YVD-10	6/3/2018	958.00	92.81	865.19
YVD-10	9/8/2018	958.00	93.35	864.65
YVD-10	12/9/2018	958.00	92.50	865.50
YVD-10	3/21/2019	958.00	92.36	865.64
YVD-10	6/1/2019	958.00	93.03	864.97
YVD-10	9/8/2019	958.00	93.67	864.33
YVD-10	12/8/2019	958.00	93.44	864.56
YVD-10	3/29/2020	958.00	94.06	863.94
YVD-10	6/7/2020	958.00	94.38	863.62
YVD-10	9/20/2020	958.00	94.92	863.08
YVD-10	12/6/2020	958.00	94.39	863.61
YVD-10	2/28/2021	958.00	94.67	863.33
YVD-10	6/6/2021	958.00	95.54	862.46
YVD-10	9/20/2021	958.00	95.88	862.12
YVD-10	12/14/2021	958.00	95.35	862.65
YVD-10	3/14/2022	958.00	95.06	862.94
YVD-10	6/5/2022	958.00	95.62	862.38
YVD-10	9/12/2022	958.00	96.37	861.63
YVD-10	12/5/2022	958.00	95.42	862.58
YVD-10	3/5/2023	958.00	95.26	862.74
YVD-10	6/4/2023	958.00	95.84	862.16
YVD-10	9/10/2023	958.00	96.20	861.80
YVD-10	12/3/2023	958.00	95.65	862.35

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-11	9/16/2013	967.91	106.03	861.88
YVD-11	12/9/2013	967.91	105.77	862.14
YVD-11	3/16/2014	967.91	105.72	862.19
YVD-11	6/1/2014	967.91	106.07	861.84
YVD-11	9/21/2014	967.91	106.04	861.87
YVD-11	12/14/2014	967.91	106.08	861.83
YVD-11	3/5/2015	967.91	106.18	861.73
YVD-11	6/15/2015	967.91	106.67	861.24
YVD-11	9/21/2015	967.91	106.52	861.39
YVD-11	12/13/2015	967.91	106.88	861.03
YVD-11	3/8/2016	967.91	107.58	860.33
YVD-11	6/19/2016	967.91	108.52	859.39
YVD-11	9/25/2016	967.91	108.95	858.96
YVD-11	12/11/2016	967.91	108.90	859.01
YVD-11	3/5/2017	967.91	109.08	858.83
YVD-11	6/4/2017	967.91	109.31	858.60
YVD-11	9/27/2017	967.91	108.75	859.16
YVD-11	12/3/2017	967.91	107.73	860.18
YVD-11	3/18/2018	967.91	108.10	859.81
YVD-11	6/3/2018	967.91	108.63	859.28
YVD-11	9/8/2018	967.91	108.97	858.94
YVD-11	12/9/2018	967.91	108.16	859.75
YVD-11	3/21/2019	967.91	108.58	859.33
YVD-11	6/1/2019	967.91	109.00	858.91
YVD-11	9/8/2019	967.91	109.58	858.33
YVD-11	12/8/2019	967.91	109.63	858.28
YVD-11	3/29/2020	967.91	110.09	857.82
YVD-11	6/7/2020	967.91	110.52	857.39
YVD-11	9/20/2020	967.91	111.12	856.79
YVD-11	12/6/2020	967.91	111.12	856.79
YVD-11	2/28/2021	967.91	111.24	856.67
YVD-11	6/6/2021	967.91	111.79	856.12
YVD-11	9/20/2021	967.91	111.94	855.97
YVD-11	12/14/2021	967.91	111.87	856.04
YVD-11	3/14/2022	967.91	112.00	855.91
YVD-11	6/5/2022	967.91	112.49	855.42
YVD-11	9/12/2022	967.91	111.92	855.99
YVD-11	12/5/2022	967.91	111.28	856.63
YVD-11	3/5/2023	967.91	111.52	856.39
YVD-11	6/4/2023	967.91	112.17	855.74
YVD-11	9/10/2023	967.91	112.18	855.73
YVD-11	12/3/2023	967.91	110.46	857.45

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-12	9/16/2013	961.91	138.50	823.41
YVD-12	12/9/2013	961.91	138.34	823.57
YVD-12	3/16/2014	961.91	137.55	824.36
YVD-12	6/1/2014	961.91	137.61	824.30
YVD-12	9/21/2014	961.91	137.45	824.46
YVD-12	12/14/2014	961.91	137.25	824.66
YVD-12	3/5/2015	961.91	136.52	825.39
YVD-12	6/15/2015	961.91	137.85	824.06
YVD-12	9/21/2015	961.91	138.95	822.96
YVD-12	12/13/2015	961.91	138.11	823.80
YVD-12	3/8/2016	961.91	138.26	823.65
YVD-12	6/19/2016	961.91	139.23	822.68
YVD-12	9/25/2016	961.91	139.13	822.78
YVD-12	12/11/2016	961.91	138.56	823.35
YVD-12	3/5/2017	961.91	138.02	823.89
YVD-12	6/4/2017	961.91	138.90	823.01
YVD-12	9/27/2017	961.91	139.05	822.86
YVD-12	12/3/2017	961.91	138.48	823.43
YVD-12	3/18/2018	961.91	138.46	823.45
YVD-12	6/3/2018	961.91	138.75	823.16
YVD-12	9/8/2018	961.91	139.15	822.76
YVD-12	12/9/2018	961.91	139.14	822.77
YVD-12	3/21/2019	961.91	138.69	823.22
YVD-12	6/1/2019	961.91	139.27	822.64
YVD-12	9/8/2019	961.91	139.67	822.24
YVD-12	12/8/2019	961.91	139.51	822.40
YVD-12	3/29/2020	961.91	139.82	822.09
YVD-12	6/7/2020	961.91	140.11	821.80
YVD-12	9/20/2020	961.91	140.51	821.40
YVD-12	12/6/2020	961.91	140.48	821.43
YVD-12	2/28/2021	961.91	140.39	821.52
YVD-12	6/6/2021	961.91	140.70	821.21
YVD-12	9/20/2021	961.91	141.51	820.40
YVD-12	12/14/2021	961.91	140.81	821.10
YVD-12	3/14/2022	961.91	141.28	820.63
YVD-12	6/5/2022	961.91	141.39	820.52
YVD-12	9/12/2022	961.91	142.17	819.74
YVD-12	12/5/2022	961.91	141.88	820.03
YVD-12	3/5/2023	961.91	141.76	820.15
YVD-12	6/4/2023	961.91	142.38	819.53
YVD-12	9/10/2023	961.91	142.72	819.19
YVD-12	12/3/2023	961.91	142.39	819.52

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-13	9/16/2013	965.59	127.43	838.16
YVD-13	12/9/2013	965.59	127.25	838.34
YVD-13	3/16/2014	965.59	127.58	838.01
YVD-13	6/1/2014	965.59	127.59	838.00
YVD-13	9/21/2014	965.59	127.29	838.30
YVD-13	12/14/2014	965.59	127.20	838.39
YVD-13	3/5/2015	965.59	127.35	838.24
YVD-13	6/15/2015	965.59	127.60	837.99
YVD-13	9/21/2015	965.59	127.36	838.23
YVD-13	12/13/2015	965.59	127.13	838.46
YVD-13	3/8/2016	965.59	127.87	837.72
YVD-13	6/19/2016	965.59	128.17	837.42
YVD-13	9/25/2016	965.59	127.88	837.71
YVD-13	12/11/2016	965.59	127.57	838.02
YVD-13	3/5/2017	965.59	127.92	837.67
YVD-13	6/4/2017	965.59	128.49	837.10
YVD-13	9/27/2017	965.59	128.05	837.54
YVD-13	12/3/2017	965.59	127.88	837.71
YVD-13	3/18/2018	965.59	128.47	837.12
YVD-13	6/3/2018	965.59	128.44	837.15
YVD-13	9/8/2018	965.59	128.28	837.31
YVD-13	12/9/2018	965.59	127.87	837.72
YVD-13	3/21/2019	965.59	128.46	837.13
YVD-13	6/1/2019	965.59	128.88	836.71
YVD-13	9/8/2019	965.59	128.62	836.97
YVD-13	12/8/2019	965.59	128.51	837.08
YVD-13	3/29/2020	965.59	129.09	836.50
YVD-13	6/7/2020	965.59	129.53	836.06
YVD-13	9/20/2020	965.59	129.32	836.27
YVD-13	12/6/2020	965.59	129.18	836.41
YVD-13	2/28/2021	965.59	129.66	835.93
YVD-13	6/6/2021	965.59	129.99	835.60
YVD-13	9/20/2021	965.59	130.05	835.54
YVD-13	12/14/2021	965.59	129.81	835.78
YVD-13	3/14/2022	965.59	130.36	835.23
YVD-13	6/5/2022	965.59	130.57	835.02
YVD-13	9/12/2022	965.59	130.70	834.89
YVD-13	12/5/2022	965.59	130.43	835.16
YVD-13	3/5/2023	965.59	131.16	834.43
YVD-13	6/4/2023	965.59	131.70	833.89
YVD-13	9/10/2023	965.59	131.62	833.97
YVD-13	12/3/2023	965.59	131.30	834.29

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-14	9/16/2013	920.19	77.30	842.89
YVD-14	12/9/2013	920.19	76.97	843.22
YVD-14	3/16/2014	920.19	77.45	842.74
YVD-14	6/1/2014	920.19	77.61	842.58
YVD-14	9/21/2014	920.19	77.28	842.91
YVD-14	12/14/2014	920.19	76.90	843.29
YVD-14	3/5/2015	920.19	77.51	842.68
YVD-14	6/17/2015	---	NM[3]	---
YVD-14	9/21/2015	---	NM[3]	---
YVD-14R	12/13/2015	921.41	77.76	843.65
YVD-14R	3/8/2016	921.41	78.53	842.88
YVD-14R	6/19/2016	921.41	79.03	842.38
YVD-14R	9/25/2016	921.41	78.68	842.73
YVD-14R	12/11/2016	921.41	78.57	842.84
YVD-14R	3/5/2017	921.41	79.14	842.27
YVD-14R	6/4/2017	921.41	79.53	841.88
YVD-14R	9/27/2017	921.41	78.93	842.48
YVD-14R	12/3/2017	921.41	78.72	842.69
YVD-14R	3/18/2018	921.41	79.40	842.01
YVD-14R	6/3/2018	921.41	79.35	842.06
YVD-14R	9/8/2018	921.41	79.26	842.15
YVD-14R	12/9/2018	921.41	78.93	842.48
YVD-14R	3/21/2019	921.41	79.75	841.66
YVD-14R	6/1/2019	921.41	80.14	841.27
YVD-14R	9/8/2019	921.41	79.74	841.67
YVD-14R	12/8/2019	921.41	79.60	841.81
YVD-14R	3/29/2020	921.41	80.46	840.95
YVD-14R	6/7/2020	921.41	80.83	840.58
YVD-14R	9/20/2020	921.41	80.55	840.86
YVD-14R	12/6/2020	921.41	80.38	841.03
YVD-14R	2/28/2021	921.41	80.92	840.49
YVD-14R	6/6/2021	921.41	81.41	840.00
YVD-14R	9/20/2021	921.41	81.13	840.28
YVD-14R	12/14/2021	921.41	80.95	840.46
YVD-14R	3/14/2022	921.41	81.65	839.76
YVD-14R	6/5/2022	921.41	82.01	839.40
YVD-14R	9/12/2022	921.41	81.91	839.50
YVD-14R	12/5/2022	921.41	81.58	839.83
YVD-14R	3/5/2023	921.41	82.37	839.04
YVD-14R	6/4/2023	921.41	82.86	838.55
YVD-14R	9/10/2023	921.41	82.65	838.76
YVD-14R	12/3/2023	921.41	82.23	839.18

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-15	9/16/2013	940.61	90.34	850.27
YVD-15	12/9/2013	940.61	90.49	850.12
YVD-15	3/16/2014	940.61	91.62	848.99
YVD-15	6/1/2014	940.61	92.57	848.04
YVD-15	9/21/2014	940.61	88.84	851.77
YVD-15	12/14/2014	940.61	90.56	850.05
YVD-15	3/5/2015	940.61	92.03	848.58
YVD-15	6/15/2015	940.61	93.22	847.39
YVD-15	9/21/2015	940.61	93.43	847.18
YVD-15	12/13/2015	940.61	93.21	847.40
YVD-15	3/8/2016	940.61	93.83	846.78
YVD-15	6/19/2016	940.61	94.70	845.91
YVD-15	9/25/2016	940.61	94.70	845.91
YVD-15	12/11/2016	940.61	94.44	846.17
YVD-15	3/5/2017	940.61	94.96	845.65
YVD-15	6/4/2017	940.61	95.52	845.09
YVD-15	9/27/2017	940.61	95.16	845.45
YVD-15	12/3/2017	940.61	94.74	845.87
YVD-15	3/18/2018	940.61	94.96	845.65
YVD-15	6/3/2018	940.61	95.32	845.29
YVD-15	9/8/2018	940.61	95.32	845.29
YVD-15	12/9/2018	940.61	94.79	845.82
YVD-15	3/21/2019	940.61	95.36	845.25
YVD-15	6/1/2019	940.61	95.83	844.78
YVD-15	9/8/2019	940.61	95.92	844.69
YVD-15	12/8/2019	940.61	95.55	845.06
YVD-15	3/29/2020	940.61	96.14	844.47
YVD-15	6/7/2020	940.61	96.58	844.03
YVD-15	9/20/2020	940.61	96.50	844.11
YVD-15	12/6/2020	940.61	95.96	844.65
YVD-15	2/28/2021	940.61	96.25	844.36
YVD-15	6/6/2021	940.61	96.97	843.64
YVD-15	9/20/2021	940.61	97.05	843.56
YVD-15	12/14/2021	940.61	96.53	844.08
YVD-15	3/14/2022	940.61	96.95	843.66
YVD-15	6/5/2022	940.61	97.51	843.10
YVD-15	9/12/2022	940.61	97.74	842.87
YVD-15	12/5/2022	940.61	96.95	843.66
YVD-15	3/5/2023	940.61	97.42	843.19
YVD-15	6/4/2023	940.61	98.05	842.56
YVD-15	9/10/2023	940.61	98.11	842.50
YVD-15	12/3/2023	940.61	97.37	843.24

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-16	9/16/2013	975.90	112.95	862.95
YVD-16	12/9/2013	975.90	112.84	863.06
YVD-16	3/16/2014	975.90	112.50	863.40
YVD-16	6/1/2014	975.90	112.62	863.28
YVD-16	9/21/2014	975.90	113.02	862.88
YVD-16	12/14/2014	975.90	112.86	863.04
YVD-16	3/5/2015	975.90	112.42	863.48
YVD-16	6/15/2015	975.90	112.85	863.05
YVD-16	9/21/2015	975.90	113.95	861.95
YVD-16	12/13/2015	975.90	114.04	861.86
YVD-16	3/8/2016	975.90	114.51	861.39
YVD-16	6/19/2016	975.90	115.18	860.72
YVD-16	9/25/2016	975.90	115.67	860.23
YVD-16	12/11/2016	975.90	115.17	860.73
YVD-16	3/5/2017	975.90	114.90	861.00
YVD-16	6/4/2017	975.90	115.51	860.39
YVD-16	9/27/2017	975.90	115.32	860.58
YVD-16	12/3/2017	975.90	114.86	861.04
YVD-16	3/18/2018	975.90	114.49	861.41
YVD-16	6/3/2018	975.90	114.62	861.28
YVD-16	9/8/2018	975.90	115.77	860.13
YVD-16	12/9/2018	975.90	115.57	860.33
YVD-16	3/21/2019	975.90	115.14	860.76
YVD-16	6/1/2019	975.90	115.72	860.18
YVD-16	9/8/2019	975.90	116.43	859.47
YVD-16	12/8/2019	975.90	116.71	859.19
YVD-16	3/29/2020	975.90	116.83	859.07
YVD-16	6/7/2020	975.90	117.34	858.56
YVD-16	9/20/2020	975.90	118.44	857.46
YVD-16	12/6/2020	975.90	118.68	857.22
YVD-16	2/28/2021	975.90	118.70	857.20
YVD-16	6/6/2021	975.90	118.88	857.02
YVD-16	9/20/2021	975.90	119.54	856.36
YVD-16	12/14/2021	975.90	119.34	856.56
YVD-16	3/14/2022	975.90	119.54	856.36
YVD-16	6/5/2022	975.90	119.79	856.11
YVD-16	9/12/2022	975.90	120.60	855.30
YVD-16	12/5/2022	975.90	120.48	855.42
YVD-16	3/5/2023	975.90	119.91	855.99
YVD-16	6/4/2023	975.90	120.48	855.42
YVD-16	9/10/2023	975.90	121.05	854.85
YVD-16	12/3/2023	975.90	120.97	854.93

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-17	9/16/2013	866.73	32.07	834.66
YVD-17	12/9/2013	866.73	34.81	831.92
YVD-17	3/16/2014	866.73	37.97	828.76
YVD-17	6/1/2014	866.73	35.50	831.23
YVD-17	9/21/2014	866.73	31.86	834.87
YVD-17	12/14/2014	866.73	34.74	831.99
YVD-17	3/5/2015	866.73	37.79	828.94
YVD-17	6/15/2015	866.73	34.57	832.16
YVD-17	9/21/2015	866.73	31.92	834.81
YVD-17	12/13/2015	866.73	35.16	831.57
YVD-17	3/8/2016	866.73	37.47	829.26
YVD-17	6/19/2016	866.73	35.37	831.36
YVD-17	9/25/2016	866.73	32.31	834.42
YVD-17	12/11/2016	866.73	35.20	831.53
YVD-17	3/5/2017	866.73	37.88	828.85
YVD-17	6/4/2017	866.73	36.13	830.60
YVD-17	9/27/2017	866.73	31.22	835.51
YVD-17	12/3/2017	866.73	34.65	832.08
YVD-17	3/18/2018	866.73	38.54	828.19
YVD-17	6/3/2018	866.73	36.20	830.53
YVD-17	9/8/2018	866.73	32.64	834.09
YVD-17	12/9/2018	866.73	35.42	831.31
YVD-17	3/21/2019	866.73	39.08	827.65
YVD-17	6/1/2019	866.73	37.30	829.43
YVD-17	9/9/2019	866.73	32.69	834.04
YVD-17	12/8/2019	866.73	35.95	830.78
YVD-17	3/29/2020	866.73	39.61	827.12
YVD-17	6/7/2020	866.73	36.93	829.80
YVD-17	9/20/2020	866.73	33.68	833.05
YVD-17	12/6/2020	866.73	36.31	830.42
YVD-17	2/28/2021	866.73	39.80	826.93
YVD-17	6/6/2021	866.73	37.82	828.91
YVD-17	9/20/2021	866.73	34.26	832.47
YVD-17	12/14/2021	866.73	37.37	829.36
YVD-17	3/14/2022	866.73	40.62	826.11
YVD-17	6/5/2022	866.73	38.57	828.16
YVD-17	9/12/2022	866.73	34.72	832.01
YVD-17	12/5/2022	866.73	37.42	829.31
YVD-17	3/5/2023	866.73	41.06	825.67
YVD-17	6/4/2023	866.73	39.70	827.03
YVD-17	9/10/2023	866.73	35.18	831.55
YVD-17	12/3/2023	866.73	37.56	829.17

Table 4
Historical Groundwater Elevations

Well ID	Date of Measurement	Reference Point Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)
YVD-18	9/16/2013	965.74	127.49	838.25
YVD-18	12/9/2013	965.74	127.45	838.29
YVD-18	3/16/2014	965.74	127.75	837.99
YVD-18	6/1/2014	965.74	127.69	838.05
YVD-18	9/21/2014	965.74	127.33	838.41
YVD-18	12/14/2014	965.74	127.33	838.41
YVD-18	3/5/2015	965.74	127.46	838.28
YVD-18	6/15/2015	965.74	127.71	838.03
YVD-18	9/21/2015	965.74	127.42	838.32
YVD-18	12/13/2015	965.74	127.24	838.50
YVD-18	3/8/2016	965.74	128.05	837.69
YVD-18	6/19/2016	965.74	128.29	837.45
YVD-18	9/25/2016	965.74	127.92	837.82
YVD-18	12/11/2016	965.74	127.66	838.08
YVD-18	3/5/2017	965.74	128.01	837.73
YVD-18	6/4/2017	965.74	128.54	837.20
YVD-18	9/27/2017	965.74	128.14	837.60
YVD-18	12/3/2017	965.74	127.95	837.79
YVD-18	3/18/2018	965.74	128.72	837.02
YVD-18	6/3/2018	965.74	128.48	837.26
YVD-18	9/8/2018	965.74	128.35	837.39
YVD-18	12/9/2018	965.74	128.00	837.74
YVD-18	3/21/2019	965.74	128.62	837.12
YVD-18	6/1/2019	965.74	129.04	836.70
YVD-18	9/8/2019	965.74	128.71	837.03
YVD-18	12/8/2019	965.74	128.63	837.11
YVD-18	3/29/2020	965.74	129.29	836.45
YVD-18	6/7/2020	965.74	129.67	836.07
YVD-18	9/20/2020	965.74	129.41	836.33
YVD-18	12/6/2020	965.74	129.32	836.42
YVD-18	2/28/2021	965.74	129.90	835.84
YVD-18	6/6/2021	965.74	130.11	835.63
YVD-18	9/20/2021	965.74	130.20	835.54
YVD-18	12/14/2021	965.74	129.97	835.77
YVD-18	3/14/2022	965.74	130.62	835.12
YVD-18	6/5/2022	965.74	130.74	835.00
YVD-18	9/12/2022	965.74	130.84	834.90
YVD-18	12/5/2022	965.74	130.56	835.18
YVD-18	3/5/2023	965.74	131.40	834.34
YVD-18	6/4/2023	965.74	131.89	833.85
YVD-18	9/10/2023	965.74	131.73	834.01
YVD-18	12/3/2023	965.74	131.52	834.22

Table 4
Historical Groundwater Elevations

Notes:

1. Anomalous water level measurement; omitted from dataset.

2. YVD-05 was covered with snow and ice and could not be located.

3. No well existed. YVD-14 was damaged and decommissioned during this time. YVD-14R was installed as a replacement.

---: no value or not applicable

BTOC: below top of casing

NAVD88: North American Vertical Datum of 1988

Table 5
Estimated Possible Average Linear Groundwater Flow Velocities – Fourth Quarter 2023

Material	Hydraulic Conductivity[1,2] [K] (feet per day)	Effective Porosity[3] [n_e]	K/n_e	Estimated Possible Average Linear Groundwater Flow Velocities [V_X] (feet per day)			
				Fourth Quarter 2023 Hydraulic Gradients			
				Site Average I[4]	Upslope I	Central I	Southern I
				0.0127	***0.0262***	***0.0108***	***0.0041***
Fine sand	53	0.33	161	2.0	4.2	1.7	0.7
Medium sand to fine gravel	131	0.32	409	5.2	10.7	4.4	1.7
Medium sand to coarse gravel	164	0.30	547	6.9	14.3	5.9	2.2
Fine gravel	267	0.28	954	12.1	25.0	10.3	3.9

Notes:

1. Hydraulic conductivities obtained from U.S. Environmental Protection Agency Method 9100, Saturated Hydraulic Conductivity, Saturated Leachate Conductivity, and Intrinsic Permeability, Chapter 6 – Properties; Publication SW-846: *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* ; 1986.
2. Hydraulic conductivities presented are for well-sorted (poorly graded) material.
3. Effective porosity obtained from *Data Collection Handbook to Support Modeling Impacts of Radioactive Material in Soil* ; Environmental Assessment and Information Sciences Division, Argonne National Laboratory; Argonne, Illinois; April 1993.
4. Hydraulic gradient [I] in feet per foot.

Table 6
Field Parameter Measurements – Fourth Quarter 2023

Well ID	Measurement Date	Bladder Pump Type (portable or dedicated)	Purge Time (minutes)	Volume Purged (liters)	Temperature (°C)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)	pH (Standard Units)	Oxidation/Reduction Potential (mV)	Turbidity (NTU)
DC-03	12/4/2023	Dedicated	18	3.6	12.9	6.43	2407	6.96	301.3	0.81
DC-03D	12/4/2023	Dedicated	21	3.7	12.6	1.28	1388	6.95	274.6	1.27
DC-04	12/4/2023	Dedicated	15	2.6	11.9	8.17	1349	7.10	307.7	0.80
DC-05	12/4/2023	Dedicated	15	2.4	11.8	7.69	1405	7.22	316.2	1.23
DC-05D	12/4/2023	Dedicated	21	3.6	12.2	7.80	753	7.64	291.8	1.94
DC-07	12/4/2023	Dedicated	15	2.6	12.8	0.29	1415	6.80	323.5	1.56
DC-14	12/6/2023	Dedicated	18	1.4	13.5	2.04	1685	6.66	243.1	0.76
YVD-02[1]	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
YVD-08	12/4/2023	Dedicated	57	5.6	13.0	6.17	1549	7.47	246.1	33.5
YVD-09	12/4/2023	Dedicated	21	3.2	14.3	5.27	1540	7.37	199.1	2.20
YVD-10	12/6/2023	Dedicated	21	3.4	12.7	6.60	2829	6.92	227.1	3.26
YVD-11	12/7/2023	Dedicated	15	3.5	12.6	6.87	1777	7.10	215.7	0.91
YVD-12	12/3/2023	Dedicated	15	3.9	14.7	6.92	1077	7.85	267.9	0.97
YVD-13	12/4/2023	Dedicated	18	1.5	11.3	6.85	1270	7.79	197.5	1.65
YVD-14R	12/4/2023	Dedicated	15	2.5	12.9	0.99	2405	6.80	311.7	0.54
YVD-15	12/6/2023	Dedicated	18	5.1	13.5	7.11	1009	7.38	227.2	0.58
YVD-16	12/4/2023	Dedicated	78	2.6	9.4	9.56	967	7.76	190.8	27.6
YVD-18	12/4/2023	Dedicated	30	3.3	13.6	9.72	1018	7.95	184.0	0.48

Notes:

1. Well dry during entire monitoring event.

°C: degrees Celsius

µS/cm: microsiemens per centimeter

mg/L: milligrams per liter

mV: millivolt

NS: not sampled

NTU: nephelometric turbidity unit

Table 7
Groundwater Analytical Results – Fourth Quarter 2023

				Analyte	Nitrate as Nitrogen		
				Analytical Method	EPA 300.0		
Well ID	Sample ID	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code
DC-03	YVD-120423-14	12/4/2023	N	K2313657	**137**	J	HTQ
DC-03D	YVD-120423-12	12/4/2023	N	K2313657	**36.9**	J	HTQ
DC-04	YVD-120423-08	12/4/2023	N	K2313548	**23.2**	--	--
DC-05	YVD-120423-04	12/4/2023	N	K2313548	**50.9**	--	--
DC-05	YVD-120423-06	12/4/2023	FD	K2313548	**50.9**	--	--
DC-05D	YVD-120423-02	12/4/2023	N	K2313548	**13.8**	--	--
DC-07	YVD-120423-10	12/4/2023	N	K2313548	**2.92**	--	--
DC-14	YVD-120623-04	12/6/2023	N	K2313796	**43.0**	J	HTQ
YVD-02	NS[1]	--	--	--	--	--	--
YVD-08	YVD-120423-03	12/4/2023	N	K2313548	**52.0**	--	--
YVD-09	YVD-120423-13	12/4/2023	N	K2313657	**66.9**	J	HTQ
YVD-10	YVD-120623-05	12/6/2023	N	K2313796	**64.3**	J	HTQ
YVD-11	YVD-120723-01	12/7/2023	N	K2313796	**72.4**	--	--
YVD-12	YVD-120323-01	12/3/2023	N	K2313548	**16.0**	J	HTQ
YVD-13	YVD-120423-09	12/4/2023	N	K2313657	**38.0**	J	HTQ
YVD-14R	YVD-120423-15	12/4/2023	N	K2313657	**111**	J	HTQ
YVD-15	YVD-120623-01	12/6/2023	N	K2313796	**14.0**	J	HTQ
YVD-15	YVD-120623-02	12/6/2023	FD	K2313796	**14.0**	J	HTQ
YVD-16	YVD-120423-07	12/4/2023	N	K2313548	**25.5**	J	HTQ
YVD-18	YVD-120423-11	12/4/2023	N	K2313657	**30.2**	J	HTQ

Notes:
1. Well YVD-02 was dry. No sample could be collected.
Bold: detected result
--: not applicable
(as N): reported as nitrogen
EPA: U.S. Environmental Protection Agency
FD: field duplicate
HTQ: Analysis completed outside of the designated holding time.
J: The compound was positively identified; however, the associated numerical value is an estimated concentration.
mg/L: milligrams per liter
N: normal sample
NS: not sampled

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			EPA 350.1			SM 4500 NH3--G			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-01	DC-01-130104	01/04/2013	N	EPA01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**9.80**	--	--
DC-01	DC-01-130924	09/24/2013	N	SWI0178	**110**	--	--	**110**	--	--	--	--	--	0.100	U	--	**88.9**	--	--	**44.0**	--	--	0.500	U	--	**32.5**	--	--	--	--	--	**11.1**	--	--
DC-01	DC-01-131211	12/11/2013	N	SWL0063	**159**	--	--	**160**	--	--	--	--	--	--	R	MSD	**91.4**	--	--	**47.8**	--	--	5.00	U	--	**32.6**	--	--	--	--	--	**11.5**	--	--
DC-01	DC-01-140318	03/18/2014	N	SXC0095	**159**	--	--	**160**	--	--	--	--	--	**0.101**	--	--	**90.5**	--	--	**48.2**	--	--	5.00	U	--	**31.4**	--	--	--	--	--	**11.2**	--	--
DC-01	DC-01-140602	06/02/2014	N	SXF0017	**164**	--	--	**165**	--	--	--	--	--	0.100	U	--	**88.6**	--	--	**41.4**	--	--	2.00	U	--	**31.9**	--	--	--	--	--	**9.76**	--	--
DC-01	DC-01-140923	09/23/2014	N	SXI0158	**154**	--	--	**155**	--	--	--	--	--	--	R	MSD	**89.4**	--	--	**41.8**	--	--	5.00	U	--	**31.2**	--	--	--	--	--	**9.00**	--	--
DC-01	DC-01-141216	12/16/2014	N	SXL0121	**140**	--	--	**140**	--	--	--	--	--	0.100	U	--	**92.8**	--	--	**85.7**	--	--	5.00	U	--	**34.0**	--	--	--	--	--	**18.9**	--	--
DC-01	DC-01-150316	03/16/2015	N	5904471	**150**	--	--	**150**	--	--	--	--	--	0.100	U	--	**91.0**	--	--	**44.0**	--	--	5.00	U	--	**32.0**	--	--	--	--	--	**11.0**	--	--
DC-01	DC-01-150616	06/16/2015	N	59010751	**150**	--	--	**150**	--	--	--	--	--	0.100	U	--	**91.0**	J+	MSD	**42.0**	--	--	5.00	U	--	**33.0**	J+	MSD	--	--	--	**9.50**	--	--
DC-01	DC-01-150923	09/23/2015	N	59020281	**150**	--	--	**150**	--	--	--	--	--	**0.130**	--	--	**83.0**	--	--	**37.0**	--	--	5.00	U	--	**32.0**	--	--	--	--	--	**8.60**	--	--
DC-01	YVD-D1-150923	09/23/2015	FD	59020281	**160**	--	--	**160**	--	--	--	--	--	0.100	U	--	**85.0**	--	--	**43.0**	--	--	0.500	U	--	**33.0**	--	--	--	--	--	**10.0**	--	--
DC-01	DC-01-151214	12/14/2015	N	59025431	**170**	J	FDP	**170**	J	FDP	--	--	--	--	R	MSD	**97.0**	--	--	**38.0**	--	--	5.00	U	--	**34.0**	--	--	--	--	--	**8.80**	--	--
DC-01	DC-01-160308	03/08/2016	N	59029711	**150**	--	--	**150**	--	--	--	--	--	--	R	FBK, FDP	**83.0**	--	--	**40.0**	--	--	5.00	U	--	**30.0**	--	--	--	--	--	**8.60**	--	--
DC-01	DC-01-160620	6/20/2016	N	59037101	**150**	--	--	**150**	--	--	--	--	--	0.100	U	--	**83.0**	--	--	**40.0**	--	--	5.00	U	--	**31.0**	--	--	--	--	--	**9.20**	--	--
DC-01	DC-01-160928	9/28/2016	N	K1611629	**147**	--	--	**147**	--	--	--	--	--	0.050	U	MBK	**80.6**	--	--	**34.0**	--	--	**0.250**	--	--	**28.5**	--	--	--	--	--	**9.15**	--	--
DC-01	DC-01-161212	12/12/2016	N	K1615045	**144**	--	--	**144**	--	--	--	--	--	0.050	U	--	**81.1**	--	--	**31.9**	--	--	**0.390**	--	--	**27.9**	--	--	--	--	--	**8.89**	J	HTQ
DC-01	YVD-030817-18	3/8/2017	N	K1702324	**148**	--	--	**148**	--	--	--	--	--	1.00	U	--	**80.8**	--	--	**32.6**	--	--	**0.390**	--	--	**27.0**	--	--	--	--	--	**9.00**	--	--
DC-01	YVD-060417-03	6/4/2017	N	K1705702	**147**	--	--	**147**	--	--	--	--	--	0.050	U	--	**83.4**	--	--	**32.9**	--	--	**0.400**	--	--	**26.2**	--	--	--	--	--	**8.20**	--	--
DC-01	YVD-060417-05	6/4/2017	FD	K1705702	**147**	--	--	**147**	--	--	--	--	--	0.050	U	--	**83.0**	--	--	**33.2**	--	--	**0.380**	--	--	**25.7**	--	--	--	--	--	**8.20**	--	--
DC-01	YVD-092517-13	9/25/2017	N	K1710333	**148**	--	--	**148**	--	--	--	--	--	0.050	U	--	**78.9**	--	--	**33.2**	--	--	**0.370**	--	--	**26.1**	--	--	--	--	--	**8.41**	--	--
DC-01	YVD-120617-31	12/6/2017	N	K1713157	**146**	--	--	**146**	--	--	--	--	--	0.050	U	--	**83.7**	--	--	**33.2**	--	--	**0.370**	--	--	**28.1**	--	--	--	--	--	**8.81**	--	--
DC-01	YVD-060418-19	6/4/2018	N	874662	**141**	--	--	**141**	--	--	0.070	U	FBK	--	--	--	**80.5**	--	--	**34.6**	--	--	**0.360**	--	--	**28.8**	--	--	--	--	--	**8.60**	--	--
DC-01	YVD-060219-03	6/2/2019	N	991939	**142**	--	--	**142**	--	--	0.070	U	--	--	--	--	**76.5**	--	--	46.3	U	FBK	0.990	U	FBK	**26.2**	--	--	--	--	--	**8.60**	--	--
DC-01	YVD-060820-07	6/8/2020	N	009144	**143**	--	--	**143**	--	--	0.070	U	--	--	--	--	**76.0**	--	--	**33.1**	--	--	**0.300**	--	--	**26.3**	--	--	--	--	--	**7.60**	--	--
DC-01	YVD-060721-10	6/7/2021	N	124105	**140**	--	--	**140**	--	--	0.070	U	--	--	--	--	**72.5**	--	--	**32.4**	--	--	**0.320**	--	--	**25.2**	--	--	--	--	--	**8.00**	--	--
DC-01	YVD-060622-15	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**7.80**	--	--
DC-01	YVD-061923-02	6/19/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**7.79**	J	HTQ
DC-03	DC-03-130102	01/02/2013	N	EPA01	--	--	--	--	--	--	--	--	--	0.100	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**190**	--	--
DC-03	DC-03-130918	09/18/2013	N	SWI0138	**435**	--	--	**435**	--	--	--	--	--	0.100	U	--	**284**	--	--	**176**	--	--	5.00	U	--	**73.7**	--	--	--	--	--	**166**	--	--
DC-03	DC-03-131212	12/12/2013	N	SWL0078	**474**	--	--	**475**	--	--	--	--	--	0.020	U	--	**280**	--	--	**172**	--	--	5.00	U	--	**75.0**	--	--	--	--	--	**174**	--	--
DC-03	YVD-D3-131212	12/12/2013	FD	SWL0078	**459**	--	--	**460**	--	--	--	--	--	0.020	U	--	**292**	--	--	**142**	--	--	5.00	U	--	**77.3**	--	--	--	--	--	**182**	--	--
DC-03	DC-03-140319	03/19/2014	N	SXC0107	**459**	--	--	**460**	--	--	--	--	--	0.100	U	--	**261**	--	--	**159**	J	FDP	5.00	U	--	**66.8**	--	--	--	--	--	**195**	--	--
DC-03	YVD-D3-140319	03/19/2014	FD	SXC0107	**469**	--	--	**470**	--	--	--	--	--	0.100	U	--	**261**	--	--	**128**	J	FDP	5.00	U	--	**66.7**	--	--	--	--	--	**164**	--	--
DC-03	DC-03-140604	06/04/2014	N	SXF0025	**425**	--	--	**425**	--	--	--	--	--	0.100	U	--	**259**	--	--	**201**	--	--	10.0	U	--	**67.7**	--	--	--	--	--	**234**	--	--
DC-03	DC-03-140924	09/24/2014	N	SXI0173	**409**	--	--	**410**	--	--	--	--	--	0.100	U	--	**291**	--	--	**147**	--	--	5.00	U	--	**77.1**	--	--	--	--	--	**170**	--	--
DC-03	DC-03-141217	12/17/2014	N	SXL0144	**429**	--	--	**430**	--	--	--	--	--	**0.180**	J+	FBK, MBK	**274**	--	--	**157**	--	--	10.0	U	--	**74.9**	--	--	--	--	--	**193**	--	--
DC-03	YVD-D4-141217	12/17/2014	FD	SXL0144	**423**	--	--	**425**	--	--	--	--	--	0.100	U	--	**271**	--	--	**182**	--	--	5.00	U	--	**72.6**	--	--	--	--	--	**156**	--	--
DC-03	DC-03-150318	03/18/2015	N	5904651	**420**	--	--	**420**	--	--	--	--	--	0.100	U	--	**260**	--	--	**160**	--	--	5.00	U	--	**73.0**	--	--	--	--	--	**180**	--	--
DC-03	YVD-D4-150318	03/18/2015	FD	5904651	**410**	--	--	**410**	--	--	--	--	--	**0.120**	--	--	**270**	--	--	**150**	--	--	2.50	U	--	**74.0**	--	--	--	--	--	**180**	--	--
DC-03	DC-03-150617	06/17/2015	N	59011021	**460**	--	--	**460**	--	--	--	--	--	0.100	U	--	**290**	--	--	**170**	--	--	5.00	U	--	**78.0**	J	RPD	--	--	--	**180**	J-	MSD, FBD, FDP
DC-03	YVD-D4-150617	06/17/2015	FD	59011021	**450**	--	--	**450**	--	--	--	--	--	0.100	U	--	**290**	--	--	**180**	--	--	5.00	U	--	**77.0**	J	RPD	--	--	--	**10**	J-	MSD, FBD, FDP
DC-03	DC-03-150925	09/25/2015	N	59020431	**390**	--	--	**390**	--	--	--	--	--	**0.100**	--	--	**270**	--	--	**140**	--	--	10.0	U	--	**73.0**	--	--	--	--	--	**180**	--	--
DC-03	YVD-D4-150925	09/25/2015	FD	59020431	**460**	--	--	**460**	--	--	--	--	--	**0.200**	--	--	**260**	--	--	**140**	--	--	0.50	U	--	**69.0**	--	--	--	--	--	**180**	--	--
DC-03	DC-03-151216	12/16/2015	N	59025501	**400**	--	--	**400**	--	--	--	--	--	**0.180**	J-	MSD	**260**	--	--	**170**	--	--	5.00	U	--	**75.0**	--	--	--	--	--	**200**	--	--
DC-03	YVD-D4-151216	12/16/2015	FD	59025501	**380**	--	--	**380**	--	--	--	--	--	--	R	MSD	**250**	--	--	**160**	--	--	2.50	U	--	**75.0**	--	--	--	--	--	**170**	--	--
DC-03	DC-03-160310	03/10/2016	N	59029941	**460**	--	--	**460**	--	--	--	--	--	0.100	U	--	**270**	--	--	**150**	--	--	5.00	U	--	**72.0**	--	--	--	--	--	**180**	--	--
DC-03	YVD-D4-160310	03/10/2016	FD	59029941	**480**	--	--	**480**	--	--	--	--	--	0.100	U	--	**270**	--	--	**160**	--	--	5.00	U	--	**72.0**	--	--	--	--	--	**190**	--	--
DC-03	DC-03-160623	6/23/2016	N	59037371	**420**	--	--	**420**	--	--	--	--	--	**0.120**	J-	MSD	**270**	--	--	**150**	--	--	5.00	U	--	**73.0**	--	--	--	--	--	**180**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			EPA 350.1			SM 4500 NH3--G			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-03	YVD-D4-160623	6/23/2016	FD	59037371	**410**	--	--	**410**	--	--	--	--	--	**0.110**	J-	MSD	**250**	--	--	**160**	--	--	2.50	U	--	**71.0**	--	--	--	--	--	**170**	--	--
DC-03	DC-03-160927	9/27/2016	N	K1611565	**425**	--	--	**425**	--	--	--	--	--	0.050	U	MBK	**265**	--	--	**136**	--	--	**0.200**	J	--	**72.4**	--	--	--	--	--	**163**	--	--
DC-03	DC-03-D2-160927	9/27/2016	FD	K1611565	**427**	--	--	**427**	--	--	--	--	--	0.050	U	MBK	**262**	--	--	**137**	--	--	**0.190**	J	--	**71.9**	--	--	--	--	--	**163**	--	--
DC-03	DC-03-161212	12/12/2016	N	K1615029	**371**	--	--	**371**	--	--	--	--	--	0.050	U	--	**254**	--	--	**131**	--	--	**0.240**	--	--	**65.7**	--	--	--	--	--	**168**	J	HTQ
DC-03	YVD-030817-13	3/8/2017	N	K1702324	**381**	--	--	**381**	--	--	--	--	--	1.00	U	--	**267**	--	--	**150**	--	--	**0.220**	--	--	**66.0**	--	--	--	--	--	**179**	--	--
DC-03	YVD-060517-02	6/5/2017	N	K1705702	**358**	--	--	**358**	--	--	--	--	--	0.050	U	--	**271**	--	--	**152**	--	--	**0.240**	--	--	**61.6**	--	--	--	--	--	**181**	--	--
DC-03	YVD-060517-04	6/5/2017	FD	K1705702	**360**	--	--	**360**	--	--	--	--	--	0.050	U	--	**269**	--	--	**152**	--	--	**0.280**	--	--	**70.6**	--	--	--	--	--	**182**	--	--
DC-03	YVD-092617-22	9/26/2017	N	K1710333	**329**	--	--	**329**	--	--	--	--	--	0.050	U	--	**279**	--	--	**154**	--	--	**0.240**	--	--	**68.9**	--	--	--	--	--	**192**	--	--
DC-03	YVD-120417-10	12/4/2017	N	K1713026	**333**	--	--	**333**	--	--	--	--	--	0.050	U	--	**274**	--	--	**161**	--	--	**0.240**	--	--	**69.4**	--	--	--	--	--	**207**	--	--
DC-03	YVD-031818-04	3/18/2018	N	870610	**374**	--	--	**374**	--	--	0.070	U	--	--	--	--	**280**	--	--	**156**	--	--	**0.190**	--	--	**67.0**	--	--	--	--	--	**192**	--	--
DC-03	YVD-060418-22	6/4/2018	N	874860	**358**	--	--	**358**	--	--	**1.22**	--	--	--	--	--	**266**	--	--	**152**	--	--	**0.190**	--	--	**67.0**	--	--	--	--	--	**184**	--	--
DC-03	YVD-090918-17	9/9/2018	N	880601	**460**	--	--	**460**	--	--	0.070	U	--	--	--	--	**267**	--	--	**133**	--	--	**0.200**	--	--	**65.5**	--	--	--	--	--	**157**	--	--
DC-03	YVD-121018-03	12/10/2018	N	884857	**415**	--	--	**415**	--	--	0.070	U	--	--	--	--	**263**	--	--	**142**	--	--	0.200	U	FBK	**65.5**	J	MSD	--	--	--	**180**	--	--
DC-03	YVD-031819-19	3/18/2019	N	988273	**435**	--	--	**435**	--	--	0.070	U	--	--	--	--	**276**	--	--	**150**	--	--	**0.190**	--	--	**66.0**	--	--	--	--	--	**186**	--	--
DC-03	YVD-060419-32	6/4/2019	N	992242	**406**	--	--	**406**	--	--	**0.270**	--	--	--	--	--	**282**	--	--	**155**	--	--	**0.270**	--	--	**70.0**	--	--	--	--	--	**178**	--	--
DC-03	YVD-091019-23	9/10/2019	N	998438	**463**	--	--	**463**	--	--	0.070	U	--	--	--	--	**285**	--	--	**132**	--	--	**0.150**	--	--	**74.0**	--	--	--	--	--	**180**	--	--
DC-03	YVD-121019-22	12/10/2019	N	902321	**433**	--	--	**433**	--	--	0.070	U	--	--	--	--	**261**	--	--	**121**	--	--	**0.170**	--	--	**65.5**	--	--	--	--	--	**175**	--	--
DC-03	YVD-033120-22	3/31/2020	N	006260	**418**	--	--	**418**	--	--	0.070	U	--	--	--	--	**284**	--	--	**136**	--	--	**0.170**	--	--	**71.0**	--	--	--	--	--	**166**	--	--
DC-03	YVD-060920-26	6/9/2020	N	009269	**426**	--	--	**426**	--	--	0.070	U	--				**298**	--	--	**163**	--	--	**0.140**	--	--	**75.0**	--	--	--	--	--	**205**	--	--
DC-03	YVD-092120-21	9/21/2020	N	013896	**429**	--	--	**429**	--	--	0.070	U	--	--	--	--	**284**	--	--	**140**	--	--	**0.240**	--	--	**73.5**	--	--	--	--	--	**177**	--	--
DC-03	YVD-120720-05	12/7/2020	N	017035	**430**	--	--	**430**	--	--	0.070	U	--	--	--	--	**260**	--	--	**122**	--	--	**0.150**	--	--	**64.5**	--	--	--	--	--	**144**	--	--
DC-03	YVD-120720-07	12/7/2020	FD	017035	**431**	--	--	**431**	--	--	0.070	U	--	--	--	--	**256**	--	--	**122**	--	--	**0.150**	--	--	**64.5**	--	--	--	--	--	**153**	--	--
DC-03	YVD-030221-23	3/2/2021	N	120034	**393**	--	--	**393**	--	--	0.070	U	--	--	--	--	**286**	--	--	**141**	--	--	**0.170**	--	--	**69.0**	--	--	--	--	--	**186**	--	--
DC-03	YVD-060821-27	6/8/2021	N	124212	**406**	--	--	**406**	--	--	0.070	U	--	--	--	--	**280**	--	--	**150**	--	--	0.100	U	--	**69.5**	--	--	--	--	--	**185**	--	--
DC-03	YVD-031522-10	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**182**	--	--
DC-03	YVD-031522-11	3/15/2022	FD	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**183**	--	--
DC-03	YVD-060522-10	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**157**	--	--
DC-03	YVD-091322-12	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**155**	--	--
DC-03	YVD-122722-21	12/27/2022	N	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**138**	--	--
DC-03	YVD-030623-15	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**140**	--	--	--	--	--
DC-03	YVD-062023-20	6/20/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**130**	J	HTQ
DC-03	YVD-091023-06	9/10/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**139**	J	HTQ
DC-03	YVD-120423-14	12/4/2023	N	K2313657	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**137**	J	HTQ
DC-03D	DC-03D-130918	09/18/2013	N	SWI0138	**509**	--	--	**510**	--	--	--	--	--	0.100	U	--	**198**	--	--	**56.0**	--	--	5.00	U	--	**44.0**	--	--	--	--	--	**46.4**	--	--
DC-03D	DC-03D-131212	12/12/2013	N	SWL0073	**559**	--	--	**560**	--	--	--	--	--	0.020	UJ	MSD	**194**	--	--	**67.9**	--	--	5.00	U	--	**43.3**	--	--	--	--	--	**38.9**	--	--
DC-03D	DC-03D-140319	03/19/2014	N	SXC0107	**564**	--	--	**565**	--	--	--	--	--	**0.127**	--	--	**200**	--	--	**65.9**	--	--	5.00	U	--	**43.9**	--	--	--	--	--	**42.5**	--	--
DC-03D	DC-03D-140603	06/03/2014	N	SXF0017	**542**	--	--	**543**	--	--	--	--	--	0.100	U	--	**179**	--	--	**65.5**	--	--	2.00	U	--	**40.9**	--	--	--	--	--	**42.0**	--	--
DC-03D	DC-03D-140923	09/23/2014	N	SXI0173	**514**	--	--	**515**	--	--	--	--	--	0.100	U	--	**216**	--	--	**59.5**	--	--	2.50	U	--	**46.6**	--	--	--	--	--	**38.0**	--	--
DC-03D	DC-03D-141217	12/17/2014	N	SXL0121	**514**	--	--	**515**	--	--	--	--	--	0.100	U	--	**203**	--	--	**62.8**	--	--	2.50	U	--	**46.8**	--	--	--	--	--	**38.6**	--	--
DC-03D	DC-03D-150317	03/17/2015	N	5904651	**530**	--	--	**530**	--	--	--	--	--	0.100	U	--	**210**	--	--	**63.0**	--	--	2.50	U	--	**48.0**	--	--	--	--	--	**37.0**	--	--
DC-03D	DC-03D-150617	06/17/2015	N	59011021	**530**	--	--	**530**	--	--	--	--	--	0.100	U	--	**210**	--	--	**71.0**	--	--	2.50	U	--	**48.0**	J	RPD	--	--	--	**42.0**	J-	MSD
DC-03D	DC-03D-150925	09/25/2015	N	59020431	**610**	--	--	**610**	--	--	--	--	--	0.100	U	--	**200**	--	--	**58.0**	--	--	10.0	U	--	**47.0**	--	--	--	--	--	**33.0**	--	--
DC-03D	DC-03D-151216	12/16/2015	N	59025501	**590**	--	--	**590**	--	--	--	--	--	--	R	MSD	**210**	--	--	**70.0**	--	--	2.50	U	--	**50.0**	--	--	--	--	--	**36.0**	--	--
DC-03D	DC-03D-160310	03/10/2016	N	59029941	**580**	--	--	**580**	--	--	--	--	--	0.100	U	--	**200**	--	--	**65.0**	--	--	2.50	U	--	**47.0**	--	--	--	--	--	**37.0**	--	--
DC-03D	DC-03D-160623	6/23/2016	N	59037371	**530**	--	--	**530**	--	--	--	--	--	**0.110**	J-	MSD	**200**	--	--	**65.0**	--	--	5.00	U	--	**47.0**	--	--	--	--	--	**36.0**	--	--
DC-03D	DC-03D-160927	9/27/2016	N	K1611565	**546**	--	--	**546**	--	--	--	--	--	0.050	U	MBK	**188**	--	--	**58.7**	--	--	**0.100**	J	--	**47.1**	--	--	--	--	--	**32.8**	--	--
DC-03D	DC-03D-161212	12/12/2016	N	K1615029	**544**	--	--	**544**	--	--	--	--	--	0.050	U	--	**200**	--	--	**57.8**	--	--	**0.120**	J	--	**44.8**	--	--	--	--	--	**33.8**	J	HTQ
DC-03D	YVD-030817-14	3/8/2017	N	K1702324	**537**	--	--	**537**	--	--	--	--	--	1.00	U	--	**196**	--	--	**59.5**	--	--	**0.160**	J	--	**43.4**	--	--	--	--	--	**32.9**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			EPA 350.1			SM 4500 NH3--G			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-03D	YVD-030817-16	3/8/2017	FD	K1702324	**555**	--	--	**555**	--	--	--	--	--	1.00	U	--	**194**	--	--	**59.1**	--	--	**0.170**	J	--	**42.7**	--	--	--	--	--	**32.8**	--	--
DC-03D	YVD-060517-09	6/5/2017	N	K1705702	**533**	--	--	**533**	--	--	--	--	--	0.050	U	--	**203**	--	--	**58.7**	--	--	**0.130**	J	--	**41.3**	--	--	--	--	--	**31.9**	--	--
DC-03D	YVD-092617-24	9/26/2017	N	K1710333	**537**	--	--	**537**	--	--	--	--	--	0.050	U	--	**194**	--	--	**60.1**	--	--	**0.120**	J	--	**44.2**	--	--	--	--	--	**33.2**	--	--
DC-03D	YVD-120417-08	12/4/2017	N	K1713026	**525**	--	--	**525**	--	--	--	--	--	0.050	U	--	**195**	--	--	**57.9**	--	--	**0.170**	J	--	**41.5**	--	--	--	--	--	**33.6**	--	--
DC-03D	YVD-031818-02	3/18/2018	N	870610	**529**	--	--	**529**	--	--	0.070	U	--	--	--	--	**199**	--	--	**66.1**	--	--	0.100	U	--	**42.7**	--	--	--	--	--	**32.6**	--	--
DC-03D	YVD-060418-24	6/4/2018	N	874860	**533**	--	--	**533**	--	--	0.070	U	--	--	--	--	**187**	--	--	**64.7**	--	--	**0.100**	--	--	**42.9**	--	--	--	--	--	**31.0**	--	--
DC-03D	YVD-090918-15	9/9/2018	N	880601	**541**	--	--	**541**	--	--	0.070	U	--	--	--	--	**200**	--	--	**69.5**	--	--	**0.100**	--	--	**42.9**	--	--	--	--	--	**32.9**	--	--
DC-03D	YVD-121018-05	12/10/2018	N	884857	**543**	--	--	**543**	--	--	0.070	U	--	--	--	--	**191**	--	--	**62.1**	--	--	0.100	U	FBK	**42.5**	J	MSD	--	--	--	**34.8**	--	--
DC-03D	YVD-031819-17	3/18/2019	N	988273	**536**	--	--	**536**	--	--	0.070	U	--	--	--	--	**192**	--	--	**61.4**	--	--	**0.130**	--	--	**41.6**	--	--	--	--	--	**35.4**	--	--
DC-03D	YVD-060419-30	6/4/2019	N	992242	**499**	--	--	**499**	--	--	0.070	U	--	--	--	--	**186**	--	--	**59.6**	--	--	0.100	U	--	**40.4**	--	--	--	--	--	**36.6**	--	--
DC-03D	YVD-060419-31	6/4/2019	FD	992242	**494**	--	--	**494**	--	--	0.070	U	--	--	--	--	**182**	--	--	**60.6**	--	--	0.100	U	--	**40.7**	--	--	--	--	--	**37.2**	--	--
DC-03D	YVD-091019-21	9/10/2019	N	998438	**506**	--	--	**506**	--	--	0.070	U	--	--	--	--	**186**	--	--	**58.4**	--	--	0.100	U	--	**41.0**	--	--	--	--	--	**36.4**	--	--
DC-03D	YVD-091019-22	9/10/2019	FD	998438	**514**	--	--	**514**	--	--	0.070	U	--	--	--	--	**186**	--	--	**58.3**	--	--	0.100	U	--	**41.2**	--	--	--	--	--	**36.5**	--	--
DC-03D	YVD-121019-20	12/10/2019	N	902321	**502**	--	--	**502**	--	--	0.070	U	--	--	--	--	**182**	--	--	**65.0**	--	--	0.100	U	--	**39.9**	--	--	--	--	--	**36.2**	--	--
DC-03D	YVD-033120-20	3/31/2020	N	006260	**456**	--	--	**456**	--	--	0.070	U	--	--	--	--	**175**	--	--	**58.5**	--	--	0.100	U	--	**38.4**	--	--	--	--	--	**39.0**	--	--
DC-03D	YVD-061020-34	6/10/2020	N	009361	**458**	--	--	**458**	--	--	0.070	U	--	--	--	--	**168**	--	--	**60.8**	--	--	0.100	U	--	**36.2**	J	MS	--	--	--	**37.0**	--	--
DC-03D	YVD-092120-19	9/21/2020	N	013896	**460**	--	--	**460**	--	--	0.070	U	--	--	--	--	**176**	--	--	**68.9**	--	--	0.100	U	--	**38.3**	--	--	--	--	--	**38.5**	--	--
DC-03D	YVD-120720-09	12/7/2020	N	017035	**452**	--	--	**452**	--	--	0.070	U	--	--	--	--	**174**	--	--	**66.3**	--	--	**0.150**	--	--	**38.6**	--	--	--	--	--	**35.8**	--	--
DC-03D	YVD-030221-21	3/2/2021	N	120034	**481**	--	--	**481**	--	--	0.070	U	--	--	--	--	**181**	--	--	**69.6**	--	--	0.100	U	--	**39.2**	--	--	--	--	--	**39.8**	--	--
DC-03D	YVD-030221-21	3/2/2021	N	120034	**481**	--	--	**481**	--	--	0.070	U	--	--	--	--	**181**	--	--	**69.6**	--	--	0.100	U	--	**39.2**	--	--	--	--	--	**39.8**	--	--
DC-03D	YVD-060821-29	6/8/2021	N	124212	**456**	--	--	**456**	--	--	0.070	U	--	--	--	--	**175**	--	--	**66.8**	--	--	0.100	U	--	**39.0**	--	--	--	--	--	**41.4**	--	--
DC-03D	YVD-060821-31	6/8/2021	FD	124212	**455**	--	--	**455**	--	--	0.070	U	--	--	--	--	**174**	--	--	**66.7**	--	--	0.100	U	--	**38.4**	--	--	--	--	--	**39.9**	--	--
DC-03D	YVD-121421-10	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**35.1**	--	--
DC-03D	YVD-031422-08	3/14/2022	N	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**41.6**	--	--
DC-03D	YVD-060522-11	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**39.1**	--	--
DC-03D	YVD-060522-11	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**39.1**	--	--
DC-03D	YVD-091322-10	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**37.7**	--	--
DC-03D	YVD-122722-20	12/27/2022	N	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**36.8**	--	--
DC-03D	YVD-030623-14	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**40.7**	--	--	--	--	--
DC-03D	YVD-062023-17	6/20/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**36.0**	J	HTQ
DC-03D	YVD-062023-18	6/20/2023	FD	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**36.2**	J	HTQ
DC-03D	YVD-091023-04	9/10/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**36.7**	J	HTQ
DC-03D	YVD-120423-12	12/4/2023	N	K2313657	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**36.9**	J	HTQ
DC-04	DC-04-130103	01/03/2013	N	EPA01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**26.0**	--	--
DC-04	DC-04-130920	09/20/2013	N	SWI0142	**305**	--	--	**305**	--	--	--	--	--	0.100	U	--	**141**	--	--	**39.4**	--	--	5.00	U	--	**25.5**	--	--	--	--	--	--	--	--
DC-04	DC-04-130924	09/24/2013	N	SWI0175	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**31.7**	--	--
DC-04	DC-04-131212	12/12/2013	N	SWL0073	**315**	--	--	**315**	--	--	--	--	--	0.020	UJ	MSD	**148**	--	--	**41.1**	--	--	5.00	U	--	**28.4**	--	--	--	--	--	**36.7**	--	--
DC-04	DC-04-140318	03/18/2014	N	SXC0107	**325**	--	--	**325**	--	--	--	--	--	0.100	U	--	**153**	--	--	**42.0**	--	--	5.00	U	--	**28.0**	--	--	--	--	--	**37.3**	--	--
DC-04	DC-04-140603	06/03/2014	N	SXF0017	**310**	--	--	**310**	--	--	--	--	--	0.100	U	--	**134**	--	--	**36.2**	--	--	2.00	U	--	**28.9**	--	--	--	--	--	**36.4**	--	--
DC-04	DC-04-140923	09/23/2014	N	SXI0173	**317**	--	--	**320**	--	--	--	--	--	0.100	U	--	**174**	--	--	**39.7**	--	--	2.50	U	--	**34.2**	--	--	--	--	--	**37.8**	--	--
DC-04	DC-04-141217	12/17/2014	N	SXL0121	**329**	--	--	**330**	--	--	--	--	--	0.100	U	--	**182**	--	--	**42.7**	--	--	2.50	U	--	**35.7**	--	--	--	--	--	**40.8**	--	--
DC-04	DC-04-150317	03/17/2015	N	5904651	**340**	--	--	**340**	--	--	--	--	--	0.100	U	--	**180**	--	--	**41.0**	--	--	2.50	U	--	**34.0**	--	--	--	--	--	**39.0**	--	--
DC-04	DC-04-150617	06/17/2015	N	59010961	**330**	--	--	**330**	--	--	--	--	--	0.100	U	--	**180**	--	--	**46.0**	--	--	5.00	U	--	**34.0**	--	--	--	--	--	**42.0**	--	--
DC-04	DC-04-150924	09/24/2015	N	59020391	**400**	--	--	**400**	--	--	--	--	--	0.100	UJ	MSD	**160**	--	--	**48.0**	--	--	2.50	U	--	**36.0**	--	--	--	--	--	**48.0**	J+	MSD
DC-04	YVD-D3-150924	09/24/2015	FD	59020391	**380**	--	--	**380**	--	--	--	--	--	0.100	UJ	MSD	**170**	--	--	**53.0**	--	--	2.50	U	--	**37.0**	--	--	--	--	--	**53.0**	J+	MSD
DC-04	DC-04-151215	12/15/2015	N	59025431	**400**	J	FDP	**400**	J	FDP	--	--	--	--	R	MSD	**180**	--	--	**46.0**	--	--	2.50	U	--	**36.0**	--	--	--	--	--	**48.0**	--	--
DC-04	DC-04-160309	03/09/2016	N	59029711	**390**	--	--	**390**	--	--	--	--	--	0.100	UJ	FDP	**190**	--	--	**53.0**	--	--	2.50	U	--	**36.0**	--	--	--	--	--	**53.0**	--	--
DC-04	DC-04-160621	6/21/2016	N	59037271	**360**	--	--	**360**	--	--	--	--	--	0.100	UJ	MSD	**200**	--	--	**50.0**	--	--	2.50	U	--	**40.0**	--	--	--	--	--	**50.0**	--	--
DC-04	DC-04-160926	9/26/2016	N	K1611506	**374**	--	--	**374**	--	--	--	--	--	0.050	U	MBK	**194**	--	--	**43.4**	--	--	**0.120**	J	--	**40.6**	--	--	--	--	--	**44.1**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			EPA 350.1			SM 4500 NH3--G			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-04	DC-04-161216	12/12/2016	N	K1615174	**384**	--	--	**384**	--	--	--	--	--	0.050	U	--	**214**	--	--	**44.7**	--	--	**0.150**	J	--	**39.7**	--	--	--	--	--	**45.2**	--	--
DC-04	YVD-031017-31	3/10/2017	N	K1702448	**375**	--	--	**375**	--	--	--	--	--	0.050	U	--	**219**	--	--	**43.1**	--	--	**0.160**	J	--	**36.3**	--	--	--	--	--	**46.0**	--	--
DC-04	YVD-031017-33	3/10/2017	FD	K1702448	**383**	--	--	**383**	--	--	--	--	--	0.050	U	--	**219**	--	--	**43.2**	--	--	**0.160**	J	--	**36.3**	--	--	--	--	--	**45.7**	--	--
DC-04	YVD-060617-26	6/6/2017	N	K1705833	**390**	--	--	**390**	--	--	--	--	--	0.050	U	--	**202**	--	--	**38.6**	--	--	**0.130**	J	--	**37.0**	--	--	--	--	--	**38.4**	--	--
DC-04	YVD-092517-06	9/25/2017	N	K1710274	**391**	--	--	**391**	--	--	--	--	--	0.050	U	--	**192**	--	--	**35.2**	--	--	**0.140**	J	--	**37.0**	--	--	--	--	--	**33.7**	--	--
DC-04	YVD-120517-24	12/5/2017	N	K1713091	**388**	--	--	**388**	--	--	--	--	--	0.050	U	--	**188**	--	--	**34.3**	--	--	**0.120**	J	--	**32.7**	--	--	--	--	--	**33.8**	J	HTQ
DC-04	YVD-031818-07	3/18/2018	N	870610	**377**	--	--	**377**	--	--	0.070	U	--	--	--	--	**182**	--	--	**34.5**	--	--	0.100	U	--	**32.1**	--	--	--	--	--	**32.9**	--	--
DC-04	YVD-060418-18	6/4/2018	N	874662	**380**	--	--	**380**	--	--	0.070	U	FBK	--	--	--	**182**	--	--	**35.4**	--	--	**0.100**	--	--	**33.6**	--	--	--	--	--	**33.0**	--	--
DC-04	YVD-090918-18	9/9/2018	N	880601	**371**	--	--	**371**	--	--	0.070	U	--	--	--	--	**176**	--	--	**32.4**	--	--	**0.120**	--	--	**30.4**	--	--	--	--	--	**30.4**	--	--
DC-04	YVD-121118-18	12/11/2018	N	884939	**376**	--	--	**376**	--	--	0.070	U	--	--	--	--	**166**	--	--	**30.4**	--	--	**0.110**	--	--	**29.4**	--	--	--	--	--	**29.4**	--	--
DC-04	YVD-032019-21	3/20/2019	N	988477	**393**	--	--	**393**	--	--	0.070	U	--	--	--	--	**172**	--	--	**26.2**	--	--	**0.100**	--	--	**30.5**	--	--	--	--	--	**29.6**	--	--
DC-04	YVD-060219-14	6/2/2019	N	991939	**390**	--	--	**390**	--	--	**0.090**	--	--	--	--	--	**173**	--	--	22.9	U	FBK	0.100	U	--	**30.6**	--	--	--	--	--	**29.1**	--	--
DC-04	YVD-090919-09	9/9/2019	N	998357	**387**	--	--	**387**	--	--	0.070	U	--	--	--	--	**169**	--	--	**33.1**	--	--	0.100	U	--	**30.4**	--	--	--	--	--	**31.4**	--	--
DC-04	YVD-120919-07	12/9/2019	N	902276	**382**	--	--	**382**	--	--	0.070	U	--	--	--	--	**167**	--	--	**33.4**	--	--	0.100	U	--	**30.4**	--	--	--	--	--	**31.3**	--	--
DC-04	YVD-033120-18	3/31/2020	N	006260	**390**	--	--	**390**	--	--	0.070	U	--	--	--	--	**171**	--	--	**34.1**	--	--	**0.100**	--	--	**30.5**	--	--	--	--	--	**29.8**	--	--
DC-04	YVD-060820-08	6/8/2020	N	009144	**395**	--	--	**395**	--	--	0.070	U	--	--	--	--	**173**	--	--	**34.5**	--	--	**0.100**	--	--	**31.0**	--	--	--	--	--	**30.9**	--	--
DC-04	YVD-092020-07	9/20/2020	N	013864	**403**	--	--	**403**	--	--	0.070	U	--	--	--	--	**184**	--	--	**39.4**	--	--	0.100	U	--	**33.4**	--	--	--	--	--	**34.1**	--	--
DC-04	YVD-120820-23	12/8/2020	N	017137	**422**	--	--	**422**	--	--	0.070	U	--	--	--	--	**193**	--	--	**41.3**	--	--	0.100	U	--	**34.7**	--	--	--	--	--	**34.4**	--	--
DC-04	YVD-030221-20	3/2/2021	N	120034	**443**	--	--	**443**	--	--	0.070	U	--	--	--	--	**208**	--	--	**46.2**	--	--	**0.150**	--	--	**36.2**	--	--	--	--	--	**35.0**	--	--
DC-04	YVD-030221-22	3/2/2021	FD	120034	**440**	--	--	**440**	--	--	0.070	U	--	--	--	--	**200**	--	--	**45.7**	--	--	**0.150**	--	--	**35.7**	--	--	--	--	--	**34.3**	--	--
DC-04	YVD-060621-06	6/6/2021	N	124053	**438**	--	--	**438**	--	--	0.070	U	--	--	--	--	**195**	--	--	**39.6**	--	--	0.100	U	--	**34.8**	--	--	--	--	--	**30.9**	--	--
DC-04	YVD-121521-21	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**32.7**	J	HTQ, MS
DC-04	YVD-031522-15	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**35.3**	--	--
DC-04	YVD-060522-05	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**34.5**	--	--
DC-04	YVD-091322-06	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**33.0**	--	--
DC-04	YVD-120722-09	12/7/2022	N	K2214479	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**30.2**	--	--
DC-04	YVD-120722-10	12/7/2022	FD	K2214479	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**30.4**	--	--
DC-04	YVD-030623-17	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**29.9**	--	--	--	--	--
DC-04	YVD-030623-18	3/6/2023	FD	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**29.7**	--	--	--	--	--
DC-04	YVD-062023-11	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**27.6**	J	HTQ
DC-04	YVD-091123-22	9/11/2023	N	K2310209	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**24.9**	J	HTQ
DC-04	YVD-120423-08	12/4/2023	N	K2313548	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**23.2**	--	--
DC-05	DC-05-130104	01/04/2013	N	EPA01	--		--	--		--	--	--	--	--		--	--		--	--		--	--		--	--		--	--		--	--		**32.0**		--
DC-05	DC-05-130920	09/20/2013	N	SWI0142	**414**		--	**415**		--	--	--	--	**0.255**		--	**129**		--	**36.7**		--	5.00	U	--	**48.5**		--	--	--	--	--		--	--
DC-05	DC-05-130924	09/24/2013	N	SWI0175	--		--	--		--	--	--	--	--		--	--		--	--		--	--		--	--		--	--	--	--	**33.6**		--
DC-05	DC-05-131212	12/12/2013	N	SWL0073	**424**	--	--	**425**	--	--	--	--	--	0.020	UJ	MSD	**130**	--	--	**35.9**	--	--	5.00	U	--	**50.2**	--	--	--	--	--	**42.6**	--	--
DC-05	DC-05-140318	03/18/2014	N	SXC0107	**404**	--	--	**405**	--	--	--	--	--	**0.131**	--	--	**133**	--	--	**33.0**	--	--	5.00	U	--	**49.7**	--	--	--	--	--	**33.1**	--	--
DC-05	DC-05-140603	06/03/2014	N	SXF0017	**412**	--	--	**413**	--	--	--	--	--	0.100	U	--	**118**	--	--	**31.6**	--	--	2.00	U	--	**46.7**	--	--	--	--	--	**32.6**	--	--
DC-05	DC-05-140923	09/23/2014	N	SXI0173	**408**	--	--	**410**	--	--	--	--	--	0.100	U	--	**140**	--	--	**35.0**	--	--	2.50	U	--	**53.5**	--	--	--	--	--	**35.8**	--	--
DC-05	DC-05-141217	12/17/2014	N	SXL0121	**414**	--	--	**415**	--	--	--	--	--	0.100	U	--	**147**	--	--	**34.4**	--	--	2.50	U	--	**58.9**	--	--	--	--	--	**33.4**	--	--
DC-05	DC-05-150317	03/17/2015	N	5904541	**430**	--	--	**430**	--	--	--	--	--	0.100	U	--	**150**	--	--	**36.0**	--	--	**2.00**	--	--	**58.0**	--	--	--	--	--	**38.0**	J-	MSD
DC-05	DC-05-150616	06/16/2015	N	59010961	**410**	--	--	**410**	--	--	--	--	--	0.100	U	--	**140**	--	--	**35.0**	--	--	2.00	U	--	**57.0**	--	--	--	--	--	**37.0**	--	--
DC-05	YVD-D2-150616	06/16/2015	FD	59010961	**410**	--	--	**410**	--	--	--	--	--	0.100	U	--	**140**	--	--	**35.0**	--	--	5.00	U	--	**56.0**	--	--	--	--	--	**41.0**	--	--
DC-05	DC-05-150923	09/23/2015	N	59020391	**440**	--	--	**440**	--	--	--	--	--	0.100	UJ	MSD	**130**	--	--	**33.0**	--	--	2.00	U	--	**57.0**	--	--	--	--	--	**38.0**	J+	MSD
DC-05	DC-05-151215	12/15/2015	N	59025431	**440**	J	FDP	**440**	J	FDP	--	--	--	--	R	MSD	**140**	--	--	**29.0**	--	--	2.00	U	--	**55.0**	--	--	--	--	--	**38.0**	--	--
DC-05	DC-05-160309	03/09/2016	N	59029711	**410**	--	--	**410**	--	--	--	--	--	0.100	UJ	FDP	**140**	--	--	**35.0**	--	--	2.00	U	--	**54.0**	--	--	--	--	--	**43.0**	--	--
DC-05	DC-05-160621	6/21/2016	N	59037151	**390**	--	--	**390**	--	--	--	--	--	0.100	UJ	--	**130**	--	--	**34.0**	--	--	2.00	U	--	**54.0**	--	--	--	--	--	**36.0**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			EPA 350.1			SM 4500 NH3--G			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-05	DC-05-160926	9/26/2016	N	K1611506	**346**	--	--	**346**	--	--	--	--	--	0.050	U	--	**119**	--	--	**26.5**	--	--	**0.150**	J	--	**49.7**	--	--	--	--	--	**32.1**	--	--
DC-05	DC-05-D1-160926	9/26/2016	FD	K1611506	**364**	--	--	**364**	--	--	--	--	--	0.050	U	MBK	**124**	--	--	**26.6**	--	--	**0.160**	J	--	**52.5**	--	--	--	--	--	**32.2**	--	--
DC-05	DC-05-161216	12/16/2016	N	K1615174	**348**	--	--	**348**	--	--	--	--	--	0.050	U	--	**129**	--	--	**28.6**	--	--	**0.190**	J	--	**45.4**	--	--	--	--	--	**33.7**	--	--
DC-05	YVD-D5-161216	12/16/2016	FD	K1615174	**340**	--	--	**340**	--	--	--	--	--	0.050	U	--	**128**	--	--	**28.9**	--	--	**0.190**	J	--	**48.0**	--	--	--	--	--	**33.3**	--	--
DC-05	YVD-030717-09	3/7/2017	N	K1702324	**367**	--	--	**367**	--	--	--	--	--	1.00	U	--	**117**	--	--	**28.5**	--	--	**0.200**	J	--	**43.5**	--	--	--	--	--	**32.9**	J	HTQ
DC-05	YVD-060717-30	6/7/2017	N	K1705833	**364**	--	--	**364**	--	--	--	--	--	0.050	U	--	**122**	--	--	**26.8**	--	--	**0.160**	J	--	**47.1**	--	--	--	--	--	**30.8**	--	--
DC-05	YVD-060717-32	6/7/2017	FD	K1705833	**364**	--	--	**364**	--	--	--	--	--	0.050	U	--	**122**	--	--	**26.3**	--	--	**0.160**	J	--	**45.8**	--	--	--	--	--	**30.7**	--	--
DC-05	YVD-092517-04	9/25/2017	N	K1710274	**368**	--	--	**368**	--	--	--	--	--	0.050	U	--	**126**	--	--	**28.1**	--	--	**0.190**	J	--	**49.7**	--	--	--	--	--	**30.7**	--	--
DC-05	YVD-120517-16	12/5/2017	N	K1713091	**364**	--	--	**364**	--	--	--	--	--	0.050	U	--	**119**	--	--	**31.9**	--	--	**0.180**	J	--	**42.5**	--	--	--	--	--	**34.5**	J	HTQ
DC-05	YVD-120517-18	12/5/2017	FD	K1713091	**366**	--	--	**366**	--	--	--	--	--	0.050	U	--	**120**	--	--	**31.3**	--	--	**0.190**	J	--	**43.1**	--	--	--	--	--	**33.9**	J	HTQ
DC-05	YVD-031818-03	3/18/2018	N	870610	**364**	--	--	**364**	--	--	**0.100**	--	--	--	--	--	**116**	--	--	**33.0**	--	--	0.140	U	--	**42.4**	--	--	--	--	--	**33.6**	--	--
DC-05	YVD-031818-05	3/18/2018	FD	870610	**356**	--	--	**356**	--	--	0.070	U	--	--	--	--	**116**	--	--	**33.1**	--	--	**0.140**	--	--	**42.9**	--	--	--	--	--	**33.8**	--	--
DC-05	YVD-060318-02	6/3/2018	FD	874568	**368**	--	--	**368**	--	--	0.070	U	--	--	--	--	**118**	--	--	**32.2**	--	--	**0.150**	--	--	**43.5**	--	--	--	--	--	**34.4**	--	--
DC-05	YVD-090918-03	9/9/2018	N	880601	**378**	--	--	**378**	--	--	0.070	U	--	--	--	--	**122**	--	--	**31.4**	--	--	**0.180**	--	--	**42.6**	--	--	--	--	--	**31.5**	--	--
DC-05	YVD-121118-16	12/11/2018	N	884939	**390**	--	--	**390**	--	--	0.070	U	--	--	--	--	**120**	--	--	**33.7**	--	--	**0.160**	--	--	**43.4**	--	--	--	--	--	**33.2**	--	--
DC-05	YVD-031719-02	3/17/2019	N	988239	**396**	--	--	**396**	--	--	0.070	U	--	--	--	--	**126**	--	--	**29.9**	--	--	0.120	U	FBK	**44.3**	--	--	--	--	--	**30.4**	--	--
DC-05	YVD-060219-08	6/2/2019	N	991939	**400**	--	--	**400**	--	--	0.070	U	--	--	--	--	**122**	--	--	26.2	U	FBK	0.120	U	FBK	**44.2**	--	--	--	--	--	**28.8**	--	--
DC-05	YVD-090919-14	9/9/2019	N	998357	**389**	--	--	**389**	--	--	0.070	U	--	--	--	--	**120**	--	--	**25.4**	--	--	**0.140**	--	--	**42.3**	--	--	--	--	--	**26.7**	--	--
DC-05	YVD-120919-03	12/9/2019	N	902276	**400**	--	--	**400**	--	--	0.070	U	--	--	--	--	**120**	--	--	**28.1**	--	--	**0.140**	--	--	**43.0**	--	--	--	--	--	**29.3**	--	--
DC-05	YVD-033020-12	3/30/2020	N	006241	**402**	--	--	**402**	--	--	0.070	U	--	--	--	--	**120**	--	--	**26.0**	--	--	**0.140**	--	--	**43.5**	--	--	--	--	--	**25.6**	--	--
DC-05	YVD-060820-06	6/8/2020	N	009144	**404**	--	--	**404**	--	--	0.070	U	--	--	--	--	**116**	--	--	**24.4**	--	--	**0.160**	--	--	**41.8**	--	--	--	--	--	**24.0**	--	--
DC-05	YVD-092020-03	9/20/2020	N	013864	**387**	--	--	**387**	--	--	0.070	U	--	--	--	--	**126**	--	--	**26.8**	--	--	**0.120**	--	--	**45.1**	--	--	--	--	--	**27.8**	--	--
DC-05	YVD-120720-06	12/7/2020	N	017035	**372**	--	--	**372**	--	--	0.070	U	--	--	--	--	**130**	--	--	**24.0**	--	--	**0.120**	--	--	**47.6**	--	--	--	--	--	**29.6**	--	--
DC-05	YVD-030221-16	3/2/2021	N	120034	**388**	--	--	**388**	--	--	0.070	U	--	--	--	--	**139**	--	--	**30.5**	--	--	**0.120**	--	--	**49.3**	--	--	--	--	--	**32.3**	--	--
DC-05	YVD-060721-14	6/7/2021	N	124105	**360**	--	--	**360**	--	--	0.070	U	--	--	--	--	**129**	--	--	**34.9**	--	--	**0.170**	--	--	**46.5**	--	--	--	--	--	**38.5**	--	--
DC-05	YVD-121521-15	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**43.5**	J	HTQ, MS
DC-05	YVD-031422-04	3/14/2022	N	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**35.9**	--	--
DC-05	YVD-060522-02	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**41.7**	--	--
DC-05	YVD-060522-03	6/5/2022	FD	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**40.6**	--	--
DC-05	YVD-091322-02	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**18.6**	--	--
DC-05	YVD-091322-04	9/13/2022	FD	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**19.0**	--	--
DC-05	YVD-120622-02	12/6/2022	N	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**10.0**	--	--
DC-05	YVD-120622-03	12/6/2022	FD	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**10.0**	--	--
DC-05	YVD-030623-20	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**12.5**	--	--	--	--	--
DC-05	YVD-062023-08	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**33.9**	J	HTQ
DC-05	YVD-091123-16	9/11/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**41.5**	--	--
DC-05	YVD-120423-04	12/4/2023	N	K2313548	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**50.9**	--	--
DC-05	YVD-120423-06	12/4/2023	FD	K2313548	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**50.9**	--	--
DC-05D	DC-05D-130920	09/20/2013	N	SWI0142	**214**	--	--	**215**	--	--	--	--	--	0.100	U	--	**86.7**	--	--	**43.6**	--	--	5.00	U	--	**30.3**	--	--	--	--	--	--	--	--
DC-05D	DC-05D-130924	09/24/2013	N	SWI0178	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**14.6**	--	--
DC-05D	DC-05D-131211	12/11/2013	N	SWL0073	**209**	--	--	**210**	--	--	--	--	--	0.020	UJ	MSD	**81.8**	--	--	**32.3**	--	--	5.00	U	--	**28.8**	--	--	--	--	--	**16.0**	--	--
DC-05D	DC-05D-140318	03/18/2014	N	SXC0095	**209**	--	--	**210**	--	--	--	--	--	**0.182**	--	--	**86.2**	--	--	**33.4**	--	--	5.00	U	--	**29.4**	--	--	--	--	--	**12.8**	--	--
DC-05D	DC-05D-140602	06/02/2014	N	SXF0017	**214**	--	--	**215**	--	--	--	--	--	**0.163**	--	--	**67.4**	--	--	**30.6**	--	--	2.00	U	--	**24.6**	--	--	--	--	--	**3.36**	--	--
DC-05D	DC-05D-140922	09/22/2014	N	SXI0148	**203**	--	--	**205**	--	--	--	--	--	0.100	U	--	**83.3**	--	--	**30.9**	--	--	2.00	U	--	**30.2**	--	--	--	--	--	**11.7**	--	--
DC-05D	DC-05D-141216	12/16/2014	N	SXL0121	**199**	--	--	**200**	--	--	--	--	--	0.100	U	--	**78.9**	--	--	**35.9**	--	--	5.00	U	--	**29.5**	--	--	--	--	--	**7.90**	--	--
DC-05D	DC-05D-150317	03/17/2015	N	5904541	**210**	--	--	**210**	--	--	--	--	--	0.100	U	--	**78.0**	--	--	**31.0**	--	--	2.00	U	--	**29.0**	--	--	--	--	--	**7.70**	J-	MSD
DC-05D	DC-05D-150616	06/16/2015	N	59010961	**210**	--	--	**210**	--	--	--	--	--	0.100	U	--	**79.0**	--	--	**34.0**	--	--	2.00	U	--	**30.0**	--	--	--	--	--	**8.60**	--	--
DC-05D	DC-05D-150923	09/23/2015	N	59020391	**200**	--	--	**200**	--	--	--	--	--	0.100	UJ	MSD	**74.0**	--	--	**31.0**	--	--	2.00	U	--	**31.0**	--	--	--	--	--	**8.90**	J+	MSD

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			EPA 350.1			SM 4500 NH3--G			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-05D	YVD-D2-150923	09/23/2015	FD	59020391	**220**	--	--	**220**	--	--	--	--	--	**0.160**	J	MSD	**73.0**	--	--	**33.0**	--	--	0.500	U	--	**30.0**	--	--	--	--	--	**10.0**	J+	MSD
DC-05D	DC-05D-151215	12/15/2015	N	59025431	**230**	J	FDP	**230**	J	FDP	--	--	--	--	R	MSD	**78.0**	--	--	**30.0**	--	--	2.00	U	--	**29.0**	--	--	--	--	--	**9.90**	--	--
DC-05D	DC-05D-160309	03/09/2016	N	59029711	**220**	--	--	**220**	--	--	--	--	--	0.100	UJ	FDP	**81.0**	--	--	**33.0**	--	--	2.00	U	--	**30.0**	--	--	--	--	--	**13.0**	--	--
DC-05D	DC-05D-160621	6/21/2016	N	59037271	**210**	--	--	**210**	--	--	--	--	--	**0.130**	J-	MSD	**78.0**	--	--	**32.0**	--	--	2.00	U	--	**30.0**	--	--	--	--	--	**12.0**	--	--
DC-05D	DC-05D-160926	9/26/2016	N	K1611506	**209**	--	--	**209**	--	--	--	--	--	0.050	U	--	**81.4**	--	--	**25.6**	--	--	**0.260**	--	--	**28.4**	--	--	--	--	--	**11.2**	--	--
DC-05D	DC-05D-161214	12/14/2016	N	K1615126	**202**	--	--	**202**	--	--	--	--	--	0.050	U	--	**78.1**	--	--	**25.7**	--	--	**0.280**	--	--	**27.5**	--	--	--	--	--	**11.2**	--	--
DC-05D	YVD-030717-12	3/7/2017	N	K1702324	**206**	--	--	**206**	--	--	--	--	--	1.00	U	--	**76.4**	--	--	**26.3**	--	--	**0.320**	--	--	**26.5**	--	--	--	--	--	**11.6**	J	HTQ
DC-05D	YVD-060717-34	6/7/2017	N	K1705833	**201**	--	--	**201**	--	--	--	--	--	0.050	U	--	**79.1**	--	--	**23.9**	--	--	**0.290**	--	--	**27.3**	--	--	--	--	--	**10.8**	--	--
DC-05D	YVD-092517-02	9/25/2017	N	K1710274	**207**	--	--	**207**	--	--	--	--	--	0.050	U	--	**79.2**	--	--	**25.2**	--	--	**0.280**	--	--	**28.9**	--	--	--	--	--	**11.1**	--	--
DC-05D	YVD-092517-03	9/25/2017	FD	K1710274	**207**	--	--	**207**	--	--	--	--	--	0.050	U	--	**80.6**	--	--	**24.9**	--	--	**0.270**	--	--	**29.1**	--	--	--	--	--	**11.0**	--	--
DC-05D	YVD-120517-20	12/5/2017	N	K1713091	**202**	--	--	**202**	--	--	--	--	--	0.050	U	--	**81.2**	--	--	**26.6**	--	--	**0.280**	--	--	**27.1**	--	--	--	--	--	**11.9**	J	HTQ
DC-05D	YVD-031818-08	3/18/2018	N	870610	**198**	--	--	**198**	--	--	0.070	U	--	--	--	--	**82.0**	--	--	**27.4**	--	--	**0.250**	--	--	**27.5**	--	--	--	--	--	**12.6**	--	--
DC-05D	YVD-060318-03	6/3/2018	N	874568	**203**	--	--	**203**	--	--	0.080	U	FBK	--	--	--	**78.5**	--	--	**27.4**	--	--	**0.350**	--	--	**28.0**	--	--	--	--	--	**12.5**	--	--
DC-05D	YVD-060318-05	6/3/2018	FD	874568	**202**	--	--	**202**	--	--	0.070	U	--	--	--	--	**78.5**	--	--	**27.4**	--	--	**0.260**	--	--	**28.0**	--	--	--	--	--	**13.4**	--	--
DC-05D	YVD-090918-02	9/9/2018	N	880601	**204**	--	--	**204**	--	--	0.070	U	--	--	--	--	**79.5**	--	--	**26.8**	--	--	**0.250**	--	--	**26.8**	--	--	--	--	--	**12.2**	--	--
DC-05D	YVD-121118-14	12/11/2018	N	884939	**204**	--	--	**204**	--	--	0.070	U	--	--	--	--	**78.5**	--	--	**25.7**	--	--	**0.240**	--	--	**26.5**	--	--	--	--	--	**12.4**	--	--
DC-05D	YVD-031719-04	3/17/2019	N	988239	**204**	--	--	**204**	--	--	0.070	U	--	--	--	--	**79.0**	--	--	**26.6**	--	--	0.220	U	FBK	**26.9**	--	--	--	--	--	**12.8**	--	--
DC-05D	YVD-031719-06	3/17/2019	FD	988239	**206**	--	--	**206**	--	--	0.070	U	--	--	--	--	**81.5**	--	--	**26.4**	--	--	0.220	U	FBK	**27.1**	--	--	--	--	--	**12.6**	--	--
DC-05D	YVD-060219-10	6/2/2019	N	991939	**206**	--	--	**206**	--	--	0.070	U	--	--	--	--	**78.0**	--	--	26.0	U	FBK	0.250	U	FBK	**26.7**	--	--	--	--	--	**13.8**	--	--
DC-05D	YVD-090919-12	9/9/2019	N	998357	**205**	--	--	**205**	--	--	0.070	U	--	--	--	--	**78.5**	--	--	**26.5**	--	--	**0.300**	--	--	**26.2**	--	--	--	--	--	**12.5**	--	--
DC-05D	YVD-120919-05	12/9/2019	N	902276	**201**	--	--	**201**	--	--	0.070	U	--	--	--	--	**76.5**	--	--	**26.3**	--	--	**0.280**	--	--	**26.2**	--	--	--	--	--	**12.9**	--	--
DC-05D	YVD-033020-14	3/30/2020	N	006241	**202**	--	--	**202**	--	--	0.070	U	--	--	--	--	**75.5**	--	--	**27.3**	--	--	**0.250**	--	--	**26.3**	--	--	--	--	--	**12.8**	--	--
DC-05D	YVD-060820-02	6/8/2020	N	009144	**202**	--	--	**202**	--	--	0.070	U	--	--	--	--	**76.5**	--	--	**26.9**	--	--	**0.200**	--	--	**26.6**	--	--	--	--	--	**14.4**	--	--
DC-05D	YVD-060820-04	6/8/2020	FD	009144	**202**	--	--	**202**	--	--	0.070	U	--	--	--	--	**76.0**	--	--	**26.9**	--	--	**0.200**	--	--	**26.6**	--	--	--	--	--	**12.0**	--	--
DC-05D	YVD-092020-04	9/20/2020	N	013864/20I0421	**202**	--	--	**202**	--	--	0.070	U	--	--	--	--	**78.0**	--	--	**27.2**	--	--	**0.210**	--	--	**27.0**	--	--	--	--	--	**12.0**	--	--
DC-05D	YVD-092020-05	9/20/2020	FD	013864/20I0421	**202**	--	--	**202**	--	--	0.070	U	--	--	--	--	**78.5**	--	--	**27.2**	--	--	**0.220**	--	--	**26.8**	--	--	--	--	--	**12.0**	--	--
DC-05D	YVD-120720-02	12/7/2020	N	017035	**200**	--	--	**200**	--	--	0.070	U	--	--	--	--	**77.5**	--	--	**23.5**	--	--	**0.200**	--	--	**27.1**	--	--	--	--	--	**12.9**	--	--
DC-05D	YVD-120720-04	12/7/2020	FD	017035	**198**	--	--	**198**	--	--	0.070	U	--	--	--	--	**76.5**	--	--	**21.0**	--	--	**0.180**	--	--	**26.9**	--	--	--	--	--	**12.9**	--	--
DC-05D	YVD-030221-18	3/2/2021	N	120034	**206**	--	--	**206**	--	--	0.070	U	--	--	--	--	**80.5**	--	--	**27.9**	--	--	**0.230**	--	--	**27.1**	--	--	--	--	--	**12.8**	--	--
DC-05D	YVD-060721-13	6/7/2021	N	124105	**212**	--	--	**212**	--	--	0.070	U	--	--	--	--	**78.0**	--	--	**27.2**	--	--	**0.220**	--	--	**26.9**	--	--	--	--	--	**13.0**	--	--
DC-05D	YVD-121421-04	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**12.7**	J	HTQ, MS
DC-05D	YVD-031422-02	3/14/2022	N	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**14.2**	--	--
DC-05D	YVD-031422-03	3/14/2022	FD	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**14.2**	--	--
DC-05D	YVD-060522-04	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**9.83**	--	--
DC-05D	YVD-091322-03	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**9.30**	--	--
DC-05D	YVD-120622-04	12/6/2022	N	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**9.80**	--	--
DC-05D	YVD-030623-22	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**10.1**	--	--	--	--
DC-05D	YVD-062023-10	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**11.2**	J	HTQ
DC-05D	YVD-091123-18	9/11/2023	N	K2310209	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**11.4**	J	HTQ
DC-05D	YVD-120423-02	12/4/2023	N	K2313548	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**13.8**	--	--
DC-07	DC-07-130103	01/03/2013	N	EPA01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**2.80**	--	--
DC-07	DC-07-130918	09/18/2013	N	SWI0123	**315**	--	--	**315**	--	--	--	--	--	0.100	U	--	**122**	--	--	**30.5**	--	--	5.00	U	--	**18.4**	--	--	--	--	--	**4.30**	--	--
DC-07	YVD-D1-130918	09/18/2013	FD	SWI0123	**295**	--	--	**295**	--	--	--	--	--	0.100	U	--	**122**	--	--	**32.8**	--	--	5.00	U	--	**18.5**	--	--	--	--	--	**4.30**	--	--
DC-07	DC-07-131210	12/10/2013	N	SWL0055	**260**	--	--	**260**	--	--	--	--	--	0.020	UJ	MSD	**27.5**	--	--	**31.0**	--	--	5.00	U	--	**11.5**	--	--	--	--	--	**4.70**	--	--
DC-07	DC-07-140316	03/16/2014	N	SXC0081	**260**	--	--	**260**	--	--	--	--	--	**0.116**	--	--	**88.4**	--	--	**26.5**	--	--	2.00	U	--	**15.4**	--	--	--	--	--	**4.72**	--	--
DC-07	DC-07-140602	06/02/2014	N	SXF0008	**245**	--	--	**245**	--	--	--	--	--	0.100	U	--	**93.7**	--	--	**28.2**	--	--	2.00	U	--	**16.5**	--	--	--	--	--	0.800	U	--
DC-07	DC-07-140922	09/22/2014	N	SXI0148	**215**	--	--	**215**	--	--	--	--	--	0.100	U	--	**87.1**	--	--	**29.8**	--	--	2.00	U	--	**16.1**	--	--	--	--	--	**4.88**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			EPA 350.1			SM 4500 NH3--G			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-07	DC-07-141216	12/16/2014	N	SXL0108	**210**	--	--	**210**	--	--	--	--	--	0.100	U	--	**83.6**	--	--	**24.2**	--	--	2.00	U	--	**15.1**	--	--	--	--	--	**2.80**	--	--
DC-07	YVD-D2-141216	12/16/2014	FD	SXL0108	**210**	--	--	**210**	--	--	--	--	--	0.100	U	--	**84.2**	--	--	**25.6**	--	--	0.500	U	--	**15.1**	--	--	--	--	--	**2.92**	--	--
DC-07	DC-07-150317	03/17/2015	N	5904541	**240**	--	--	**240**	--	--	--	--	--	0.100	U	--	**94.0**	--	--	**29.0**	--	--	2.00	U	--	**17.0**	--	--	--	--	--	**4.60**	J-	MSD
DC-07	DC-07-150617	06/17/2015	N	59011021	**230**	--	--	**230**	--	--	--	--	--	0.100	U	--	**97.0**	--	--	**32.0**	--	--	2.00	U	--	**17.0**	J	RPD	--	--	--	**4.00**	J-	MSD
DC-07	DC-07-150924	09/24/2015	N	59020391	**240**	--	--	**240**	--	--	--	--	--	0.100	UJ	MSD	**76.0**	--	--	**30.0**	--	--	2.00	U	--	**15.0**	--	--	--	--	--	**2.70**	J+	MSD
DC-07	DC-07-151215	12/15/2015	N	59025501	**240**	--	--	**240**	--	--	--	--	--	--	R	MSD	**87.0**	--	--	**29.0**	--	--	2.00	U	--	**16.0**	--	--	--	--	--	**2.50**	--	--
DC-07	DC-07-160309	03/09/2016	N	59029941	**280**	--	--	**280**	--	--	--	--	--	0.100	U	--	**91.0**	--	--	**31.0**	--	--	2.00	U	--	**17.0**	--	--	--	--	--	**2.20**	--	--
DC-07	DC-07-160621	6/21/2016	N	59037271	**250**	--	--	**250**	--	--	--	--	--	**0.100**	J-	MSD	**96.0**	--	--	**33.0**	--	--	2.00	U	--	**18.0**	--	--	--	--	--	**4.80**	--	--
DC-07	DC-07-160926	9/26/2016	N	K1611565	**204**	--	--	**204**	--	--	--	--	--	0.050	U	--	**82.3**	--	--	**24.4**	--	--	0.200	U	--	**15.0**	--	--	--	--	--	**2.74**	--	--
DC-07	DC-07-161214	12/14/2016	N	K1615083	**218**	--	--	**218**	--	--	--	--	--	0.050	U	--	**77.0**	--	--	**19.2**	--	--	0.200	U	--	**13.1**	--	--	--	--	--	**1.44**	--	--
DC-07	YVD-030917-25	3/9/2017	N	K1702448	**255**	--	--	**255**	--	--	--	--	--	0.050	U	--	**87.9**	--	--	**21.4**	--	--	0.200	U	--	**14.4**	--	--	--	--	--	**2.58**	--	--
DC-07	YVD-060617-18	6/6/2017	N	K1705754	**232**	--	--	**232**	--	--	--	--	--	0.050	U	--	**82.8**	--	--	**24.5**	--	--	**0.110**	J	--	**14.3**	--	--	--	--	--	**2.42**	--	--
DC-07	YVD-092517-12	9/25/2017	N	K1710333	**235**	--	--	**235**	--	--	--	--	--	0.050	U	--	**86.1**	--	--	**25.4**	--	--	**0.090**	J	--	**13.9**	--	--	--	--	--	**2.34**	--	--
DC-07	YVD-120417-14	12/4/2017	N	K1713026	**221**	--	--	**221**	--	--	--	--	--	0.050	U	--	**80.9**	--	--	**25.7**	--	--	**0.180**	J	--	**13.3**	--	--	--	--	--	**2.92**	--	--
DC-07	YVD-060318-17	6/3/2018	N	874568	**202**	--	--	**202**	--	--	0.070	U	--	--	--	--	**90.5**	--	--	**28.5**	--	--	0.100	U	--	**15.9**	--	--	--	--	--	**6.90**	--	--
DC-07	YVD-060319-20	6/3/2019	N	992053	**349**	--	--	**349**	--	--	0.070	U	--	--	--	--	**120**	--	--	**20.4**	--	--	0.100	U	--	**20.2**	--	--	--	--	--	**2.95**	--	--
DC-07	YVD-060920-18	6/9/2020	N	009269	**468**	--	--	**468**	--	--	0.070	U	--	--	--	--	**174**	--	--	**48.8**	--	--	0.100	U	--	**27.0**	--	--	--	--	--	**10.1**	--	--
DC-07	YVD-092120-22	9/21/2020	N	013896	**500**	--	--	**500**	--	--	0.070	U	--	--	--	--	**194**	--	--	**62.3**	--	--	0.100	U	--	**29.0**	--	--	--	--	--	**26.5**	--	--
DC-07	YVD-120820-22	12/8/2020	N	017137	**507**	--	--	**507**	--	--	0.070	U	--	--	--	--	**172**	--	--	**40.6**	--	--	**0.110**	--	--	**26.0**	--	--	--	--	--	**13.4**	--	--
DC-07	YVD-030121-10	3/1/2021	N	119931	**500**	--	--	**500**	--	--	0.070	U	--	--	--	--	**169**	--	--	**35.1**	--	--	0.100	U	--	**26.6**	--	--	--	--	--	**5.80**	--	--
DC-07	YVD-060721-16	6/7/2021	N	124105	**490**	--	--	**490**	--	--	0.070	U	--	--	--	--	**152**	--	--	**23.1**	--	--	0.100	U	--	**23.6**	--	--	--	--	--	**8.80**	--	--
DC-07	YVD-060721-17	6/7/2021	FD	124105	**490**	--	--	**490**	--	--	0.070	U	--	--	--	--	**150**	--	--	**23.2**	--	--	0.100	U	--	**23.4**	--	--	--	--	--	**9.90**	--	--
DC-07	YVD-121521-17	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**20.3**	J	HTQ, MS
DC-07	YVD-031522-13	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**20.1**	--	--
DC-07	YVD-060522-08	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**28.5**	--	--
DC-07	YVD-091422-16	9/14/2022	N	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**18.3**	--	--
DC-07	YVD-091422-17	9/14/2022	FD	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**18.5**	--	--
DC-07	YVD-122722-23	12/27/2022	N	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**6.20**	--	--
DC-07	YVD-030623-12	3/6/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**6.22**	--	--	--	--	--
DC-07	YVD-062123-27	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**2.50**	J	HTQ
DC-07	YVD-091123-14	9/11/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**4.40**	--	--
DC-07	YVD-120423-10	12/4/2023	N	K2313548	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**2.92**	--	--
DC-09	DC-09-130103	01/03/2013	N	EPA01	--	--	--	--	--	--	--	--	--	0.100	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**6.00**	--	--
DC-09	DC-09-130923	09/23/2013	N	SWI0178	**44.7**	--	--	**45.0**	--	--	--	--	--	0.100	U	--	**34.0**	--	--	--	--	--	--	--	--	**8.41**	--	--	--	--	--	--	--	--
DC-09	DC-09-130926	09/26/2013	N	SWI0190	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**16.2**	--	--	0.500	U	--	--	--	--	--	--	--	**6.02**	--	--
DC-09	DC-09-131211	12/11/2013	N	SWL0063	**129**	--	--	**130**	--	--	--	--	--	--	R	MSD	**34.8**	--	--	**17.4**	--	--	0.500	U	--	**7.89**	--	--	--	--	--	**6.78**	--	--
DC-09	DC-09-140317	03/17/2014	N	SXC0095	**144**	--	--	**145**	--	--	--	--	--	0.100	U	--	**35.4**	--	--	**15.6**	--	--	**0.820**	--	--	**8.43**	--	--	--	--	--	**5.85**	--	--
DC-09	DC-09-140602	06/02/2014	N	SXF0008	**129**	--	--	**130**	--	--	--	--	--	**0.106**	--	--	**33.9**	--	--	**15.9**	--	--	0.500	U	--	**8.27**	--	--	--	--	--	**6.18**	--	--
DC-09	YVD-D3-140602	06/02/2014	FD	SXF0008	**129**	--	--	**130**	--	--	--	--	--	0.100	U	--	**34.2**	--	--	**15.8**	--	--	0.500	U	--	**8.73**	--	--	--	--	--	**5.97**	--	--
DC-09	DC-09-140923	09/23/2014	N	SXI0158	**124**	--	--	**125**	--	--	--	--	--	--	R	MSD	**32.2**	--	--	**15.8**	--	--	0.500	U	--	**6.75**	--	--	--	--	--	**6.01**	--	--
DC-09	DC-09-141216	12/16/2014	N	SXL0108	**129**	--	--	**130**	--	--	--	--	--	0.100	U	--	**35.3**	--	--	**16.3**	--	--	0.500	U	--	**7.98**	--	--	--	--	--	**5.94**	--	--
DC-09	DC-09-150316	03/16/2015	N	5904541	**130**	--	--	**130**	--	--	--	--	--	**0.150**	--	--	**36.0**	--	--	**17.0**	--	--	**0.600**	--	--	**8.00**	--	--	--	--	--	**5.90**	J-	MSD
DC-09	DC-09-150616	06/16/2015	N	59010751	**130**	--	--	**130**	--	--	--	--	--	0.100	U	--	**34.0**	J+	MSD	**16.0**	--	--	0.500	U	--	**8.10**	J+	MSD	--	--	--	**5.80**	--	--
DC-09	DC-09-150923	09/23/2015	N	59020281	**140**	--	--	**140**	--	--	--	--	--	0.100	U	--	**33.0**	--	--	**16.0**	--	--	0.500	U	--	**8.10**	--	--	--	--	--	**5.80**	--	--
DC-09	DC-09-151214	12/14/2015	N	59025431	**150**	J	FDP	**150**	J	FDP	--	--	--	--	R	MSD	**34.0**	--	--	**16.0**	--	--	0.500	U	--	**8.20**	--	--	--	--	--	**5.90**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			EPA 350.1			SM 4500 NH3--G			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-09	DC-09-160308	03/08/2016	N	59029711	**130**	--	--	**130**	--	--	--	--	--	--	R	FBK, FDP	**35.0**	--	--	**16.0**	--	--	0.500	U	--	**8.80**	--	--	--	--	--	**5.70**	--	--
DC-09	YVD-D2-160308	03/08/2016	FD	59029711	**130**	--	--	**130**	--	--	--	--	--	0.100	UJ	FDP	**34.0**	--	--	**16.0**	--	--	0.500	U	--	**8.60**	--	--	--	--	--	**5.70**	--	--
DC-09	DC-09-160621	6/21/2016	N	59037151	**130**	--	--	**130**	--	--	--	--	--	0.100	UJ	--	**32.0**	--	--	**17.0**	--	--	**0.510**	--	--	**7.50**	--	--	--	--	--	**5.90**	--	--
DC-09	DC-09-160929	9/29/2016	N	K1611704	**129**	--	--	**129**	--	--	--	--	--	0.050	U	MBK	**30.6**	--	--	**14.8**	--	--	**0.380**	--	--	**6.25**	--	--	--	--	--	**5.53**	--	--
DC-09	DC-09-D4-160929	9/29/2016	FD	K1611704	**128**	--	--	**128**	--	--	--	--	--	0.050	U	MBK	**30.4**	--	--	**14.9**	--	--	**0.380**	--	--	**6.22**	--	--	--	--	--	**5.53**	--	--
DC-09	DC-09-161215	12/15/2016	N	K1615126	**127**	--	--	**127**	--	--	--	--	--	0.050	U	--	**33.0**	--	--	**15.0**	--	--	**0.410**	--	--	**6.65**	--	--	--	--	--	**5.62**	--	--
DC-09	YVD-D4-161215	12/15/2016	FD	K1615126	**127**	--	--	**127**	--	--	--	--	--	0.050	U	--	**32.8**	--	--	**15.0**	--	--	**0.420**	--	--	**6.62**	--	--	--	--	--	**5.61**	--	--
DC-09	YVD-031317-36	3/13/2017	N	K1702489	**124**	--	--	**124**	--	--	--	--	--	0.050	U	--	**33.8**	--	--	**14.6**	--	--	**0.440**	--	--	**6.75**	--	--	--	--	--	**5.54**	--	--
DC-09	YVD-060717-27	6/7/2017	N	K1705833	**126**	--	--	**126**	--	--	--	--	--	0.050	U	--	**33.3**	--	--	**14.7**	--	--	**0.400**	--	--	**6.88**	--	--	--	--	--	**5.55**	--	--
DC-09	YVD-092617-23	9/26/2017	N	K1710333	**132**	--	--	**132**	--	--	--	--	--	0.050	U	--	**32.9**	--	--	**14.7**	--	--	**0.400**	--	--	**6.71**	--	--	--	--	--	**5.47**	--	--
DC-09	YVD-120417-09	12/4/2017	N	K1713026	**129**	--	--	**129**	--	--	--	--	--	0.050	U	--	**33.0**	--	--	**15.1**	--	--	**0.430**	--	--	**6.50**	--	--	--	--	--	**5.80**	--	--
DC-09	YVD-060418-25	6/4/2018	N	874860	**127**	--	--	**127**	--	--	0.070	U	--	--	--	--	**33.4**	--	--	**14.1**	--	--	**0.390**	--	--	**7.30**	--	--	--	--	--	**5.29**	--	--
DC-09	YVD-060319-19	6/3/2019	N	992053	**128**	--	--	**128**	--	--	0.070	U	--	--	--	--	**34.5**	--	--	**13.1**	--	--	**0.390**	--	--	**7.25**	--	--	--	--	--	**5.23**	--	--
DC-09	YVD-060920-25	6/9/2020	N	009269	**128**	--	--	**128**	--	--	0.070	U	--	--	--	--	**34.0**	--	--	**14.4**	--	--	**0.350**	--	--	**7.15**	--	--	--	--	--	**5.60**	--	--
DC-09	YVD-060721-15	6/7/2021	N	124105	**129**	--	--	**129**	--	--	0.070	U	--	--	--	--	**34.4**	--	--	**14.8**	--	--	**0.380**	--	--	**7.35**	--	--	--	--	--	**6.20**	--	--
DC-09	YVD-060722-29	6/7/2022	N	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**6.76**	J	HTQ
DC-09	YVD-062123-22	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**6.23**	J	HTQ
DC-09	YVD-062123-23	6/21/2023	FD	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**5.92**	J	HTQ
DC-14	DC-14-130103	01/03/2013	N	EPA01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**26.0**	--	--
DC-14	DC-14-130917	09/17/2013	N	SWI0113	**454**	--	--	**455**	--	--	--	--	--	**0.115**	--	--	**121**	--	--	**80.2**	--	--	0.500	U	--	**32.3**	--	--	--	--	--	**12.0**	--	--
DC-14	DC-14-131211	12/11/2013	N	SWL0063	**434**	--	--	**435**	--	--	--	--	--	--	R	MSD	**91.2**	--	--	**64.4**	--	--	5.00	U	--	**23.9**	--	--	--	--	--	**5.80**	--	--
DC-14	DC-14-140318	03/18/2014	N	SXC0095	**494**	--	--	**495**	--	--	--	--	--	0.100	U	--	**107**	--	--	**71.8**	--	--	5.00	U	--	**28.4**	--	--	--	--	--	**10.6**	--	--
DC-14	DC-14-140602	06/02/2014	N	SXF0017	**425**	--	--	**425**	--	--	--	--	--	0.100	U	--	**95.9**	--	--	**56.1**	--	--	1.00	U	--	**26.3**	--	--	--	--	--	**6.46**	--	--
DC-14	DC-14-140923	09/23/2014	N	SXI0158	**424**	--	--	**425**	--	--	--	--	--	--	R	MSD	**106**	--	--	**63.7**	--	--	1.00	U	--	**27.6**	--	--	--	--	--	**8.90**	--	--
DC-14	DC-14-141216	12/16/2014	N	SXL0108	**429**	--	--	**430**	--	--	--	--	--	0.100	U	--	**110**	--	--	**74.4**	--	--	1.00	U	--	**31.5**	--	--	--	--	--	**10.4**	--	--
DC-14	DC-14-150316	03/16/2015	N	5904541	**490**	--	--	**490**	--	--	--	--	--	**0.160**	--	--	**140**	--	--	**80.0**	--	--	1.00	U	--	**38.0**	--	--	--	--	--	**18.0**	J-	MSD
DC-14	DC-14-150616	06/16/2015	N	59010961	**430**	--	--	**430**	--	--	--	--	--	0.100	U	--	**120**	--	--	**76.0**	--	--	1.00	U	--	**33.0**	--	--	--	--	--	**12.0**	--	--
DC-14	DC-14-150924	09/24/2015	N	59020391	**470**	--	--	**470**	--	--	--	--	--	0.100	UJ	MSD	**130**	--	--	**96.0**	--	--	1.00	U	--	**42.0**	--	--	--	--	--	**22.0**	J+	MSD
DC-14	DC-14-151214	12/14/2015	N	59025351	**550**	--	--	**550**	--	--	--	--	--	--	R	MSD	**150**	--	--	**90.0**	--	--	1.00	U	--	**43.0**	--	--	--	--	--	**21.0**	--	--
DC-14	YVD-D1-151214	12/14/2015	FD	59025351	**540**	--	--	**540**	--	--	--	--	--	--	R	MSD	**150**	--	--	**85.0**	--	--	0.500	U	--	**43.0**	--	--	--	--	--	**22.0**	--	--
DC-14	DC-14-160309	03/09/2016	N	59029711	**490**	--	--	**490**	--	--	--	--	--	0.100	UJ	FDP	**130**	--	--	**82.0**	--	--	1.00	U	--	**38.0**	--	--	--	--	--	**16.0**	--	--
DC-14	DC-14-160620	6/20/2016	N	59037151	**460**	--	--	**460**	--	--	--	--	--	0.100	U	--	**120**	--	--	**75.0**	--	--	1.00	U	--	**36.0**	--	--	--	--	--	**16.0**	--	--
DC-14	DC-14-160929	9/29/2016	N	K1611704	**394**	--	--	**394**	--	--	--	--	--	0.050	U	MBK	**97.2**	--	--	**56.4**	--	--	**0.300**	--	--	**28.9**	--	--	--	--	--	**7.19**	--	--
DC-14	DC-14-161216	12/16/2016	N	K1615174	**361**	--	--	**361**	--	--	--	--	--	0.050	U	--	**93.3**	--	--	**53.9**	--	--	**0.360**	--	--	**22.3**	--	--	--	--	--	**4.45**	--	--
DC-14	YVD-031317-38	3/14/2017	N	K1702542	**359**	--	--	**359**	--	--	--	--	--	0.050	U	--	**91.0**	--	--	**49.6**	--	--	**0.340**	--	--	**24.4**	--	--	--	--	--	**4.34**	--	--
DC-14	YVD-060617-19	6/6/2017	N	K1705754	**386**	--	--	**386**	--	--	--	--	--	0.050	U	--	**97.7**	--	--	**49.2**	--	--	**0.340**	--	--	**24.4**	--	--	--	--	--	**3.86**	--	--
DC-14	YVD-092517-11	9/25/2017	N	K1710274	**382**	--	--	**382**	--	--	--	--	--	0.050	U	--	**98.2**	--	--	**43.3**	--	--	**0.340**	--	--	**24.5**	--	--	--	--	--	**2.41**	--	--
DC-14	YVD-120617-27	12/6/2017	N	K1713157	**378**	--	--	**378**	--	--	--	--	--	0.050	U	MBK	**100**	--	--	**46.4**	--	--	**0.350**	--	--	**23.5**	--	--	--	--	--	**2.52**	--	--
DC-14	YVD-120617-29	12/6/2017	FD	K1713157	**372**	--	--	**372**	--	--	--	--	--	0.050	U	--	**97.7**	--	--	**46.0**	--	--	**0.340**	--	--	**22.8**	--	--	--	--	--	**2.52**	--	--
DC-14	YVD-031918-20	3/19/2018	N	870634	**372**	--	--	**372**	--	--	0.070	U	--	--	--	--	**95.0**	--	--	**47.9**	--	--	**0.310**	--	--	**22.6**	--	--	--	--	--	**2.86**	--	--
DC-14	YVD-060518-28	6/5/2018	N	874860	**370**	--	--	**370**	--	--	0.070	U	--	--	--	--	**92.0**	--	--	**56.5**	--	--	**0.310**	--	--	**23.5**	--	--	--	--	--	**4.00**	--	--
DC-14	YVD-060518-30	6/5/2018	FD	874860	--	R	PRS	--	R	PRS	0.070	U	--	--	--	--	**97.5**	--	--	--	R	PRS	--	R	PRS	**24.6**	--	--	--	--	--	--	R	PRS
DC-14	YVD-090918-08	9/9/2018	N	880601	**368**	--	--	**368**	--	--	0.070	U	--	--	--	--	**104**	--	--	**63.5**	--	--	**0.290**	--	--	**25.0**	--	--	--	--	--	**4.08**	--	--
DC-14	YVD-090918-10	9/9/2018	FD	880601	**363**	--	--	**363**	--	--	0.070	U	--	--	--	--	**105**	--	--	**70.8**	--	--	**0.290**	--	--	**25.1**	--	--	--	--	--	**4.00**	--	--
DC-14	YVD-121018-07	12/10/2018	N	884857	**376**	--	--	**376**	--	--	0.070	U	--	--	--	--	**105**	--	--	**72.8**	--	--	0.280	U	FBK	**25.7**	J	MSD	--	--	--	**4.60**	--	--
DC-14	YVD-031719-09	3/17/2019	N	988239	**395**	--	--	**395**	--	--	0.070	U	--	--	--	--	**118**	--	--	**83.8**	--	--	0.250	U	FBK	**27.8**	--	--	--	--	--	**5.00**	--	--
DC-14	YVD-060319-17	6/3/2019	N	992053	**395**	--	--	**395**	--	--	0.070	U	--	--	--	--	**122**	--	--	**79.7**	--	--	**0.220**	--	--	**29.7**	--	--	--	--	--	**5.35**	--	--
DC-14	YVD-091019-18	9/10/2019	N	998438	**427**	--	--	**427**	--	--	0.070	U	--	--	--	--	**132**	--	--	**89.5**	--	--	**0.240**	--	--	**32.3**	--	--	--	--	--	**7.70**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			EPA 350.1			SM 4500 NH3--G			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-14	YVD-120919-14	12/9/2019	N	902276	**438**	--	--	**438**	--	--	0.070	U	--	--	--	--	**134**	--	--	**95.2**			**0.320**			**32.9**	--	--	--	--	--	**8.00**	--	--
DC-14	YVD-033120-19	3/31/2020	N	006260	**451**	--	--	**451**	--	--	0.070	U	--	--	--	--	**134**	--	--	**87.6**	--	--	**0.240**	--	--	**32.5**	--	--	--	--	--	**9.50**	--	--
DC-14	YVD-033120-21	3/31/2020	FD	006260	**448**	--	--	**448**	--	--	0.070	U	--	--	--	--	**136**	--	--	**87.7**	--	--	**0.260**	--	--	**33.1**	--	--	--	--	--	**9.60**	--	--
DC-14	YVD-061020-32	6/10/2020	N	009361	**437**	--	--	**437**	--	--	0.070	U	--	--	--	--	**138**	--	--	**84.9**	--	--	**0.230**	--	--	**33.7**	J	MS	--	--	--	**11.5**	--	--
DC-14	YVD-061020-33	6/10/2020	FD	009361	**461**	--	--	**461**	--	--	0.070	U	--	--	--	--	**139**	--	--	**87.3**	--	--	**0.220**	--	--	**33.3**	J	MS	--	--	--	**12.0**	--	--
DC-14	YVD-092120-23	9/21/2020	N	013896	**472**	--	--	**472**	--	--	0.070	U	--	--	--	--	**150**	--	--	**90.5**	--	--	**0.210**	--	--	**36.1**	--	--	--	--	--	**17.3**	--	--
DC-14	YVD-120820-21	12/8/2020	N	017137	**496**	--	--	**496**	--	--	0.070	U	--	--	--	--	**174**	--	--	**89.4**	--	--	**0.180**	--	--	**41.5**	--	--	--	--	--	**23.6**	--	--
DC-14	YVD-030121-09	3/1/2021	N	119931	**517**	--	--	**517**	--	--	0.070	U	--	--	--	--	**186**	--	--	**90.9**	--	--	**0.240**	--	--	**44.3**	--	--	--	--	--	**31.2**	--	--
DC-14	YVD-060821-33	6/8/2021	N	124212	**563**	--	--	**563**	--	--	0.070	U	--	--	--	--	**196**	--	--	**93.4**	--	--	**0.140**	--	--	**47.1**	--	--	--	--	--	**40.2**	--	--
DC-14	YVD-121521-19	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**51.4**	J	HTQ, MS
DC-14	YVD-031522-16	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**48.8**	--	--
DC-14	YVD-060722-28	6/7/2022	N	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**57.4**	J	HTQ
DC-14	YVD-091422-18	9/14/2022	N	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**55.0**	--	--
DC-14	YVD-122822-24	12/28/2022	N	K2215296	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**55.7**	--	--
DC-14	YVD-030623-16	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**52.0**	--	--	--	--	--
DC-14	YVD-062023-12	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**50.5**	J	HTQ
DC-14	YVD-091123-10	9/11/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**49.9**	--	--
DC-14	YVD-120623-04	12/6/2023	N	K2313796	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**43.0**	J	HTQ
YVD-02	YVD-02-130924	09/24/2013	N	SWI0178	**54.9**	--	--	**55.0**	--	--	--	--	--	**0.146**	--	--	**20.4**	--	--	**3.85**	--	--	0.500	U	--	**5.89**	--	--	--	--	--	**0.410**	--	--
YVD-02	YVD-02-140316	03/16/2014	N	SXC0081	**199**	--	--	**200**	--	--	--	--	--	0.100	U	--	**90.8**	--	--	**3.93**	--	--	**1.02**	--	--	**71.7**	--	--	--	--	--	0.200	U	--
YVD-02	YVD-02-140602	06/02/2014	N	SXF0008	**82.2**	--	--	**82.5**	--	--	--	--	--	0.100	U	--	**62.7**	--	--	**2.75**	--	--	0.500	U	--	**48.7**	--	--	--	--	--	0.200	U	--
YVD-02	YVD-02-140921	09/21/2014	N	SXI0148	**89.4**	--	--	**90.0**	--	--	--	--	--	0.100	U	--	**29.6**	--	--	**2.64**	--	--	0.500	U	--	**13.7**	J	FDP	--	--	--	0.200	U	--
YVD-02	YVD-D1-140921	09/21/2014	FD	SXI0148	**89.4**	--	--	**90.0**	--	--	--	--	--	0.100	U	--	**35.8**	--	--	**2.20**	--	--	0.500	U	--	**18.2**	J	FDP	--	--	--	0.200	U	--
YVD-02	YVD-02-141215	12/15/2014	N	SXL0103	**94.7**	--	--	**95.0**	--	--	--	--	--	0.100	U	--	**35.7**	--	--	**2.90**	J+	MSD	0.500	U	--	**17.4**	--	--	--	--	--	**0.220**	J	DUP
YVD-02	YVD-02-150615	06/15/2015	N	59010751	**75.0**	J+	FBK	**75.0**	J+	FBK	--	--	--	**0.110**	--	--	**32.0**	J+	MSD	**2.60**	--	--	0.500	U	--	**16.0**	J+	MSD	--	--	--	**0.230**	--	--
YVD-02	YVD-02-150923	09/23/2015	N	59020281	**95.0**	--	--	**95.0**	--	--	--	--	--	0.100	U	--	**28.0**	--	--	**2.50**	--	--	0.500	U	--	**17.0**	--	--	--	--	--	0.200	U	--
YVD-02	YVD-02-151214	12/14/2015	N	59025351	**100.0**	--	--	**100.0**	--	--	--	--	--	--	R	MSD	**38.0**	--	--	**2.60**	--	--	0.500	U	--	**23.0**	--	--	--	--	--	0.200	U	--
YVD-02	YVD-02-160308	03/08/2016	N	59029521	**110**	J	FDP	**110**	J	FDP	--	--	--	0.100	UJ	RPD	**32.0**	--	--	**3.00**	--	--	**0.570**	--	--	**20.0**	--	--	--	--	--	0.200	U	--
YVD-02	YVD-02-160620	6/20/2016	N	59037101	**75.0**	--	--	**75.0**	--	--	--	--	--	0.100	U	--	**25.0**	--	--	**2.90**	--	--	0.500	U	--	**10.0**	--	--	--	--	--	**0.310**	--	--
YVD-02	YVD-02-160928	9/28/2016	N	K1611629	**72.0**	--	--	**72.0**	--	--	--	--	--	0.050	U	MBK	**17.2**	--	--	**2.79**	J	DUP	**0.160**	J	--	**4.64**	--	--	--	--	--	**0.130**	--	--
YVD-02	YVD-030817-15	3/8/2017	N	K1702324	**103**	--	--	**103**	--	--	--	--	--	1.00	U	--	**30.2**	--	--	**3.85**	--	--	**0.210**	--	--	**7.22**	--	--	--	--	--	**5.40**	--	--
YVD-02	YVD-060617-14	6/6/2017	N	K1705754	**81.0**	--	--	**81.0**	--	--	--	--	--	0.050	U	--	**20.9**	--	--	**3.03**	--	--	**0.160**	J	--	**4.85**	--	--	--	--	--	**0.200**	--	--
YVD-02	YVD-060617-16	6/6/2017	FD	K1705754	**67.0**	--	--	**67.0**	--	--	--	--	--	0.050	U	--	**20.2**	--	--	**2.95**	--	--	**0.150**	J	--	**4.74**	--	--	--	--	--	**0.200**	--	--
YVD-02	YVD-092617-20	9/26/2017	N	K1710333	**75.0**	--	--	**75.0**	--	--	--	--	--	0.050	U	--	**17.7**	--	--	**2.63**	--	--	**0.150**	J	--	**4.64**	--	--	--	--	--	**0.170**	--	--
YVD-02	YVD-120417-02	12/4/2017	N	K1713026	**89.0**	--	--	**89.0**	--	--	--	--	--	0.050	U	--	**20.0**	--	--	**2.37**	--	--	**0.290**	--	--	**7.43**	--	--	--	--	--	**0.220**	--	--
YVD-02	YVD-120417-04	12/4/2017	FD	K1713026	**93.0**	--	--	**93.0**	--	--	--	--	--	0.050	U	--	**19.6**	--	--	**2.20**	--	--	**0.310**	--	--	**7.74**	--	--	--	--	--	**0.200**	--	--
YVD-02	YVD-061218-32	6/12/2018	N	875438	--	R	NR	--	R	NR	--	R	NR	--	--	--	--	R	NR	--	R	NR	--	R	NR	--	R	NR	--	--	--	--	R	NR
YVD-02	YVD-060419-28	6/4/2019	N	992242	**191**	--	--	**191**	--	--	0.070	U	--	--	--	--	**54.0**	--	--	**12.5**	--	--	**0.180**	--	--	**19.6**	--	--	--	--	--	**33.9**	J	HTQ
YVD-02	YVD-070219-33	7/2/2019	N	994356	**204**	--	--	**204**	--	--	0.070	U	--	--	--	--	**87.0**	--	--	**13.0**	--	--	**0.190**	--	--	**32.4**	--	--	--	--	--	**36.1**	--	--
YVD-02	YVD-091019-19	9/10/2019	N	998438	**200**	--	--	**200**	--	--	0.070	U	--	--	--	--	**97.0**	--	--	**11.3**	--	--	**0.130**	--	--	**27.0**	--	--	--	--	--	**43.6**	--	--
YVD-02	YVD-121019-23	12/10/2019	N	902321	**226**	--	--	**226**	--	--	0.070	U	--				**85.0**	--	--	**11.6**	--	--	**0.330**	--	--	**31.6**	--	--	--	--	--	**38.9**	--	--
YVD-02	YVD-040120-23	4/1/2020	N	006311	**237**	--	--	**237**	--	--	0.070	U	--	--	--	--	**59.5**	--	--	**11.7**	--	--	**0.550**	--	--	**25.4**	--	--	--	--	--	**20.6**	--	--
YVD-02	YVD-061120-35	6/11/2020	N	009430	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**15.5**	--	--
YVD-02	NS[1]	9/21/2020	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	12/8/2020	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	3/1/2021	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	6/8/2021	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	12/15/2021	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			EPA 350.1			SM 4500 NH3--G			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-02	NS[1]	3/15/2022	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	6/7/2022	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	9/12/2022	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	12/5/2022	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	3/6/2023	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	6/20/2023	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	9/10/2023	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	12/4/2023	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-03	YVD-03-130916	09/16/2013	N	SWI0113	**209**	--	--	**210**	--	--	--	--	--	0.100	U	--	**57.5**	--	--	**14.0**	--	--	**0.740**	--	--	**24.3**	--	--	--	--	--	**4.75**	--	--
YVD-03	YVD-03-131210	12/10/2013	N	SWL0063	**214**	--	--	**215**	--	--	--	--	--	--	R	MSD	**48.7**	--	--	**14.3**	--	--	1.00	U	--	**20.4**	--	--	--	--	--	**5.96**	--	--
YVD-03	YVD-03-140317	03/17/2014	N	SXC0081	**219**	--	--	**220**	--	--	--	--	--	**0.249**	--	--	**51.2**	--	--	**13.3**	--	--	**1.03**	--	--	**18.2**	--	--	--	--	--	**4.75**	--	--
YVD-03	YVD-03-140602	06/02/2014	N	SXF0008	**206**	--	--	**208**	--	--	--	--	--	0.100	U	--	**46.4**	--	--	**10.7**	--	--	0.500	U	--	**16.8**	--	--	--	--	--	**3.86**	--	--
YVD-03	YVD-03-140923	09/23/2014	N	SXI0158	**199**	--	--	**200**	--	--	--	--	--	--	R	MSD	**52.2**	--	--	**11.8**	--	--	**0.620**	--	--	**19.5**	--	--	--	--	--	**3.97**	--	--
YVD-03	YVD-D3-140923	09/23/2014	FD	SXI0158	**199**	--	--	**200**	--	--	--	--	--	--	R	MSD	**45.4**	--	--	**12.1**	--	--	**0.650**	--	--	**16.2**	--	--	--	--	--	**4.04**	--	--
YVD-03	YVD-03-141215	12/15/2014	N	SXL0108	**199**	--	--	**200**	--	--	--	--	--	0.100	U	--	**51.7**	--	--	**12.9**	--	--	**0.540**	--	--	**19.3**	--	--	--	--	--	**4.27**	--	--
YVD-03	YVD-03-150316	03/16/2015	N	5904541	**210**	--	--	**210**	--	--	--	--	--	0.100	U	--	**46.0**	--	--	**13.0**	--	--	**0.840**	--	--	**17.0**	--	--	--	--	--	**4.10**	J-	MSD
YVD-03	YVD-03-150616	06/16/2015	N	59010751	**200**	--	--	**200**	--	--	--	--	--	**0.120**	--	--	**50.0**	J+	MSD	**12.0**	--	--	**0.680**	--	--	**20.0**	J+	MSD	--	--	--	**4.00**	--	--
YVD-03	YVD-03-150922	09/22/2015	N	59020141	**220**	--	--	**220**	--	--	--	--	--	0.100	U	--	**43.0**	--	--	**14.0**	--	--	**0.660**	--	--	**19.0**	--	--	--	--	--	**4.90**	--	--
YVD-03	YVD-03-151214	12/14/2015	N	59025351	**230**	--	--	**230**	--	--	--	--	--	--	R	MSD	**49.0**	--	--	**14.0**	--	--	**0.740**	--	--	**22.0**	--	--	--	--	--	**4.90**	--	--
YVD-03	YVD-03-160307	03/07/2016	N	59029521	**150**	J	FDP	**150**	J	FDP	--	--	--	0.100	UJ	RPD	**43.0**	--	--	**13.0**	--	--	**0.720**	--	--	**20.0**	--	--	--	--	--	**4.60**	--	--
YVD-03	YVD-03-160620	6/20/2016	N	59037151	**190**	--	--	**190**	--	--	--	--	--	0.100	U	--	**46.0**	--	--	**14.0**	--	--	**0.760**	--	--	**21.0**	--	--	--	--	--	**4.60**	--	--
YVD-03	YVD-03-160929	9/29/2016	N	K1611758	**196**	--	--	**196**	--	--	--	--	--	0.050	U	MBK	**43.2**	--	--	**11.7**	--	--	**0.610**	--	--	**18.3**	--	--	--	--	--	**4.39**	--	--
YVD-03	YVD-03-161213	12/13/2016	N	K1615045	**189**	--	--	**189**	--	--	--	--	--	0.050	U	--	**40.0**	--	--	**11.6**	--	--	**0.690**	--	--	**17.4**	--	--	--	--	--	**4.47**	--	--
YVD-03	YVD-030617-02	3/6/2017	N	K1702228	**190**	--	--	**190**	--	--	--	--	--	0.050	U	--	**41.6**	--	--	**11.4**	--	--	**0.600**	--	--	**17.3**	--	--	--	--	--	**4.42**	--	--
YVD-03	YVD-030617-03	3/6/2017	FD	K1702228	**192**	--	--	**192**	--	--	--	--	--	0.050	U	--	**41.5**	--	--	**11.6**	--	--	**0.650**	--	--	**17.3**	--	--	--	--	--	**4.48**	--	--
YVD-03	YVD-060517-13	6/5/2017	N	K1705702	**189**	--	--	**189**	--	--	--	--	--	0.050	U	--	**41.9**	--	--	**11.9**	--	--	**0.660**	--	--	**18.1**	--	--	--	--	--	**4.61**	--	--
YVD-03	YVD-092517-05	9/25/2017	N	K1710274	**193**	--	--	**193**	--	--	--	--	--	0.050	U	--	**41.6**	--	--	**11.6**	--	--	**0.660**	--	--	**18.7**	--	--	--	--	--	**4.45**	--	--
YVD-03	YVD-120517-19	12/5/2017	N	K1713091	**181**	--	--	**181**	--	--	--	--	--	0.050	U	--	**41.9**	--	--	**11.1**	--	--	**0.640**	--	--	**17.4**	--	--	--	--	--	**4.52**	--	--
YVD-03	YVD-060518-27	6/5/2018	N	874860	**188**	--	--	**188**	--	--	0.070	U	--	--	--	--	**39.0**	--	--	**11.3**	--	--	**0.620**	--	--	**17.4**	--	--	--	--	--	**4.70**	--	--
YVD-03	YVD-060219-07	6/2/2019	N	991939	**185**	--	--	**185**	--	--	0.070	U	--	--	--	--	**40.3**	--	--	8.19	U	FBK	0.440	U	FBK	**17.2**	--	--	--	--	--	**3.16**	--	--
YVD-03	YVD-060820-09	6/8/2020	N	009144	**184**	--	--	**184**	--	--	0.070	U	--	--	--	--	**40.5**	--	--	**11.6**	--	--	**0.560**	--	--	**17.6**	--	--	--	--	--	**5.20**	--	--
YVD-03	YVD-060821-24	6/8/2021	N	124212	**182**	--	--	**182**	--	--	0.070	U	--	--	--	--	**42.2**	--	--	**8.09**	--	--	**0.370**	--	--	**17.8**	--	--	--	--	--	**3.23**	--	--
YVD-03	YVD-060822-31	6/8/2022	N	K2206299	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**5.08**	--	--
YVD-03	YVD-060822-32	6/8/2022	FD	K2206299	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**5.10**	--	--
YVD-03	YVD-061923-04	6/19/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**4.97**	J	HTQ
YVD-04	YVD-04-130916	09/16/2013	N	SWI0113	**184**	--	--	**185**	--	--	--	--	--	0.100	U	--	**37.4**	--	--	**14.9**	--	--	0.500	U	--	**11.2**	--	--	--	--	--	**4.45**	--	--
YVD-04	YVD-04-131210	12/10/2013	N	SWL0063	**203**	--	--	**205**	--	--	--	--	--	--	R	MSD	**38.2**	--	--	**15.0**	--	--	1.00	U	--	**11.7**	--	--	--	--	--	**4.64**	--	--
YVD-04	YVD-04-140317	03/17/2014	N	SXC0081	**209**	--	--	**210**	--	--	--	--	--	0.100	U	--	**37.7**	--	--	**15.1**	--	--	**0.630**	--	--	**11.6**	--	--	--	--	--	**4.03**	--	--
YVD-04	YVD-04-140602	06/02/2014	N	SXF0008	**191**	--	--	**193**	--	--	--	--	--	**0.113**	--	--	**36.8**	--	--	**14.3**	--	--	1.00	U	--	**11.5**	--	--	--	--	--	**3.78**	--	--
YVD-04	YVD-04-140923	09/23/2014	N	SXI0158	**188**	--	--	**190**	--	--	--	--	--	--	R	MSD	**37.8**	--	--	**15.3**	--	--	0.500	U	--	**11.5**	--	--	--	--	--	**3.87**	--	--
YVD-04	YVD-04-141215	12/15/2014	N	SXL0108	**188**	--	--	**190**	--	--	--	--	--	0.100	U	--	**38.8**	--	--	**15.2**	--	--	0.500	U	--	**12.4**	--	--	--	--	--	**3.81**	--	--
YVD-04	YVD-04-150315	03/15/2015	N	5904471	**190**	--	--	**190**	--	--	--	--	--	0.100	U	--	**38.0**	--	--	**16.0**	--	--	0.500	U	--	**12.0**	--	--	--	--	--	**4.30**	--	--
YVD-04	YVD-04-150615	06/15/2015	N	59010751	**190**	--	--	**190**	--	--	--	--	--	0.100	U	--	**38.0**	J+	MSD	**15.0**	--	--	0.500	U	--	**8.50**	J+	MSD	--	--	--	**4.00**	--	--
YVD-04	YVD-04-150922	09/22/2015	N	59020141	**200**	--	--	**200**	--	--	--	--	--	**0.130**	--	--	**36.0**	--	--	**15.0**	--	--	0.500	U	--	**11.0**	--	--	--	--	--	**3.90**	--	--
YVD-04	YVD-04-151213	12/13/2015	N	59025351	**200**	--	--	**200**	--	--	--	--	--	--	R	MSD	**39.0**	--	--	**15.0**	--	--	0.500	U	--	**12.0**	--	--	--	--	--	**4.10**	--	--
YVD-04	YVD-04-160307	03/07/2016	N	59029521	**250**	J	FDP	**250**	J	FDP	--	--	--	0.100	UJ	RPD	**36.0**	--	--	**14.0**	--	--	0.500	U	--	**12.0**	--	--	--	--	--	**3.70**	--	--
YVD-04	YVD-04-160620	6/20/2016	N	59037101	**190**	--	--	**190**	--	--	--	--	--	0.100	U	--	**36.0**	--	--	**15.0**	--	--	0.500	U	--	**12.0**	--	--	--	--	--	**4.00**	--	--
YVD-04	YVD-D1-160620	6/20/2016	FD	59037101	**180**	--	--	**180**	--	--	--	--	--	0.100	U	--	**35.0**	--	--	**15.0**	--	--	0.500	U	--	**12.0**	--	--	--	--	--	**4.00**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			EPA 350.1			SM 4500 NH3--G			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-04	YVD-04-160928	9/28/2016	N	K1611629	**187**	--	--	**187**	--	--	--	--	--	0.050	U	--	**34.7**	--	--	**13.2**	--	--	**0.210**	--	--	**10.7**	--	--	--	--	--	**3.67**	--	--
YVD-04	YVD-04-D3-160928	9/28/2016	FD	K1611629	**185**	--	--	**185**	--	--	--	--	--	0.050	U	MBK	**34.7**	--	--	**13.2**	--	--	**0.200**	--	--	**10.9**	--	--	--	--	--	**3.68**	--	--
YVD-04	YVD-04-161213	12/13/2016	N	K1615045	**181**	--	--	**181**	--	--	--	--	--	0.050	U	--	**35.2**	--	--	**13.2**	--	--	**0.230**	--	--	**10.9**	--	--	--	--	--	**3.74**	--	--
YVD-04	YVD-031017-28	3/10/2017	N	K1702448	**167**	--	--	**167**	--	--	--	--	--	0.050	U	--	**37.8**	--	--	**13.2**	--	--	**0.210**	--	--	**10.9**	--	--	--	--	--	**3.70**	--	--
YVD-04	YVD-060517-11	6/5/2017	N	K1705702	**182**	--	--	**182**	--	--	--	--	--	0.050	U	--	**36.5**	--	--	**13.0**	--	--	**0.220**	--	--	**9.85**	--	--	--	--	--	**3.53**	--	--
YVD-04	YVD-092517-07	9/25/2017	N	K1710274	**188**	--	--	**188**	--	--	--	--	--	0.050	U	--	**37.2**	--	--	**12.9**	--	--	**0.210**	--	--	**11.7**	--	--	--	--	--	**3.57**	--	--
YVD-04	YVD-120417-13	12/4/2017	N	K1713091	**185**	--	--	**185**	--	--	--	--	--	0.050	U	--	**36.5**	--	--	**13.2**	--	--	**0.240**	--	--	**10.9**	--	--	--	--	--	**3.79**	--	--
YVD-04	YVD-060418-21	6/4/2018	N	874662	**179**	--	--	**179**	--	--	0.080	U	FBK	--	--	--	**37.0**	--	--	**12.3**	--	--	**0.190**	--	--	**11.7**	--	--	--	--	--	**4.10**	--	--
YVD-04	YVD-060219-05	6/2/2019	N	991939	**181**	--	--	**181**	--	--	0.070	U	--	--	--	--	**36.2**	--	--	22.9	U	FBK	0.790	U	FBK	**11.1**	--	--	--	--	--	**3.85**	--	--
YVD-04	YVD-060820-05	6/8/2020	N	009144	**182**	--	--	**182**	--	--	0.070	U	--	--	--	--	**34.9**	--	--	**12.7**	--	--	**0.160**	--	--	**10.9**	--	--	--	--	--	**4.10**	--	--
YVD-04	YVD-060821-22	6/8/2021	N	124212	**182**	--	--	**182**	--	--	0.070	U	--	--	--	--	**35.4**	--	--	**12.5**	--	--	**0.160**	--	--	**10.7**	--	--	--	--	--	**3.73**	--	--
YVD-04	YVD-060622-17	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**4.70**	--	--
YVD-04	YVD-061923-03	6/19/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**3.93**	J	HTQ
YVD-05	YVD-05-130917	09/17/2013	N	SWI0113	**184**	--	--	**185**	--	--	--	--	--	**0.112**	--	--	**66.0**	--	--	**10.2**	--	--	0.500	U	--	**31.0**	--	--	--	--	--	**4.90**	--	--
YVD-05	YVD-05-131211	12/11/2013	N	SWL0063	**174**	--	--	**175**	--	--	--	--	--	--	R	MSD	**41.5**	--	--	**10.0**	--	--	1.00	U	--	**17.0**	--	--	--	--	--	**4.36**	--	--
YVD-05	YVD-05-140317	03/17/2014	N	SXC0081	**174**	--	--	**175**	--	--	--	--	--	0.100	U	--	**33.7**	--	--	**8.40**	--	--	**1.30**	--	--	**13.5**	--	--	--	--	--	**3.30**	--	--
YVD-05	YVD-05-140601	06/01/2014	N	SXF0008	**164**	--	--	**165**	--	--	--	--	--	0.100	U	--	**30.8**	--	--	**8.40**	--	--	1.00	U	--	**13.2**	--	--	--	--	--	**3.00**	--	--
YVD-05	YVD-05-140922	09/22/2014	N	SXI0148	**159**	--	--	**160**	--	--	--	--	--	0.100	U	--	**31.6**	--	--	**7.60**	--	--	1.00	U	--	**13.7**	--	--	--	--	--	**2.82**	--	--
YVD-05	YVD-05-141215	12/15/2014	N	SXL0103	**154**	--	--	**155**	--	--	--	--	--	0.100	U	--	**36.9**	--	--	**4.56**	J+	MSD, FDP	1.00	U	--	**17.0**	--	--	--	--	--	**1.50**	J	FDP, DUP
YVD-05	YVD-D1-141215	12/15/2014	FD	SXL0103	**153**	--	--	**155**	--	--	--	--	--	0.100	U	--	**34.2**	--	--	**7.80**	J+	MSD, FDP	0.500	U	--	**15.0**	--	--	--	--	--	**2.65**	J	FDP, DUP
YVD-05	YVD-05-150316	03/16/2015	N	5904471	**160**	--	--	**160**	--	--	--	--	--	0.100	U	--	**33.0**	--	--	**8.00**	--	--	1.00	U	--	**15.0**	--	--	--	--	--	**2.80**	--	--
YVD-05	YVD-05-150616	06/16/2015	N	59010751	**170**	--	--	**170**	--	--	--	--	--	0.100	U	--	**35.0**	J+	MSD	**8.90**	--	--	1.00	U	--	**16.0**	J+	MSD	--	--	--	**3.10**	--	--
YVD-05	YVD-05-150922	09/22/2015	N	59020281	**160**	--	--	**160**	--	--	--	--	--	0.100	U	--	**42.0**	--	--	**8.80**	--	--	1.00	U	--	**20.0**	--	--	--	--	--	**3.00**	--	--
YVD-05	YVD-05-151214	12/14/2015	N	59025351	**180**	--	--	**180**	--	--	--	--	--	--	R	MSD	**37.0**	--	--	**7.90**	--	--	1.00	U	--	**17.0**	--	--	--	--	--	**2.80**	--	--
YVD-05	YVD-05-160307	03/07/2016	N	59029521	**160**	J	FDP	**160**	J	FDP	--	--	--	0.100	UJ	RPD	**32.0**	--	--	**8.30**	--	--	1.00	U	--	**15.0**	--	--	--	--	--	**2.70**	--	--
YVD-05	YVD-D1-160307	03/07/2016	FD	59029521	**170**	J	FDP	**170**	J	FDP	--	--	--	0.100	UJ	RPD	**32.0**	--	--	**8.70**	--	--	**0.590**	--	--	**15.0**	--	--	--	--	--	**2.90**	--	--
YVD-05	YVD-05-160620	6/20/2016	N	59037151	**170**	--	--	**170**	--	--	--	--	--	0.100	U	--	**31.0**	--	--	**9.10**	--	--	1.00	U	--	**14.0**	--	--	--	--	--	**3.00**	--	--
YVD-05	YVD-05-160928	9/28/2016	N	K1611698	**171**	--	--	**171**	--	--	--	--	--	0.050	U	MBK	**32.1**	--	--	**8.37**	--	--	**0.440**	--	--	**13.8**	--	--	--	--	--	**3.12**	--	--
YVD-05	YVD-05-161215	12/15/2016	N	K1615174	**163**	--	--	**163**	--	--	--	--	--	0.050	U	--	**33.3**	--	--	**8.30**	--	--	**0.480**	--	--	**13.1**	--	--	--	--	--	**3.15**	--	--
YVD-05	YVD-031317-32	3/13/2017	N	K1702489	**166**	--	--	**166**	--	--	--	--	--	0.050	U	--	**31.4**	--	--	**7.89**	--	--	**0.490**	--	--	**14.1**	--	--	--	--	--	**2.88**	--	--
YVD-05	YVD-031317-34	3/13/2017	FD	K1702489	**168**	--	--	**168**	--	--	--	--	--	0.050	U	--	**31.4**	--	--	**7.92**	--	--	**0.480**	--	--	**14.0**	--	--	--	--	--	**2.91**	--	--
YVD-05	YVD-060617-23	6/6/2017	N	K1705754	**168**	--	--	**168**	--	--	--	--	--	0.050	U	--	**31.6**	--	--	**8.12**	--	--	**0.470**	--	--	**13.9**	--	--	--	--	--	**2.90**	--	--
YVD-05	YVD-092517-09	9/25/2017	N	K1710274	**173**	--	--	**173**	--	--	--	--	--	0.050	U	--	**35.3**	--	--	**8.01**	--	--	**0.470**	--	--	**14.6**	--	--	--	--	--	**2.82**	--	--
YVD-05	YVD-120517-15	12/5/2017	N	K1713091	**171**	--	--	**171**	--	--	--	--	--	0.050	U	MBK	**31.3**	--	--	**7.92**	--	--	**0.510**	--	--	**13.5**	--	--	--	--	--	**2.81**	--	--
YVD-05	YVD-060518-29	6/5/2018	N	874860	**170**	--	--	**170**	--	--	0.070	U	--	--	--	--	**31.6**	--	--	**8.29**	--	--	**0.440**	--	--	**14.2**	--	--	--	--	--	**2.79**	--	--
YVD-05	YVD-060219-09	6/2/2019	N	991939	**176**	--	--	**176**	--	--	0.070	U	--	--	--	--	**33.2**	--	--	6.43	U	FBK	0.310	U	FBK	**14.4**	--	--	--	--	--	**2.18**	--	--
YVD-05	YVD-060920-15	6/9/2020	N	009269	**182**	--	--	**182**	--	--	0.070	U	--	--	--	--	**35.4**	--	--	**9.24**	--	--	**0.390**	--	--	**15.4**	--	--	--	--	--	**3.88**	--	--
YVD-05	YVD-060821-26	6/8/2021	N	124212	**198**	--	--	**198**	--	--	0.070	U	--	--	--	--	**39.6**	--	--	**11.0**	--	--	**0.680**	--	--	**17.3**	--	--	--	--	--	**4.50**	--	--
YVD-05	YVD-060622-19	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**5.60**	--	--
YVD-05	YVD-062023-09	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**6.18**	J	HTQ
YVD-06	YVD-06-130917	09/17/2013	N	SWI0113	**149**	--	--	**150**	--	--	--	--	--	0.100	U	--	**46.0**	--	--	**3.13**	--	--	0.500	U	--	**12.8**	--	--	--	--	--	**0.510**	--	--
YVD-06	YVD-06-131209	12/09/2013	N	SWL0055	**154**	--	--	**155**	--	--	--	--	--	0.020	UJ	MSD	**31.2**	J	FDP	**2.73**	--	--	0.500	U	--	**5.27**	J	FDP	--	--	--	**0.490**	J	FDP

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			EPA 350.1			SM 4500 NH3--G			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-06	YVD-D1-131209	12/09/2013	FD	SWL0055	**159**	--	--	**160**	--	--	--	--	--	0.020	UJ	MSD	**38.9**	J	FDP	8.00	U	--	5.00	U	--	**6.55**	J	FDP	--	--	--	**6.400**	J	FDP
YVD-06	YVD-06-140316	03/16/2014	N	SXC0081	**174**	--	--	**175**	--	--	--	--	--	0.100	U	--	**40.1**	--	--	**3.47**	--	--	**0.580**	--	--	**7.59**	--	--	--	--	--	**0.610**	--	--
YVD-06	YVD-D1-140316	03/16/2014	FD	SXC0081	**159**	--	--	**160**	--	--	--	--	--	0.100	U	--	**40.5**	--	--	**3.16**	--	--	**0.550**	--	--	**7.78**	--	--	--	--	--	**0.620**	--	--
YVD-06	YVD-06-140601	06/01/2014	N	SXF0008	**156**	--	--	**158**	--	--	--	--	--	**0.172**	--	--	**37.8**	--	--	**2.88**	J	DUP	0.500	U	--	**6.50**	--	--	--	--	--	**0.510**	--	--
YVD-06	YVD-D1-140601	06/01/2014	FD	SXF0008	**153**	--	--	**155**	--	--	--	--	--	0.100	U	--	**38.3**	--	--	**2.95**	--	--	0.500	U	--	**6.56**	--	--	--	--	--	**0.560**	--	--
YVD-06	YVD-06-140921	09/21/2014	N	SXI0148	**149**	--	--	**150**	--	--	--	--	--	**0.139**	--	--	**41.3**	--	--	**2.45**	--	--	0.500	U	--	**8.52**	--	--	--	--	--	**0.440**	--	--
YVD-06	YVD-06-141215	12/15/2014	N	SXL0103	**149**	--	--	**150**	--	--	--	--	--	0.100	U	--	**40.3**	--	--	**2.50**	J+	MSD	0.500	U	--	**7.83**	--	--	--	--	--	**0.450**	J	DUP
YVD-06	YVD-06-150316	03/16/2015	N	5904471	**150**	--	--	**150**	--	--	--	--	--	0.100	U	--	**38.0**	--	--	**2.80**	--	--	0.500	U	--	**6.80**	--	--	--	--	--	**0.990**	--	--
YVD-06	YVD-06-150616	06/16/2015	N	59010751	**150**	--	--	**150**	--	--	--	--	--	0.100	U	--	**40.0**	J+	MSD	**2.70**	--	--	0.500	U	--	**7.00**	J+	MSD	--	--	--	**0.530**	--	--
YVD-06	YVD-06-150922	09/22/2015	N	59020141	**170**	--	--	**170**	--	--	--	--	--	**0.110**	--	--	**41.0**	--	--	**2.80**	--	--	0.500	U	--	**9.80**	--	--	--	--	--	**0.510**	--	--
YVD-06	YVD-06-151214	12/14/2015	N	59025351	**170**	--	--	**170**	--	--	--	--	--	--	R	MSD	**42.0**	--	--	**2.40**	--	--	0.500	U	--	**7.30**	--	--	--	--	--	**0.510**	--	--
YVD-06	YVD-06-160307	03/07/2016	N	59029521	**160**	J	FDP	**160**	J	FDP	--	--	--	0.100	UJ	RPD	**38.0**	--	--	**2.80**	--	--	0.500	U	--	**7.20**	--	--	--	--	--	**0.510**	--	--
YVD-06	YVD-06-160620	6/20/2016	N	59037151	**150**	--	--	**150**	--	--	--	--	--	0.100	U	--	**37.0**	--	--	**3.10**	--	--	0.500	U	--	**6.60**	--	--	--	--	--	**0.530**	--	--
YVD-06	YVD-06-160929	9/29/2016	N	K1611704	**145**	--	--	**145**	--	--	--	--	--	0.050	U	MBK	**35.7**	--	--	**2.64**	--	--	**0.200**	--	--	**6.12**	--	--	--	--	--	**0.550**	--	--
YVD-06	YVD-06-161215	12/15/2016	N	K1615126	**136**	--	--	**136**	--	--	--	--	--	0.050	U	--	**33.5**	--	--	**3.14**	--	--	**0.230**	--	--	**5.73**	--	--	--	--	--	**0.700**	--	--
YVD-06	YVD-030617-04	3/6/2017	N	K1702228	**142**	--	--	**142**	--	--	--	--	--	**0.021**	J	--	**35.2**	--	--	**2.83**	--	--	**0.290**	--	--	**5.84**	--	--	--	--	--	**0.610**	--	--
YVD-06	YVD-060617-21	6/6/2017	N	K1705754	**144**	--	--	**144**	--	--	--	--	--	0.050	U	--	**36.9**	--	--	**2.54**	--	--	**0.190**	J	--	**6.07**	--	--	--	--	--	**0.510**	--	--
YVD-06	YVD-092617-17	9/26/2017	N	K1710333	**140**	--	--	**140**	--	--	--	--	--	0.050	U	--	**35.0**	--	--	**2.94**	--	--	**0.230**	--	--	**5.82**	--	--	--	--	--	**0.620**	--	--
YVD-06	YVD-092617-18	9/26/2017	FD	K1710333	**140**	--	--	**140**	--	--	--	--	--	0.050	U	--	**34.6**	--	--	**2.95**	--	--	**0.220**	--	--	**5.77**	--	--	--	--	--	**0.620**	--	--
YVD-06	YVD-120517-17	12/5/2017	N	K1713091	**137**	--	--	**137**	--	--	--	--	--	0.050	U	MBK	**34.7**	--	--	**3.23**	--	--	**0.250**	--	--	**5.81**	--	--	--	--	--	**0.730**	--	--
YVD-06	YVD-060318-15	6/3/2018	N	874568	**138**	--	--	**138**	--	--	0.090	U	FBK	--	--	--	**37.5**	--	--	**2.69**	--	--	**0.180**	--	--	**6.45**	--	--	--	--	--	**0.560**	--	--
YVD-06	YVD-060219-11	6/2/2019	N	991939	**134**	--	--	**134**	--	--	0.070	U	--	--	--	--	**35.6**	--	--	2.50	U	FBK	0.150	U	FBK	**6.05**	--	--	--	--	--	**0.510**	--	--
YVD-06	YVD-060920-17	6/9/2020	N	009269	**132**	--	--	**132**	--	--	0.070	U	--	--	--	--	**34.2**	--	--	**3.20**	--	--	**0.170**	--	--	**5.90**	--	--	--	--	--	**0.700**	--	--
YVD-06	YVD-060721-19	6/7/2021	N	124105	**160**	--	--	**160**	--	--	0.070	U	--	--	--	--	**34.0**	--	--	**4.95**	--	--	**0.250**	--	--	**5.90**	--	--	--	--	--	**0.670**	--	--
YVD-06	YVD-062023-06	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**0.76**	J	HTQ
YVD-06	YVD-062023-07	6/20/2023	FD	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**0.75**	J	HTQ
YVD-07	YVD-07-130923	09/23/2013	N	SWI0178	**79.4**	--	--	**80.0**	--	--	--	--	--	0.100	U	--	**27.7**	--	--	--	--	--	--	--	--	**16.2**	--	--	--	--	--	--	--	--
YVD-07	YVD-07-130926	09/26/2013	N	SWI0190	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**7.53**	--	--	0.500	U	--	--	--	--	--	--	--	**4.40**	--	--
YVD-07	YVD-07-131210	12/10/2013	N	SWL0055	**135**	--	--	**135**	--	--	--	--	--	0.020	UJ	MSD	**99.2**	--	--	**8.46**	--	--	**0.550**	--	--	**16.0**	--	--	--	--	--	**5.30**	--	--
YVD-07	YVD-07-140316	03/16/2014	N	SXC0081	**134**	--	--	**135**	--	--	--	--	--	**0.116**	--	--	**33.4**	--	--	**11.6**	--	--	**0.830**	--	--	**14.1**	--	--	--	--	--	**3.90**	--	--
YVD-07	YVD-07-140604	06/04/2014	N	SXF0025	**137**	--	--	**138**	--	--	--	--	--	0.100	U	--	**38.4**	--	--	**9.74**	--	--	1.00	U	--	**18.3**	--	--	--	--	--	**3.36**	--	--
YVD-07	YVD-07-140922	09/22/2014	N	SXI0158	**134**	--	--	**135**	--	--	--	--	--	--	R	MSD	**31.4**	--	--	**10.3**	--	--	1.00	U	--	**12.7**	--	--	--	--	--	**5.52**	--	--
YVD-07	YVD-07-141216	12/16/2014	N	SXL0108	**133**	--	--	**135**	--	--	--	--	--	0.100	U	--	**29.9**	--	--	**8.76**	--	--	1.00	U	--	**12.2**	--	--	--	--	--	**2.92**	--	--
YVD-07	YVD-07-150316	03/16/2015	N	5904541	**140**	--	--	**140**	--	--	--	--	--	0.100	U	--	**37.0**	--	--	**15.0**	--	--	1.00	U	--	**15.0**	--	--	--	--	--	**4.00**	J-	MSD
YVD-07	YVD-D2-150316	03/16/2015	FD	5904541	**140**	--	--	**140**	--	--	--	--	--	0.100	U	--	**35.0**	--	--	**16.0**	--	--	**0.650**	--	--	**14.0**	--	--	--	--	--	**4.20**	J-	MSD
YVD-07	YVD-07-150616	06/16/2015	N	59010751	**150**	--	--	**150**	--	--	--	--	--	0.100	U	--	**34.0**	J+	MSD	**13.0**	--	--	0.500	U	--	**14.0**	J+	MSD	--	--	--	**3.30**	--	--
YVD-07	YVD-D1-150616	06/16/2015	FD	59010751	**140**	--	--	**140**	--	--	--	--	--	0.100	U	--	**35.0**	J+	MSD	**14.0**	--	--	0.500	U	--	**14.0**	J+	MSD	--	--	--	**3.50**	--	--
YVD-07	YVD-07-150923	09/23/2015	N	59020281	**160**	--	--	**160**	--	--	--	--	--	**0.220**	--	--	**33.0**	--	--	**9.90**	--	--	1.00	U	--	**14.0**	--	--	--	--	--	**4.70**	--	--
YVD-07	YVD-07-151214	12/14/2015	N	59025431	**140**	J	FDP	**140**	J	FDP	--	--	--	--	R	MSD	**30.0**	--	--	**6.70**	--	--	1.00	U	--	**13.0**	--	--	--	--	--	**2.40**	--	--
YVD-07	YVD-07-160308	03/08/2016	N	59029711	**140**	--	--	**140**	--	--	--	--	--	**1.10**	J+	FBK, FDP	**25.0**	--	--	**6.70**	--	--	1.00	U	--	**11.0**	--	--	--	--	--	**1.80**	--	--
YVD-07	YVD-07-160621	6/21/2016	N	59037151	**100.0**	--	--	**100.0**	--	--	--	--	--	0.100	U	--	**19.0**	--	--	**6.20**	--	--	1.00	U	--	**9.00**	--	--	--	--	--	**1.20**	--	--
YVD-07	YVD-07-160929	9/29/2016	N	K1611704	**113**	--	--	**113**	--	--	--	--	--	0.050	U	MBK	**17.8**	--	--	**5.30**	--	--	**0.400**	--	--	**7.14**	--	--	--	--	--	**1.37**	--	--
YVD-07	YVD-07-161213	12/13/2016	N	K1615083	**120**	--	--	**120**	--	--	--	--	--	0.050	U	--	**25.9**	--	--	**6.38**	--	--	**0.400**	--	--	**10.2**	--	--	--	--	--	**2.15**	--	--
YVD-07	YVD-030717-07	3/7/2017	N	K1702324	**107**	--	--	**107**	--	--	--	--	--	1.00	U	--	**17.6**	--	--	**5.34**	--	--	**0.430**	--	--	**6.47**	--	--	--	--	--	**1.74**	J	HTQ
YVD-07	YVD-060517-15	6/5/2017	N	K1705754	**105**	--	--	**105**	--	--	--	--	--	0.050	U	--	**19.4**	--	--	**6.07**	--	--	**0.390**	--	--	**7.31**	--	--	--	--	--	**2.07**	--	--
YVD-07	YVD-092617-21	9/26/2017	N	K1710333	**116**	--	--	**116**	--	--	--	--	--	0.050	U	--	**25.4**	--	--	**7.45**	--	--	**0.350**	--	--	**9.27**	--	--	--	--	--	**3.47**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			EPA 350.1			SM 4500 NH3--G			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-07	YVD-120417-11	12/4/2017	N	K1713026	**130**	--	--	**130**	--	--	--	--	--	0.050	U	--	**29.5**	--	--	**8.32**	--	--	**0.370**	--	--	**11.1**	--	--	--	--	--	**4.40**	--	--
YVD-07	YVD-060418-23	6/4/2018	N	874662	**126**	--	--	**126**	--	--	0.470	U	FBK	--	--	--	**34.0**	--	--	**10.5**	--	--	**0.300**	--	--	**13.4**	--	--	--	--	--	**3.34**	--	--
YVD-07	YVD-060319-16	6/3/2019	N	992053	**127**	--	--	**127**	--	--	0.070	U	--	--	--	--	**31.0**	--	--	**5.83**	--	--	**0.170**	--	--	**11.8**	--	--	--	--	--	**1.86**	--	--
YVD-07	YVD-060920-27	6/9/2020	N	009269	**145**	--	--	**145**	--	--	0.070	U	--	--	--	--	**33.8**	--	--	**8.90**	--	--	**0.290**	--	--	**13.7**	--	--	--	--	--	**4.86**	--	--
YVD-07	YVD-060821-34	6/8/2021	N	124212	**142**	--	--	**142**	--	--	0.070	U	--	--	--	--	**33.1**	--	--	**7.68**	--	--	**0.220**	--	--	**13.5**	--	--	--	--	--	**3.34**	--	--
YVD-07	YVD-060622-21	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**4.30**	--	--
YVD-07	YVD-060622-22	6/6/2022	FD	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**4.30**	--	--
YVD-07	YVD-062023-19	6/20/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**4.15**	J	HTQ
YVD-08	YVD-08-130919	09/19/2013	N	SWI0138	**354**	--	--	**355**	--	--	--	--	--	0.100	U	--	**126**	--	--	**145**	--	--	5.00	U	--	**43.8**	--	--	--	--	--	**8.00**	--	--
YVD-08	YVD-08-131211	12/11/2013	N	SWL0063	**259**	--	--	**260**	--	--	--	--	--	--	R	MSD	**134**	--	--	**123**	--	--	5.00	U	--	**53.8**	--	--	--	--	--	**22.5**	--	--
YVD-08	YVD-08-140317	03/17/2014	N	SXC0095	**294**	--	--	**295**	--	--	--	--	--	**0.146**	--	--	**122**	--	--	**128**	--	--	5.00	U	--	**42.0**	--	--	--	--	--	**14.3**	--	--
YVD-08	YVD-08-140602	06/02/2014	N	SXF0017	**279**	--	--	**280**	--	--	--	--	--	0.100	U	--	**138**	--	--	**118**	--	--	2.00	U	--	**64.6**	--	--	--	--	--	**14.7**	--	--
YVD-08	YVD-08-140923	09/23/2014	N	SXI0173	**249**	--	--	**250**	--	--	--	--	--	0.100	U	--	**103**	--	--	**122**	--	--	2.50	U	--	**36.3**	--	--	--	--	--	**8.10**	--	--
YVD-08	YVD-08-141216	12/16/2014	N	SXL0108	**264**	--	--	**265**	--	--	--	--	--	0.100	U	--	**111**	--	--	**126**	--	--	2.50	U	--	**41.4**	--	--	--	--	--	**14.0**	--	--
YVD-08	YVD-08-150317	03/17/2015	N	5904541	**230**	--	--	**230**	--	--	--	--	--	0.100	U	--	**110**	--	--	**120**	--	--	2.50	U	--	**40.0**	--	--	--	--	--	**13.0**	J-	MSD
YVD-08	YVD-D3-150317	03/17/2015	FD	5904541	**240**	--	--	**240**	--	--	--	--	--	0.100	U	--	**100**	--	--	**130**	--	--	0.500	U	--	**39.0**	--	--	--	--	--	**14.0**	J-	MSD
YVD-08	YVD-08-150617	06/17/2015	N	59010961	**280**	J	FDP	**280**	J	FDP	--	--	--	**0.140**	--	--	**110**	--	--	**120**	--	--	2.50	U	--	**40.0**	--	--	--	--	--	**19.0**	--	--
YVD-08	YVD-D3-150617	06/17/2015	FD	59010961	**220**	J	FDP	**220**	J	FDP	--	--	--	0.100	U	--	**110**	--	--	**140**	--	--	5.00	U	--	**39.0**	--	--	--	--	--	**19.0**	--	--
YVD-08	YVD-08-150924	09/24/2015	N	59020391	**260**	--	--	**260**	--	--	--	--	--	0.100	UJ	MSD	**110**	--	--	**120**	--	--	2.50	U	--	**44.0**	--	--	--	--	--	**20.0**	J+	MSD
YVD-08	YVD-08-151215	12/15/2015	N	59025501	**260**	--	--	**260**	--	--	--	--	--	--	R	MSD	**120**	--	--	**120**	--	--	2.50	U	--	**44.0**	--	--	--	--	--	**26.0**	--	--
YVD-08	YVD-D3-151215	12/15/2015	FD	59025501	**250**	--	--	**250**	--	--	--	--	--	**0.150**	J-	MSD	**120**	--	--	**110**	--	--	5.00	U	--	**46.0**	--	--	--	--	--	**26.0**	--	--
YVD-08	YVD-08-160310	03/10/2016	N	59029941	**240**	--	--	**240**	--	--	--	--	--	0.100	U	--	**120**	--	--	**120**	--	--	2.50	U	--	**44.0**	--	--	--	--	--	**32.0**	--	--
YVD-08	YVD-08-160622	6/22/2016	N	59037271	**230**	--	--	**230**	--	--	--	--	--	0.100	UJ	MSD	**120**	--	--	**110**	--	--	2.50	U	--	**46.0**	--	--	--	--	--	**34.0**	--	--
YVD-08	YVD-D3-160622	6/22/2016	FD	59037271	**230**	--	--	**230**	--	--	--	--	--	0.100	UJ	FBK, MSD	**120**	--	--	**120**	--	--	0.500	U	--	**46.0**	--	--	--	--	--	**34.0**	--	--
YVD-08	YVD-08-160927	9/27/2016	N	K1611565	**239**	--	--	**239**	--	--	--	--	--	0.050	U	MBK	**120**	--	--	**96.0**	--	--	**0.180**	J	--	**47.0**	--	--	--	--	--	**30.6**	--	--
YVD-08	YVD-08-161213	12/13/2016	N	K1615045	**222**	--	--	**222**	--	--	--	--	--	0.050	U	--	**122**	--	--	**89.3**	--	--	**0.230**	--	--	**41.9**	--	--	--	--	--	**34.5**	J	HTQ
YVD-08	YVD-030917-24	3/9/2017	N	K1702448	**263**	--	--	**263**	--	--	--	--	--	0.050	U	--	**136**	--	--	**95.2**	--	--	**0.200**	J	--	**44.4**	--	--	--	--	--	**37.3**	J	HTQ
YVD-08	YVD-060717-29	6/7/2017	N	K1705833	**236**	--	--	**236**	--	--	--	--	--	0.050	U	--	**139**	--	--	**94.3**	--	--	**0.170**	J	--	**48.3**	--	--	--	--	--	**44.0**	--	--
YVD-08	YVD-092617-19	9/26/2017	N	K1710333	**271**	--	--	**271**	--	--	--	--	--	0.050	U	--	**137**	--	--	**98.0**	--	--	**0.190**	J	--	**44.3**	--	--	--	--	--	**38.6**	J	HTQ
YVD-08	YVD-120517-23	12/5/2017	N	K1713157	**233**	--	--	**233**	--	--	--	--	--	0.050	U	--	**147**	--	--	**98.8**	--	--	**0.200**	J	--	**48.1**	--	--	--	--	--	**49.3**	--	--
YVD-08	YVD-031918-15	3/19/2018	N	870634	**250**	--	--	**250**	--	--	0.070	U	--	--	--	--	**134**	--	--	**103**	--	--	**0.150**	--	--	**46.0**	--	--	--	--	--	**46.3**	--	--
YVD-08	YVD-060518-31	6/5/2018	N	874860	**238**	--	--	**238**	--	--	0.070	U	--	--	--	--	**136**	--	--	**99.0**	--	--	**0.160**	--	--	**47.5**	--	--	--	--	--	**53.0**	--	--
YVD-08	YVD-090918-04	9/9/2018	N	880601	**237**	--	--	**237**	--	--	0.070	U	--	--	--	--	**146**	--	--	**103**	--	--	**0.180**	--	--	**49.2**	--	--	--	--	--	**54.4**	--	--
YVD-08	YVD-121118-19	12/11/2018	N	884939	**227**	--	--	**227**	--	--	0.070	U	--	--	--	--	**138**	--	--	**117**	--	--	**0.160**	--	--	**45.9**	--	--	--	--	--	**59.4**	--	--
YVD-08	YVD-031719-03	3/17/2019	N	988239	**234**	--	--	**234**	--	--	0.070	U	--	--	--	--	**138**	--	--	**119**	--	--	0.220	U	FBK	**46.3**	--	--	--	--	--	**54.8**	--	--
YVD-08	YVD-060319-21	6/3/2019	N	992053	**240**	--	--	**240**	--	--	0.070	U	--	--	--	--	**138**	--	--	**100**	--	--	**0.100**	--	--	**46.1**	--	--	--	--	--	**50.0**	--	--
YVD-08	YVD-090919-02	9/9/2019	N	998357	**226**	--	--	**226**	--	--	0.070	U	--	--	--	--	**139**	--	--	**89.8**	--	--	**0.150**	--	--	**45.7**	--	--	--	--	--	**62.0**	--	--
YVD-08	YVD-120919-02	12/9/2019	N	902276	**227**	--	--	**227**	--	--	0.070	U	--	--	--	--	**132**	--	--	**95.6**	--	--	**0.160**	--	--	**44.6**	--	--	--	--	--	**61.8**	--	--
YVD-08	YVD-120919-04	12/9/2019	FD	902276	**226**	--	--	**226**	--	--	0.070	U	--	--	--	--	**130**	--	--	**94.3**	--	--	**0.150**	--	--	**44.5**	--	--	--	--	--	**61.6**	--	--
YVD-08	YVD-033120-17	3/31/2020	N	006260	**213**	--	--	**213**	--	--	0.070	U	--	--	--	--	**132**	--	--	**96.5**	--	--	**0.180**	--	--	**45.7**	--	--	--	--	--	**68.0**	--	--
YVD-08	YVD-060920-23	6/9/2020	N	009269	**217**	--	--	**217**	--	--	0.070	U	--	--	--	--	**132**	--	--	**96.1**	--	--	**0.190**	--	--	**44.8**	--	--	--	--	--	**66.6**	--	--
YVD-08	YVD-092120-11	9/21/2020	N	013896	**216**	--	--	**216**	--	--	0.070	U	--	--	--	--	**134**	--	--	**96.2**	--	--	**0.160**	--	--	**45.8**	--	--	--	--	--	**66.0**	--	--
YVD-08	YVD-120720-11	12/7/2020	N	017035	**215**	--	--	**215**	--	--	0.070	U	--	--	--	--	**132**	--	--	**107**	--	--	**0.200**	--	--	**45.9**	--	--	--	--	--	**62.2**	--	--
YVD-08	YVD-030121-07	3/1/2021	N	119931	**217**	--	--	**217**	--	--	0.070	U	--	--	--	--	**135**	--	--	**92.9**	--	--	**0.200**	--	--	**45.8**	--	--	--	--	--	**68.8**	--	--
YVD-08	YVD-060821-28	6/8/2021	N	124212	**218**	--	--	**218**	--	--	0.070	U	--	--	--	--	**130**	--	--	**94.2**	--	--	**0.170**	--	--	**44.9**	--	--	--	--	--	**62.0**	--	--
YVD-08	YVD-121521-20	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**60.8**	J	HTQ, MS

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			EPA 350.1			SM 4500 NH3--G			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-08	YVD-031522-12	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**68.1**	--	--
YVD-08	YVD-060722-27	6/7/2022	N	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**69.1**	J	HTQ
YVD-08	YVD-091322-05	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**64.8**	--	--
YVD-08	YVD-122722-19	12/27/2022	N	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**71.5**	--	--
YVD-08	YVD-030623-13	3/6/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**47.8**	--	--	--	--	--
YVD-08	YVD-062123-28	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**54.3**	J	HTQ
YVD-08	YVD-091023-01	9/10/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**76.9**	J	HTQ
YVD-08	YVD-120423-03	12/4/2023	N	K2313548	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**52.0**	--	--
YVD-09	YVD-09-130919	09/19/2013	N	SWI0138	**369**	--	--	**370**	--	--	--	--	--	0.100	U	--	**107**	--	--	**96.3**	--	--	5.00	U	--	**39.3**	--	--	--	--	--	**74.7**	--	--
YVD-09	YVD-09-131212	12/12/2013	N	SWL0078	**384**	--	--	**385**	--	--	--	--	--	0.020	U	--	**109**	--	--	**87.2**	--	--	5.00	U	--	**42.0**	--	--	--	--	--	**64.4**	--	--
YVD-09	YVD-09-140319	03/19/2014	N	SXC0107	**388**	--	--	**390**	--	--	--	--	--	0.100	U	--	**109**	--	--	**104**	--	--	**5.50**		--	**40.8**	--	--	--	--	--	**62.4**	--	--
YVD-09	YVD-09-140603	06/03/2014	N	SXF0025	**367**	--	--	**368**	--	--	--	--	--	0.100	U	--	**113**	--	--	**89.8**	--	--	5.00	U	--	**44.5**	--	--	--	--	--	**57.1**	--	--
YVD-09	YVD-09-140924	09/24/2014	N	SXI0173	**359**	--	--	**360**	--	--	--	--	--	0.100	U	--	**118**	--	--	**68.2**	--	--	5.00	U	--	**41.7**	--	--	--	--	--	**48.0**	--	--
YVD-09	YVD-09-141217	12/17/2014	N	SXL0121	**359**	--	--	**360**	--	--	--	--	--	0.100	U	--	**130**	--	--	**85.0**	--	--	5.00	U	--	**56.3**	--	--	--	--	--	**53.9**	--	--
YVD-09	YVD-09-150318	03/18/2015	N	5904651	**350**	--	--	**350**	--	--	--	--	--	**0.140**	--	--	**110**	--	--	**74.0**	--	--	5.00	U	--	**46.0**	--	--	--	--	--	**47.0**	--	--
YVD-09	YVD-09-150617	06/17/2015	N	59010961	**350**	--	--	**350**	--	--	--	--	--	**0.140**	--	--	**110**	--	--	**89.0**	--	--	5.00	U	--	**43.0**	--	--	--	--	--	**54.0**	--	--
YVD-09	YVD-09-150923	09/23/2015	N	59020391	**330**	--	--	**330**	--	--	--	--	--	**0.210**	J	MSD	**110**	--	--	**78.0**	--	--	0.500	U	--	**46.0**	--	--	--	--	--	**56.0**	J+	MSD
YVD-09	YVD-09-151215	12/15/2015	N	59025501	**340**	--	--	**340**	--	--	--	--	--	--	R	MSD	**110**	--	--	**77.0**	--	--	5.00	U	--	**42.0**	--	--	--	--	--	**52.0**	--	--
YVD-09	YVD-09-160310	03/10/2016	N	59029941	**360**	--	--	**360**	--	--	--	--	--	**0.120**	--	--	**110**	--	--	**72.0**	--	--	5.00	U	--	**42.0**	--	--	--	--	--	**48.0**	--	--
YVD-09	YVD-09-160622	6/22/2016	N	59037271	**350**	--	--	**350**	--	--	--	--	--	0.100	UJ	MSD	**100**	--	--	**76.0**	--	--	5.00	U	--	**42.0**	--	--	--	--	--	**49.0**	--	--
YVD-09	YVD-09-160929	9/29/2016	N	K1611704	**347**	--	--	**347**	--	--	--	--	--	0.050	U	MBK	**103**	--	--	**66.7**	--	--	**0.340**	--	--	**41.2**	--	--	--	--	--	**43.2**	--	--
YVD-09	YVD-09-161213	12/13/2016	N	K1615045	**340**	--	--	**340**	--	--	--	--	--	0.050	U	--	**107**	--	--	**59.8**	--	--	**0.400**	--	--	**38.1**	--	--	--	--	--	**42.8**	J	HTQ
YVD-09	YVD-D2-161213	12/13/2016	FD	K1615045	**340**	--	--	**340**	--	--	--	--	--	0.050	U	--	**108**	--	--	**61.4**	--	--	**0.400**	--	--	**37.1**	--	--	--	--	--	**43.3**	J	HTQ
YVD-09	YVD-031317-35	3/13/2017	N	K1702489	**329**	--	--	**329**	--	--	--	--	--	0.050	U	--	**108**	--	--	**63.9**	--	--	**0.370**	--	--	**39.2**	--	--	--	--	--	**44.3**	--	--
YVD-09	YVD-060517-08	6/5/2017	N	K1705702	**341**	--	--	**341**	--	--	--	--	--	0.050	U	--	**110**	--	--	**62.6**	--	--	**0.390**	--	--	**39.4**	--	--	--	--	--	**44.6**	--	--
YVD-09	YVD-092617-29	9/26/2017	N	K1710381	**351**	--	--	**351**	--	--	--	--	--	0.050	U	--	**109**	--	--	**61.0**	--	--	**0.380**	--	--	**37.2**	--	--	--	--	--	**44.1**	J	HTQ
YVD-09	YVD-092617-30	9/26/2017	FD	K1710381	**415**	--	--	**415**	--	--	--	--	--	0.050	U	--	**109**	--	--	**61.1**	--	--	**0.380**	--	--	**37.4**	--	--	--	--	--	**44.1**	J	HTQ
YVD-09	YVD-120517-21	12/5/2017	N	K1713091	**351**	--	--	**351**	--	--	--	--	--	0.050	U	--	**108**	--	--	**63.0**	--	--	**0.380**	--	--	**35.9**	--	--	--	--	--	**46.9**	--	--
YVD-09	YVD-031918-18	3/19/2018	N	870634	**350**	--	--	**350**	--	--	0.070	U	--	--	--	--	**108**	--	--	**69.2**	--	--	**0.340**	--	--	**35.9**	--	--	--	--	--	**48.5**	--	--
YVD-09	YVD-060318-13	6/3/2018	N	874568	**348**	--	--	**348**	--	--	0.070	U	--	--	--	--	**107**	--	--	**63.4**	--	--	**0.360**	--	--	**37.8**	--	--	--	--	--	**50.6**	--	--
YVD-09	YVD-090918-06	9/9/2018	N	880601	**354**	--	--	**354**	--	--	0.070	U	--	--	--	--	**108**	--	--	**71.0**	--	--	**0.350**	--	--	**35.9**	--	--	--	--	--	**51.4**	--	--
YVD-09	YVD-121118-15	12/11/2018	N	884939	**358**	--	--	**358**	--	--	0.070	U	--	--	--	--	**102**	--	--	**65.6**	--	--	**0.340**	--	--	**34.3**	--	--	--	--	--	**52.8**	--	--
YVD-09	YVD-121118-17	12/11/2018	FD	884939	**357**	--	--	**357**	--	--	0.070	U	--	--	--	--	**103**	--	--	**68.0**	--	--	**0.330**	--	--	**34.6**	--	--	--	--	--	**54.6**	--	--
YVD-09	YVD-031719-05	3/17/2019	N	988239	**356**	--	--	**356**	--	--	0.070	U	--	--	--	--	**104**	--	--	**67.4**	--	--	0.310	U	FBK	**35.8**	--	--	--	--	--	**56.0**	--	--
YVD-09	YVD-060319-15	6/3/2019	N	992053	**353**	--	--	**353**	--	--	0.070	U	--	--	--	--	**104**	--	--	**43.4**	--	--	**0.360**	--	--	**35.7**	--	--	--	--	--	**53.3**	--	--
YVD-09	YVD-090919-04	9/9/2019	N	998357	**363**	--	--	**363**	--	--	0.070	U	--	--	--	--	**110**	--	--	**64.7**	--	--	**0.330**	--	--	**36.5**	--	--	--	--	--	**58.2**	--	--
YVD-09	YVD-120919-06	12/9/2019	N	902276	**356**	--	--	**356**	--	--	0.070	U	--	--	--	--	**106**	--	--	**69.1**	--	--	**0.370**	--	--	**35.8**	--	--	--	--	--	**57.0**	--	--
YVD-09	YVD-033020-05	3/30/2020	N	006241	**350**	--	--	**350**	--	--	0.070	U	--	--	--	--	**102**	--	--	**71.4**	--	--	**0.370**	--	--	**35.2**	--	--	--	--	--	**55.2**	--	--
YVD-09	YVD-060920-24	6/9/2020	N	009269	**350**	--	--	**350**	--	--	0.070	U	--	--	--	--	**102**	--	--	**68.8**	--	--	**0.310**	--	--	**35.4**	--	--	--	--	--	**55.2**	--	--
YVD-09	YVD-092120-16	9/21/2020	N	013896	**347**	--	--	**347**	--	--	0.070	U	--	--	--	--	**101**	--	--	**72.5**	--	--	0.100	U	--	**35.1**	--	--	--	--	--	**56.2**	--	--
YVD-09	YVD-120720-13	12/7/2020	N	017035	**345**	--	--	**345**	--	--	0.070	U	--	--	--	--	**101**	--	--	**69.4**	--	--	**0.260**	--	--	**35.7**	--	--	--	--	--	**54.0**	--	--
YVD-09	YVD-030121-05	3/1/2021	N	119931	**347**	--	--	**347**	--	--	0.070	U	--	--	--	--	**104**	--	--	**68.8**	--	--	**0.350**	--	--	**36.3**	--	--	--	--	--	**57.4**	--	--
YVD-09	YVD-060721-18	6/7/2021	N	124105	**352**	--	--	**352**	--	--	0.070	U	--	--	--	--	**102**	--	--	**75.9**	--	--	**0.320**	--	--	**35.5**	--	--	--	--	--	**54.4**	--	--
YVD-09	YVD-121421-09	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**55.3**	J	HTQ, MS
YVD-09	YVD-031522-14	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**60.8**	--	--
YVD-09	YVD-060622-12	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**60.7**	--	--
YVD-09	YVD-091322-07	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**59.8**	--	--
YVD-09	YVD-120822-15	12/8/2022	N	K2214578	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**61.8**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			EPA 350.1			SM 4500 NH3--G			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-09	YVD-030623-19	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-09	YVD-062123-30	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**63.6**	J	HTQ
YVD-09	YVD-091123-07	9/11/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**65.7**	--	--
YVD-09	YVD-091123-09	9/11/2023	FD	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**65.6**	--	--
YVD-09	YVD-120423-13	12/4/2023	N	K2313657	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**66.9**	J	HTQ
YVD-10	YVD-10-130917	09/17/2013	N	SWI0123	**464**	--	--	**465**	--	--	--	--	--	0.100	U	--	**216**	--	--	**95.4**	--	--	5.00	U	--	**51.8**	--	--	--	--	--	**95.0**		--
YVD-10	YVD-10-131212	12/12/2013	N	SWL0078	**459**	--	--	**460**	--	--	--	--	--	0.020	U	--	**202**	--	--	**91.4**	--	--	5.00	U	--	**55.6**	--	--	--	--	--	**86.9**	--	--
YVD-10	YVD-10-140319	03/19/2014	N	SXC0107	**489**	--	--	**490**	--	--	--	--	--	**0.109**	--	--	**218**	--	--	**86.8**	--	--	5.00	U	--	**54.0**	--	--	--	--	--	**77.6**	--	--
YVD-10	YVD-10-140603	06/03/2014	N	SXF0025	**487**	--	--	**488**	--	--	--	--	--	**0.105**	--	--	**232**	--	--	**94.3**	--	--	5.00	U	--	**58.6**	--	--	--	--	--	**86.1**	--	--
YVD-10	YVD-10-140924	09/24/2014	N	SXI0173	**523**	--	--	**525**	--	--	--	--	--	0.100	U	--	**276**	--	--	**115**	--	--	5.00	U	--	**65.8**	--	--	--	--	--	**97.2**	--	--
YVD-10	YVD-10-141217	12/17/2014	N	SXL0144	**503**	--	--	**505**	--	--	--	--	--	0.500	U	--	**248**	--	--	**97.9**	--	--	5.00	U	--	**60.4**	--	--	--	--	--	**78.7**	--	--
YVD-10	YVD-10-150318	03/18/2015	N	5904651	**590**	--	--	**590**	--	--	--	--	--	0.100	U	--	**400**	--	--	**180**	--	--	5.00	U	--	**92.0**	--	--	--	--	--	**120**	--	--
YVD-10	YVD-10-150617	06/17/2015	N	59010961	**600**	--	--	**600**	--	--	--	--	--	**0.120**	--	--	**390**	--	--	**39.0**	--	--	5.00	U	--	**95.0**	--	--	--	--	--	**20.0**	--	--
YVD-10	YVD-10-150923	09/23/2015	N	59020391	**620**	--	--	**620**	--	--	--	--	--	**0.720**	J	MSD	**330**	--	--	**160**	--	--	5.00	U	--	**89.0**	--	--	--	--	--	**120**	J+	MSD
YVD-10	YVD-10-151214	12/14/2015	N	59025351	**600**	--	--	**600**	--	--	--	--	--	--	R	MSD	**350**	--	--	**150**	--	--	5.00	U	--	**84.0**	--	--	--	--	--	**120**	--	--
YVD-10	YVD-10-160309	03/09/2016	N	59029711	**520**	--	--	**520**	--	--	--	--	--	0.100	UJ	FDP	**310**	--	--	**140**	--	--	5.00	U	--	**73.0**	--	--	--	--	--	**98.0**	--	--
YVD-10	YVD-10-160621	6/21/2016	N	59037271	**510**	--	--	**510**	--	--	--	--	--	**0.110**	J-	MSD	**270**	--	--	**120**	--	--	5.00	U	--	**73.0**	--	--	--	--	--	**96.0**	--	--
YVD-10	YVD-10-160929	9/29/2016	N	K1611698	**513**	--	--	**513**	--	--	--	--	--	0.050	U	MBK	**286**	--	--	**105**	--	--	0.200	U	MBK	**63.1**	--	--	--	--	--	**84.0**	--	--
YVD-10	YVD-10-161212	12/12/2016	N	K1615029	**524**	--	--	**524**	--	--	--	--	--	0.050	U	--	**303**	--	--	**141**	--	--	**0.100**	J	--	**66.9**	--	--	--	--	--	**109**	J	HTQ
YVD-10	YVD-030917-27	3/9/2017	N	K1702448	**637**	--	--	**637**	--	--	--	--	--	0.050	U	--	**569**	--	--	**173**	--	--	**0.090**	J	--	**128**	--	--	--	--	--	**123**	J	HTQ
YVD-10	YVD-060617-22	6/6/2017	N	K1705754	**525**	--	--	**525**	--	--	--	--	--	0.050	U	--	**349**	--	--	**125**	--	--	**0.140**	J	--	**76.7**	--	--	--	--	--	**99.4**	--	--
YVD-10	YVD-092617-31	9/26/2017	N	K1710381	**523**	--	--	**523**	--	--	--	--	--	0.050	U	--	**316**	--	--	**113**	--	--	**0.090**	J	--	**66.7**	--	--	--	--	--	**93.9**	J	HTQ
YVD-10	YVD-120517-30	12/5/2017	N	K1713091	**540**	--	--	**540**	--	--	--	--	--	0.050	U	--	**327**	--	--	**128**	--	--	**0.110**	J	--	**67.3**	--	--	--	--	--	**109**	J	HTQ
YVD-10	YVD-031818-06	3/18/2018	N	870610	**527**	--	--	**527**	--	--	0.070	U	--	--	--	--	**296**	--	--	**121**	--	--	0.100	U	--	**61.0**	--	--	--	--	--	**91.4**	--	--
YVD-10	YVD-060318-06	6/3/2018	N	874568	**543**	--	--	**543**	--	--	0.080	U	FBK	--	--	--	**298**	--	--	**122**	--	--	0.100	U	--	**65.0**	--	--	--	--	--	**92.0**	--	--
YVD-10	YVD-090918-13	9/9/2018	N	880601	**557**	--	--	**557**	--	--	0.070	U	--	--	--	--	**308**	--	--	**128**	--	--	**0.100**	--	--	**63.5**	--	--	--	--	--	**90.0**	--	--
YVD-10	YVD-121018-08	12/10/2018	N	884857	**544**	--	--	**544**	--	--	0.070	U	--	--	--	--	**274**	--	--	**124**	--	--	0.100	U	FBK	**58.0**	J	MSD	--	--	--	**87.0**	--	--
YVD-10	YVD-031819-16	3/18/2019	N	988273	**527**	--	--	**527**	--	--	0.070	U	--	--	--	--	**276**	--	--	**141**	--	--	**0.100**	--	--	**58.0**	--	--	--	--	--	**81.6**	--	--
YVD-10	YVD-060319-18	6/3/2019	N	992053	**568**	--	--	**568**	--	--	0.070	U	--	--	--	--	**297**	--	--	**135**	--	--	0.100	U	--	**63.0**	--	--	--	--	--	**74.4**	--	--
YVD-10	YVD-091019-20	9/10/2019	N	998438	**584**	--	--	**584**	--	--	0.070	U	--	--	--	--	**256**	--	--	**92.0**	--	--	0.100	U	--	**54.5**	--	--	--	--	--	**69.0**	--	--
YVD-10	YVD-121019-21	12/10/2019	N	902321	**576**	--	--	**576**	--	--	0.070	U	--	--	--	--	**286**	--	--	**114**	--	--	0.100	U	--	**59.5**	--	--	--	--	--	**84.4**	--	--
YVD-10	YVD-033020-08	3/30/2020	N	006241	**568**	--	--	**568**	--	--	0.070	U	--	--	--	--	**264**	--	--	**104**	--	--	0.100	U	--	**57.0**	--	--	--	--	--	**73.2**	--	--
YVD-10	YVD-060920-12	6/9/2020	N	009269	**586**	--	--	**586**	--	--	0.070	U	--	--	--	--	**293**	--	--	**128**	--	--	0.100	U	--	**62.0**	--	--	--	--	--	**82.6**	--	--
YVD-10	YVD-092020-08	9/20/2020	N	013864	**596**	--	--	**596**	--	--	0.070	U	--	--	--	--	**306**	--	--	**110**	--	--	0.100	U	--	**63.5**	--	--	--	--	--	**76.0**	--	--
YVD-10	YVD-120720-12	12/7/2020	N	017035	**612**	--	--	**612**	--	--	0.070	U	--	--	--	--	**331**	--	--	**161**	--	--	0.100	U	--	**71.0**	--	--	--	--	--	**76.0**	--	--
YVD-10	YVD-030121-12	3/1/2021	N	119931	**770**	--	--	**770**	--	--	0.070	U	--	--	--	--	**482**	--	--	**90.0**	--	--	0.100	U	--	**97.0**	--	--	--	--	--	**44.4**	--	--
YVD-10	YVD-060621-07	6/6/2021	N	124053	**710**	--	--	**710**	--	--	0.070	U	--	--	--	--	**320**	--	--	**85.3**	--	--	**0.490**	--	--	**68.0**	--	--	--	--	--	**53.1**	--	--
YVD-10	YVD-121421-06	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**75.8**	--	--
YVD-10	YVD-031422-06	3/14/2022	N	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**17.7**	--	--
YVD-10	YVD-060522-06	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**55.3**	--	--
YVD-10	YVD-091422-20	9/14/2022	N	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**55.9**	--	--
YVD-10	YVD-120722-11	12/7/2022	N	K2214479	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**68.8**	--	--
YVD-10	YVD-030623-10	3/6/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-10	YVD-062123-26	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**66.1**	J	HTQ
YVD-10	YVD-091023-03	9/10/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**70.3**	J	HTQ
YVD-10	YVD-091023-05	9/10/2023	FD	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**70.4**	J	HTQ
YVD-10	YVD-120623-05	12/6/2023	N	K2313796	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**64.3**	J	HTQ
YVD-11	YVD-11-130923	09/23/2013	N	SWI0178	**254**	J	FDP	**255**	J	FDP	--	--	--	0.100	U	--	**183**	--	--	--	--	--	--	--	--	**51.9**	--	--	--	--	--	--	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			EPA 350.1			SM 4500 NH3--G			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-11	YVD-D2-130923	09/23/2013	FD	SWI0178	**199**	J	FDP	**200**	J	FDP	--	--	--	0.100	U	--	**175**	--	--	--	--	--	--	--	--	**46.0**	--	--	--	--	--	--	--	--
YVD-11	YVD-11-130926	09/26/2013	N	SWI0190	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**54.7**	--	--	5.00	U	--	--	--	--	--	--	--	**38.4**	--	--
YVD-11	YVD-D3-130926	09/26/2013	FD	SWI0190	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**61.4**	--	--	5.00	U	--	--	--	--	--	--	--	**46.2**	--	--
YVD-11	YVD-11-131212	12/12/2013	N	SWL0073	**294**	--	--	**295**	--	--	--	--	--	0.020	UJ	MSD	**171**	--	--	**58.7**	--	--	5.00	U	--	**43.4**	--	--	--	--	--	**49.9**	--	--
YVD-11	YVD-11-140318	03/18/2014	N	SXC0107	**324**	--	--	**325**	--	--	--	--	--	0.100	U	--	**183**	--	--	**61.6**	--	--	5.00	U	--	**44.4**	--	--	--	--	--	**43.7**	--	--
YVD-11	YVD-11-140603	06/03/2014	N	SXF0017	**312**	--	--	**313**	--	--	--	--	--	0.100	U	--	**176**	--	--	**67.2**	--	--	5.00	U	--	**50.3**	--	--	--	--	--	**49.1**	--	--
YVD-11	YVD-11-140924	09/24/2014	N	SXI0173	**294**	--	--	**295**	--	--	--	--	--	0.100	U	--	**193**	--	--	**67.2**	--	--	2.50	U	--	**47.9**	--	--	--	--	--	**46.6**	--	--
YVD-11	YVD-11-141217	12/17/2014	N	SXL0121	**289**	--	--	**290**	--	--	--	--	--	0.100	U	--	**198**	--	--	**72.1**	--	--	5.00	U	--	**53.6**	--	--	--	--	--	**49.1**	--	--
YVD-11	YVD-11-150317	03/17/2015	N	5904651	**290**	--	--	**290**	--	--	--	--	--	0.100	U	--	**190**	--	--	**76.0**	--	--	5.00	U	--	**51.0**	--	--	--	--	--	**52.0**	--	--
YVD-11	YVD-11-150616	06/16/2015	N	59010961	**290**	--	--	**290**	--	--	--	--	--	0.100	U	--	**200**	--	--	**86.0**	--	--	5.00	U	--	**50.0**	--	--	--	--	--	**56.0**	--	--
YVD-11	YVD-11-150923	09/23/2015	N	59020281	**310**	--	--	**310**	--	--	--	--	--	**0.120**	--	--	**200**	--	--	**90.0**	--	--	5.00	U	--	**55.0**	--	--	--	--	--	**66.0**	--	--
YVD-11	YVD-11-151215	12/15/2015	N	59025431	**110**	J	FDP	**110**	J	FDP	--	--	--	--	R	MSD	**210**	--	--	**100**	--	--	5.00	U	--	**60.0**	--	--	--	--	--	**74.0**	--	--
YVD-11	YVD-D2-151215	12/15/2015	FD	59025431	**360**	J	FDP	**360**	J	FDP	--	--	--	--	R	MSD	**210**	--	--	**98.0**	--	--	0.500	U	--	**58.0**	--	--	--	--	--	**70.0**	--	--
YVD-11	YVD-11-160309	03/09/2016	N	59029711	**340**	--	--	**340**	--	--	--	--	--	**0.140**	J	FDP	**200**	--	--	**99.0**	--	--	5.00	U	--	**53.0**	--	--	--	--	--	**65.0**	--	--
YVD-11	YVD-11-160621	6/21/2016	N	59037151	**340**	--	--	**340**	--	--	--	--	--	0.100	U	--	**200**	--	--	**120**	--	--	5.00	U	--	**56.0**	--	--	--	--	--	**71.0**	--	--
YVD-11	YVD-11-160927	9/27/2016	N	K1611629	**375**	--	--	**375**	--	--	--	--	--	0.050	U	MBK	**204**	--	--	**82.0**	--	--	**0.180**	J	--	**52.6**	--	--	--	--	--	**48.9**	J	HTQ
YVD-11	YVD-11-161214	12/14/2016	N	K1615126	**352**	--	--	**352**	--	--	--	--	--	0.050	U	--	**209**	--	--	**82.5**	--	--	**0.190**	J	--	**57.8**	--	--	--	--	--	**55.5**	--	--
YVD-11	YVD-031317-37	3/13/2017	N	K1702489	**353**	--	--	**353**	--	--	--	--	--	0.050	U	--	**235**	--	--	**102**	--	--	**0.210**	--	--	**62.1**	--	--	--	--	--	**77.3**	--	--
YVD-11	YVD-060517-10	6/5/2017	N	K1705702	**341**	--	--	**341**	--	--	--	--	--	0.050	U	--	**271**	--	--	**129**	--	--	**0.180**	J	--	**69.1**	--	--	--	--	--	**97.1**	--	--
YVD-11	YVD-092617-26	9/26/2017	N	K1710381	**347**	--	--	**347**	--	--	--	--	--	0.050	U	--	**276**	--	--	**135**	--	--	**0.170**	J	--	**68.6**	--	--	--	--	--	**103**	J	HTQ
YVD-11	YVD-120417-06	12/4/2017	N	K1713026	**361**	--	--	**361**	--	--	--	--	--	0.050	U	--	**248**	--	--	**110**	--	--	**0.160**	J	--	**58.6**	--	--	--	--	--	**84.8**	--	--
YVD-11	YVD-031918-12	3/19/2018	N	870634	**386**	--	--	**386**	--	--	0.070	U	--	--	--	--	**223**	--	--	**91.4**	--	--	**0.110**	--	--	**51.5**	--	--	--	--	--	**61.8**	--	--
YVD-11	YVD-031918-14	3/19/2018	FD	870634	**387**	--	--	**387**	--	--	0.070	U	--	--	--	--	**222**	--	--	**89.1**	--	--	**0.120**	--	--	**50.5**	--	--	--	--	--	**61.2**	--	--
YVD-11	YVD-060418-14	6/4/2018	N	874662	**377**	--	--	**377**	--	--	0.340	U	FBK	--	--	--	**224**	--	--	**114**	--	--	**0.120**	--	--	**57.0**	--	--	--	--	--	**68.6**	--	--
YVD-11	YVD-060418-16	6/4/2018	FD	874662	**380**	--	--	**380**	--	--	0.080	U	FBK	--	--	--	**231**	--	--	**114**	--	--	**0.120**	--	--	**57.5**	--	--	--	--	--	**68.2**	--	--
YVD-11	YVD-090918-05	9/9/2018	N	880601	**395**	--	--	**395**	--	--	0.070	U	--	--	--	--	**223**	--	--	**102**	--	--	**0.200**	--	--	**53.0**	--	--	--	--	--	**62.8**	--	--
YVD-11	YVD-121018-10	12/10/2018	N	884857	**410**	--	--	**410**	--	--	0.070	U	--	--	--	--	**182**	--	--	**75.6**	--	--	0.140	U	FBK	**44.9**	J	MSD	--	--	--	**41.1**	--	--
YVD-11	YVD-031819-18	3/18/2019	N	988273	**440**	--	--	**440**	--	--	0.070	U	--	--	--	--	**158**	--	--	**38.6**	--	--	**0.120**	--	--	**38.9**	--	--	--	--	--	**20.2**	--	--
YVD-11	YVD-060219-02	6/2/2019	N	991939	**424**	--	--	**424**	--	--	0.070	U	--	--	--	--	**156**	--	--	49.2	U	FBK	0.590	U	FBK	**38.3**	--	--	--	--	--	**26.4**	--	--
YVD-11	YVD-060219-04	6/2/2019	FD	991939	**423**	--	--	**423**	--	--	0.070	U	--	--	--	--	**156**	--	--	49.8	U	FBK	0.600	U	FBK	**38.7**	--	--	--	--	--	**26.7**	--	--
YVD-11	YVD-090919-05	9/9/2019	N	998357	**423**	--	--	**423**	--	--	0.070	U	--	--	--	--	**164**	--	--	**52.2**	--	--	**0.120**	--	--	**40.0**	--	--	--	--	--	**32.8**	--	--
YVD-11	YVD-120919-13	12/9/2019	N	902276	**429**	--	--	**429**	--	--	0.070	U	--	--	--	--	**162**	--	--	**46.1**	--	--	**0.110**	--	--	**39.7**	--	--	--	--	--	**27.8**	--	--
YVD-11	YVD-033020-10	3/30/2020	N	006241	**426**	--	--	**426**	--	--	0.070	U	--	--	--	--	**150**	--	--	**39.6**	--	--	**0.130**	--	--	**36.6**	--	--	--	--	--	**23.8**	--	--
YVD-11	YVD-061020-31	6/10/2020	N	009361	**420**	--	--	**420**	--	--	0.070	U	--	--	--	--	**151**	--	--	**47.0**	--	--	**0.130**	--	--	**36.6**	J	MS	--	--	--	**24.9**	--	--
YVD-11	YVD-092120-20	9/21/2020	N	013896	**413**	--	--	**413**	--	--	0.070	U	--	--	--	--	**162**	--	--	**69.2**	--	--	**0.120**	--	--	**40.9**	--	--	--	--	--	**37.5**	--	--
YVD-11	YVD-120720-10	12/7/2020	N	017035	**412**	--	--	**412**	--	--	0.070	U	--	--	--	--	**179**	--	--	**78.2**	--	--	**0.240**	--	--	**44.4**	--	--	--	--	--	**48.0**	--	--
YVD-11	YVD-030121-06	3/1/2021	N	119931	**422**	--	--	**422**	--	--	0.070	U	--	--	--	--	**178**	--	--	**85.9**	--	--	**0.170**	--	--	**45.6**	--	--	--	--	--	**44.1**	--	--
YVD-11	YVD-060821-23	6/8/2021	N	124212	**414**	--	--	**414**	--	--	0.070	U	--	--	--	--	**170**	--	--	**85.4**	--	--	**0.110**	--	--	**41.9**	--	--	--	--	--	**41.7**	--	--
YVD-11	YVD-121421-05	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**46.1**	--	--
YVD-11	YVD-031522-19	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**44.6**	--	--
YVD-11	YVD-060622-18	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**82.7**	--	--
YVD-11	YVD-091422-21	9/14/2022	N	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**57.1**	--	--
YVD-11	YVD-120622-06	12/6/2022	N	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**62.5**	--	--
YVD-11	YVD-030623-21	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**58.7**	--	--	--	--	--
YVD-11	YVD-062123-24	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**80.8**	J	HTQ
YVD-11	YVD-091123-11	9/11/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**104**	--	--
YVD-11	YVD-120723-01	12/7/2023	N	K2313796	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**72.4**	--	--
YVD-12	YVD-12-130919	09/19/2013	N	SWI0142	**204**	--	--	**205**	--	--	--	--	--	0.100	U	--	**98.6**	--	--	**98.2**	--	--	5.00	U	--	**37.5**	--	--	--	--	--	--	--	--
YVD-12	YVD-12-130925	09/25/2013	N	SWI0175	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**15.0**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			EPA 350.1			SM 4500 NH3--G			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-12	YVD-12-131211	12/11/2013	N	SWL0073	**194**	--	--	**195**	--	--	--	--	--	0.020	UJ	MSD	**93.5**	--	--	**97.0**	--	--	5.00	U	--	**36.2**	--	--	--	--	--	**20.1**	--	--
YVD-12	YVD-12-140318	03/18/2014	N	SXC0095	**204**	--	--	**205**	--	--	--	--	--	**0.248**	--	--	**92.9**	--	--	**95.2**	--	--	5.00	U	--	**35.9**	--	--	--	--	--	**17.0**	--	--
YVD-12	YVD-12-140603	06/03/2014	N	SXF0017	**199**	--	--	**200**	--	--	--	--	--	0.100	U	--	**92.6**	--	--	**8.33**	--	--	0.500	U	--	**34.9**	--	--	--	--	--	**1.44**	--	--
YVD-12	YVD-12-140922	09/22/2014	N	SXI0148	**189**	--	--	**190**	--	--	--	--	--	0.100	U	--	**98.4**	--	--	**78.5**	--	--	5.00	U	--	**39.1**	--	--	--	--	--	**13.3**	--	--
YVD-12	YVD-D2-140922	09/22/2014	FD	SXI0148	**194**	--	--	**195**	--	--	--	--	--	0.100	U	--	**99.3**	--	--	**82.4**	--	--	2.00	U	--	**39.0**	--	--	--	--	--	**15.5**	--	--
YVD-12	YVD-12-141216	12/16/2014	N	SXL0121	**194**	--	--	**195**	--	--	--	--	--	0.100	U	--	**99.3**	--	--	**84.1**	--	--	5.00	U	--	**39.6**	--	--	--	--	--	**15.1**	--	--
YVD-12	YVD-12-150317	03/17/2015	N	5904541	**190**	--	--	**190**	--	--	--	--	--	0.100	U	--	**93.0**	--	--	**75.0**	--	--	5.00	U	--	**37.0**	--	--	--	--	--	**14.0**	J-	MSD
YVD-12	YVD-12-150617	06/17/2015	N	59010961	**190**	--	--	**190**	--	--	--	--	--	0.100	U	--	**90.0**	--	--	**84.0**	--	--	5.00	U	--	**35.0**	--	--	--	--	--	**12.0**	--	--
YVD-12	YVD-12-150924	09/24/2015	N	59020391	**190**	--	--	**190**	--	--	--	--	--	0.100	UJ	MSD	**92.0**	--	--	**78.0**	--	--	5.00	U	--	**39.0**	--	--	--	--	--	**15.0**	J+	MSD
YVD-12	YVD-12-151216	12/16/2015	N	59025501	**210**	--	--	**210**	--	--	--	--	--	--	R	MSD	**95.0**	--	--	**76.0**	--	--	5.00	U	--	**37.0**	--	--	--	--	--	**14.0**	--	--
YVD-12	YVD-12-160309	03/09/2016	N	59029941	**210**	--	--	**210**	--	--	--	--	--	0.100	U	--	**95.0**	--	--	**73.0**	--	--	5.00	U	--	**35.0**	--	--	--	--	--	**13.0**	--	--
YVD-12	YVD-D3-160309	03/09/2016	FD	59029941	**200**	--	--	**200**	--	--	--	--	--	0.100	U	--	**95.0**	--	--	**79.0**	--	--	0.500	U	--	**36.0**	--	--	--	--	--	**15.0**	--	--
YVD-12	YVD-12-160622	6/22/2016	N	59037271	**190**	--	--	**190**	--	--	--	--	--	0.100	UJ	MSD	**89.0**	--	--	**90.0**	--	--	5.00	U	--	**36.0**	--	--	--	--	--	**14.0**	--	--
YVD-12	YVD-12-160929	9/29/2016	N	K1611704	**188**	--	--	**188**	--	--	--	--	--	0.050	U	MBK	**88.9**	--	--	**83.5**	--	--	**0.330**	--	--	**37.2**	--	--	--	--	--	**13.5**	--	--
YVD-12	YVD-12-161213	12/13/2016	N	K1615083	**183**	--	--	**183**	--	--	--	--	--	0.050	U	--	**93.4**	--	--	**81.7**	--	--	**0.330**	--	--	**33.6**	--	--	--	--	--	**12.2**	--	--
YVD-12	YVD-030917-20	3/9/2017	N	K1702404	**132**	--	--	**132**	--	--	--	--	--	0.050	U	--	**97.3**	--	--	**91.7**	--	--	**0.380**	--	--	**35.4**	--	--	--	--	--	**13.4**	--	--
YVD-12	YVD-060617-25	6/6/2017	N	K1705833	**183**	--	--	**183**	--	--	--	--	--	0.050	U	--	**98.4**	--	--	**94.1**	--	--	**0.320**	--	--	**35.8**	--	--	--	--	--	**13.6**	--	--
YVD-12	YVD-092517-15	9/25/2017	N	K1710333	**188**	--	--	**188**	--	--	--	--	--	0.050	U	--	**97.6**	--	--	**94.7**	--	--	**0.340**	--	--	**34.2**	--	--	--	--	--	**14.0**	--	--
YVD-12	YVD-120417-03	12/4/2017	N	K1713026	**186**	--	--	**186**	--	--	--	--	--	0.050	U	--	**89.7**	--	--	**85.4**	--	--	**0.410**	--	--	**32.9**	--	--	--	--	--	**13.4**	--	--
YVD-12	YVD-031918-13	3/19/2018	N	870610	**181**	--	--	**181**	--	--	0.070	U	--	--	--	--	**98.0**	--	--	**97.7**	--	--	**0.350**	--	--	**35.3**	--	--	--	--	--	**13.6**	--	--
YVD-12	YVD-060318-11	6/3/2018	N	874568	**178**	--	--	**178**	--	--	0.070	U	FBK	--	--	--	**103**	--	--	**100**	--	--	**0.340**	--	--	**38.4**	--	--	--	--	--	**15.1**	--	--
YVD-12	YVD-090918-16	9/9/2018	N	880601	**185**	--	--	**185**	--	--	0.070	U	--	--	--	--	**110**	--	--	**105**	--	--	**0.330**	--	--	**38.7**	--	--	--	--	--	**15.8**	--	--
YVD-12	YVD-121018-13	12/10/2018	N	884857	**184**	--	--	**184**	--	--	0.070	U	--	--	--	--	**106**	--	--	**98.9**	--	--	0.290	U	FBK	**37.7**	J	MSD	--	--	--	**15.5**	--	--
YVD-12	YVD-031719-07	3/17/2019	N	988239	**189**	--	--	**189**	--	--	0.070	U	--	--	--	--	**104**	--	--	**97.6**	--	--	0.310	U	FBK	**38.0**	--	--	--	--	--	**18.4**	--	--
YVD-12	YVD-060319-27	6/3/2019	N	992053	**185**	--	--	**185**	--	--	0.070	U	--	--	--	--	**104**	--	--	**96.7**	--	--	**0.240**	--	--	**38.1**	--	--	--	--	--	**18.9**	--	--
YVD-12	YVD-090919-16	9/9/2019	N	998357	**185**	--	--	**185**	--	--	0.070	U	--	--	--	--	**106**	--	--	**95.6**	--	--	**0.290**	--	--	**37.5**	--	--	--	--	--	**16.5**	--	--
YVD-12	YVD-120919-12	12/9/2019	N	902276	**190**	--	--	**190**	--	--	**0.300**	--	--	--	--	--	**104**	--	--	**97.8**	--	--	**0.320**	--	--	**38.8**	--	--	--	--	--	**19.6**	--	--
YVD-12	YVD-033020-11	3/30/2020	N	006241	**183**	--	--	**183**	--	--	0.070	U	--	--	--	--	**99.5**	--	--	**99.5**	--	--	**0.320**	--	--	**36.3**	--	--	--	--	--	**17.1**	--	--
YVD-12	YVD-060920-22	6/9/2020	N	009269	**186**	--	--	**186**	--	--	0.070	U	--	--	--	--	**110**	--	--	**101**	--	--	**0.290**	--	--	**38.7**	--	--	--	--	--	**19.5**	--	--
YVD-12	YVD-092120-18	9/21/2020	N	013896	**180**	--	--	**180**	--	--	0.070	U	--	--	--	--	**96.5**	--	--	**99.3**	--	--	**0.270**	--	--	**35.5**	--	--	--	--	--	**13.8**	--	--
YVD-12	YVD-120820-19	12/8/2020	N	017137	**184**	--	--	**184**	--	--	0.070	U	--	--	--	--	**101**	--	--	**114**	--	--	**0.280**	--	--	**36.9**	--	--	--	--	--	**15.2**	--	--
YVD-12	YVD-030221-19	3/2/2021	N	120034	**184**	--	--	**184**	--	--	0.070	U	--	--	--	--	**101**	--	--	**98.1**	--	--	**0.300**	--	--	**36.6**	--	--	--	--	--	**14.8**	--	--
YVD-12	YVD-060821-25	6/8/2021	N	124212	**180**	--	--	**180**	--	--	0.070	U	--	--	--	--	**102**	--	--	**100**	--	--	**0.250**	--	--	**37.0**	--	--	--	--	--	**14.4**	--	--
YVD-12	YVD-121521-18	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**13.4**	J	HTQ, MS
YVD-12	YVD-031522-21	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**14.6**	--	--
YVD-12	YVD-060622-20	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**19.5**	--	--
YVD-12	YVD-091322-09	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**13.8**	--	--
YVD-12	YVD-120822-16	12/8/2022	N	K2214578	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**14.7**	--	--
YVD-12	YVD-030523-02	3/5/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**15.5**	--	--	--	--	--
YVD-12	YVD-062123-31	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**20.5**	J	HTQ
YVD-12	YVD-091123-19	9/11/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**15.7**	--	--
YVD-12	YVD-120323-01	12/3/2023	N	K2313548	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**16.0**	J	HTQ
YVD-13	YVD-13-130919	09/19/2013	N	SWI0138	**134**	--	--	**135**	--	--	--	--	--	0.100	U	--	**102**	--	--	**90.3**	--	--	5.00	U	--	**29.9**	--	--	--	--	--	**27.6**	--	--
YVD-13	YVD-13-131211	12/11/2013	N	SWL0073	**139**	--	--	**140**	--	--	--	--	--	0.020	UJ	MSD	**101**	--	--	**77.8**	--	--	5.00	U	--	**29.4**	--	--	--	--	--	**21.7**	--	--
YVD-13	YVD-13-140318	03/18/2014	N	SXC0095	**134**	--	--	**135**	--	--	--	--	--	**0.288**		--	**102**	--	--	**80.3**	--	--	5.00	U	--	**29.3**	--	--	--	--	--	**24.2**	--	--
YVD-13	YVD-13-140603	06/03/2014	N	SXF0017	**129**	--	--	**130**	--	--	--	--	--	**0.103**		--	**94.8**	--	--	**39.7**	--	--	2.00	U	--	**27.7**	--	--	--	--	--	**12.4**	--	--
YVD-13	YVD-13-140923	09/23/2014	N	SXI0173	**124**	--	--	**125**	--	--	--	--	--	0.100	U	--	**104**	--	--	**81.7**	--	--	5.00	U	--	**29.0**	--	--	--	--	--	**26.7**	--	--
YVD-13	YVD-13-141217	12/17/2014	N	SXL0121	**124**	--	--	**125**	--	--	--	--	--	0.100	U	--	**114**	--	--	**86.5**	--	--	5.00	U	--	**33.1**	--	--	--	--	--	**27.3**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			EPA 350.1			SM 4500 NH3--G			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-13	YVD-13-150317	03/17/2015	N	5904541	**130**	--	--	**130**	--	--	--	--	--	0.100	U	--	**100**	--	--	**72.0**	--	--	5.00	U	--	**30.0**	--	--	--	--	--	**24.0**	J-	MSD
YVD-13	YVD-13-150617	06/17/2015	N	59010961	**140**	--	--	**140**	--	--	--	--	--	0.100	U	--	**110**	--	--	**81.0**	--	--	5.00	U	--	**30.0**	--	--	--	--	--	**27.0**	--	--
YVD-13	YVD-13-150924	09/24/2015	N	59020391	**150**	--	--	**150**	--	--	--	--	--	0.100	UJ	MSD	**98.0**	--	--	**70.0**	--	--	5.00	U	--	**31.0**	--	--	--	--	--	**26.0**	J+	MSD
YVD-13	YVD-13-151216	12/16/2015	N	59025501	**140**	--	--	**140**	--	--	--	--	--	--	R	MSD	**100**	--	--	**69.0**	--	--	5.00	U	--	**30.0**	--	--	--	--	--	**26.0**	--	--
YVD-13	YVD-13-160309	03/09/2016	N	59029941	**140**	--	--	**140**	--	--	--	--	--	0.100	U	--	**100**	--	--	**85.0**	--	--	5.00	U	--	**29.0**	--	--	--	--	--	**32.0**	--	--
YVD-13	YVD-13-160622	6/22/2016	N	59037271	**130**	--	--	**130**	--	--	--	--	--	0.100	UJ	MSD	**100**	--	--	**76.0**	--	--	5.00	U	--	**30.0**	--	--	--	--	--	**28.0**	--	--
YVD-13	YVD-13-160928	9/28/2016	N	K1611698	**133**	--	--	**133**	--	--	--	--	--	0.050	U	MBK	**101**	--	--	**60.0**	--	--	**0.300**	--	--	**28.1**	--	--	--	--	--	**23.5**	J	HTQ
YVD-13	YVD-13-161214	12/13/2016	N	K1615083	**132**	--	--	**132**	--	--	--	--	--	0.050	U	--	**100**	--	--	**57.3**	--	--	**0.330**	--	--	**27.5**	--	--	--	--	--	**23.1**	--	--
YVD-13	YVD-030717-08	3/7/2017	N	K1702324	**138**	--	--	**138**	--	--	--	--	--	1.00	U	--	**96.9**	--	--	**52.8**	--	--	**0.350**	--	--	**26.7**	--	--	--	--	--	**23.3**	J	HTQ
YVD-13	YVD-030717-10	3/7/2017	FD	K1702324	**139**	--	--	**139**	--	--	--	--	--	1.00	U	--	**97.3**	--	--	**53.6**	--	--	**0.370**	--	--	**27.1**	--	--	--	--	--	**23.7**	J	HTQ
YVD-13	YVD-060717-33	6/7/2017	N	K1705833	**134**	--	--	**134**	--	--	--	--	--	0.050	U	--	**99.0**	--	--	**54.6**	--	--	**0.300**	--	--	**27.9**	--	--	--	--	--	**22.7**	--	--
YVD-13	YVD-092617-25	9/26/2017	N	K1710333	**142**	--	--	**142**	--	--	--	--	--	0.050	U	--	**94.9**	--	--	**52.8**	--	--	**0.330**	--	--	**24.5**	--	--	--	--	--	**23.2**	--	--
YVD-13	YVD-120417-07	12/4/2017	N	K1713026	**141**	--	--	**141**	--	--	--	--	--	0.050	U	--	**93.4**	--	--	**53.9**	--	--	**0.360**	--	--	**24.5**	--	--	--	--	--	**24.3**	--	--
YVD-13	YVD-031918-19	3/19/2018	N	870634	**138**	--	--	**138**	--	--	0.070	U	--	--	--	--	**96.0**	--	--	**63.0**	--	--	**0.340**	--	--	**25.5**	--	--	--	--	--	**25.8**	--	--
YVD-13	YVD-060318-09	6/3/2018	N	874568	**137**	--	--	**137**	--	--	0.070	U	--	--	--	--	**91.0**	--	--	**63.3**	--	--	**0.350**	--	--	**25.9**	--	--	--	--	--	**25.2**	--	--
YVD-13	YVD-090918-14	9/9/2018	N	880601	**140**	--	--	**140**	--	--	0.070	U	--	--	--	--	**92.0**	--	--	**66.6**	--	--	**0.340**	--	--	**24.6**	--	--	--	--	--	**26.1**	--	--
YVD-13	YVD-121018-11	12/10/2018	N	884857	**142**	--	--	**142**	--	--	0.070	U	--	--	--	--	**87.5**	--	--	**70.8**	--	--	0.250	U	FBK	**24.2**	J	MSD	--	--	--	**28.6**	--	--
YVD-13	YVD-031819-15	3/18/2019	N	988273	**153**	--	--	**153**	--	--	0.070	U	--	--	--	--	**91.0**	--	--	**74.4**	--	--	**0.310**	--	--	**24.5**	--	--	--	--	--	**29.1**	--	--
YVD-13	YVD-060319-25	6/3/2019	N	992053	**142**	--	--	**142**	--	--	0.070	U	--	--	--	--	**90.0**	--	--	**40.9**	--	--	**0.230**	--	--	**24.4**	--	--	--	--	--	**28.0**	--	--
YVD-13	YVD-090919-10	9/9/2019	N	998357	**143**	--	--	**143**	--	--	0.070	U	--	--	--	--	**90.0**	--	--	**67.6**	--	--	**0.380**	--	--	**24.0**	--	--	--	--	--	**31.0**	--	--
YVD-13	YVD-120919-10	12/9/2019	N	902276	**138**	--	--	**138**	--	--	0.070	U	--	--	--	--	**88.0**	--	--	**73.4**	--	--	**0.370**	--	--	**24.1**	--	--	--	--	--	**30.9**	--	--
YVD-13	YVD-033020-09	3/30/2020	N	006241	**140**	--	--	**140**	--	--	0.070	U	--	--	--	--	**87.5**	--	--	**77.0**	--	--	**0.340**	--	--	**24.1**	--	--	--	--	--	**30.9**	--	--
YVD-13	YVD-060920-21	6/9/2020	N	009269	**139**	--	--	**139**	--	--	0.070	U	--	--	--	--	**89.5**	--	--	**71.1**	--	--	**0.290**	--	--	**24.6**	--	--	--	--	--	**28.5**	--	--
YVD-13	YVD-092120-13	9/21/2020	N	013896	**138**	--	--	**138**	--	--	0.070	U	--	--	--	--	**92.0**	--	--	**79.7**	--	--	**0.300**	--	--	**25.1**	--	--	--	--	--	**32.3**	--	--
YVD-13	YVD-120820-17	12/8/2020	N	017137	**137**	--	--	**137**	--	--	0.070	U	--	--	--	--	**90.5**	--	--	**64.8**	--	--	**0.330**	--	--	**25.1**	--	--	--	--	--	**27.1**	--	--
YVD-13	YVD-030221-15	3/2/2021	N	120034	**144**	--	--	**144**	--	--	0.070	U	--	--	--	--	**93.5**	--	--	**83.0**	--	--	**0.340**	--	--	**25.5**	--	--	--	--	--	**34.3**	--	--
YVD-13	YVD-060821-32	6/8/2021	N	124212	**142**	--	--	**142**	--	--	0.070	U	--	--	--	--	**92.5**	--	--	**82.8**	--	--	**0.310**	--	--	**25.5**	--	--	--	--	--	**34.0**	--	--
YVD-13	YVD-121521-16	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**34.0**	J	HTQ, MS
YVD-13	YVD-031522-20	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**35.7**	--	--
YVD-13	YVD-060722-24	6/7/2022	N	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**36.2**	J	HTQ
YVD-13	YVD-091322-11	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**35.5**	--	--
YVD-13	YVD-122722-18	12/27/2022	N	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**36.0**	--	--
YVD-13	YVD-030623-08	3/6/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**37.3**	--	--	--	--	--
YVD-13	YVD-030623-09	3/6/2023	FD	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**37.0**	--	--	--	--	--
YVD-13	YVD-062023-14	6/20/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**35.0**	J	HTQ
YVD-13	YVD-091123-21	9/11/2023	N	K2310209	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**36.1**	J	HTQ
YVD-13	YVD-120423-09	12/4/2023	N	K2313657	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**38.0**	J	HTQ
YVD-14	YVD-14-130918	09/18/2013	N	SWI0123	**605**	--	--	**605**	--	--	--	--	--	0.100	U	--	**260**	--	--	**118**	--	--	5.00	U	--	**65.4**	--	--	--	--	--	**112**	--	--
YVD-14	YVD-14-131212	12/12/2013	N	SWL0078	**544**	--	--	**545**	--	--	--	--	--	0.020	U	--	**249**	--	--	**104**	--	--	5.00	U	--	**65.6**	--	--	--	--	--	**105**	--	--
YVD-14	YVD-14-140319	03/19/2014	N	SXC0107	**634**	--	--	**635**	--	--	--	--	--	0.100	U	--	**248**	--	--	**108**	--	--	5.00	U	--	**64.5**	--	--	--	--	--	**101**	--	--
YVD-14	YVD-14-140604	06/04/2014	N	SXF0025	**569**	--	--	**570**	--	--	--	--	--	0.100	U	--	**240**	--	--	**109**	--	--	5.00	U	--	**63.2**	--	--	--	--	--	**102**	--	--
YVD-14	YVD-14-140924	09/24/2014	N	SXI0173	**554**	--	--	**555**	--	--	--	--	--	**0.107**	--	--	**268**	--	--	**110**	--	--	5.00	U	--	**72.0**	--	--	--	--	--	**96.7**	--	--
YVD-14	YVD-14-141217	12/17/2014	N	SXL0121	**539**	--	--	**540**	--	--	--	--	--	0.100	U	--	**252**	--	--	**110**	--	--	5.00	U	--	**70.9**	--	--	--	--	--	**96.1**	--	--
YVD-14	YVD-14-150318	03/18/2015	N	5904651	**530**	--	--	**530**	--	--	--	--	--	**0.110**	--	--	**260**	--	--	**110**	--	--	5.00	U	--	**70.0**	--	--	--	--	--	**91.0**	--	--
YVD-14R	YVD-14R-151216	12/16/2015	N	59025501	**550**	--	--	**550**	--	--	--	--	--	--	R	MSD	**250**	--	--	**110**	--	--	5.00	U	--	**69.0**	--	--	--	--	--	**98.0**	--	--
YVD-14R	YVD-14R-160309	03/09/2016	N	59029941	**600**	--	--	**600**	--	--	--	--	--	0.100	U	--	**250**	--	--	**110**	--	--	5.00	U	--	**67.0**	--	--	--	--	--	**100**	--	--
YVD-14R	YVD-14R-160622	6/22/2016	N	59037271	**490**	--	--	**490**	--	--	--	--	--	0.100	UJ	MSD	**230**	--	--	**110**	--	--	5.00	U	--	**67.0**	--	--	--	--	--	**110**	--	--
YVD-14R	YVD-14R-160928	9/28/2016	N	K1611698	**535**	--	--	**535**	--	--	--	--	--	0.050	U	MBK	**252**	--	--	**95.7**	--	--	**0.160**	J	--	**65.9**	--	--	--	--	--	**92.1**	J	HTQ

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			EPA 350.1			SM 4500 NH3--G			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-14R	YVD-14R-161212	12/12/2016	N	K1615029	**578**	--	--	**578**	--	--	--	--	--	0.050	U	--	**251**	--	--	**94.7**	--	--	**0.240**	--	--	**65.7**	--	--	--	--	--	**92.3**	J	HTQ
YVD-14R	YVD-D1-161212	12/12/2016	FD	K1615029	**571**	--	--	**571**	--	--	--	--	--	0.050	U	--	**255**	--	--	**93.3**	--	--	**0.190**	--	--	**66.5**	--	--	--	--	--	**92.3**	J	HTQ
YVD-14R	YVD-030917-19	3/9/2017	N	K1702404	**526**	--	--	**526**	--	--	--	--	--	0.050	U	--	**257**	--	--	**97.0**	--	--	**0.180**	J	--	**66.1**	--	--	--	--	--	**91.1**	--	--
YVD-14R	YVD-030917-21	3/9/2017	FD	K1702404	**514**	--	--	**514**	--	--	--	--	--	0.050	U	--	**251**	--	--	**95.0**	--	--	**0.190**	J	--	**65.2**	--	--	--	--	--	**92.2**	J	HTQ
YVD-14R	YVD-060517-06	6/5/2017	N	K1705702	**505**	--	--	**505**	--	--	--	--	--	0.050	U	--	**243**	--	--	**98.4**	--	--	**0.200**	--	--	**62.3**	--	--	--	--	--	**95.7**	--	--
YVD-14R	YVD-092517-14	9/25/2017	N	K1710333	**515**	--	--	**515**	--	--	--	--	--	0.050	U	--	**238**	--	--	**99.8**	--	--	**0.180**	J	--	**61.2**	--	--	--	--	--	**97.3**	--	--
YVD-14R	YVD-120417-12	12/4/2017	N	K1713026	**504**	--	--	**504**	--	--	--	--	--	0.050	U	--	**230**	--	--	**98.3**	--	--	**0.220**	--	--	**59.3**	--	--	--	--	--	**96.7**	--	--
YVD-14R	YVD-031818-11	3/18/2018	N	870610	**514**	--	--	**514**	--	--	**0.170**	--	--	--	--	--	**232**	--	--	**102**	--	--	**0.130**	--	--	**60.0**	--	--	--	--	--	**90.2**	--	--
YVD-14R	YVD-060318-04	6/3/2018	N	874568	**521**	--	--	**521**	--	--	0.190	U	FBK	--	--	--	**233**	--	--	**105**	--	--	**0.150**	--	--	**63.0**	--	--	--	--	--	**96.5**	--	--
YVD-14R	YVD-090918-09	9/9/2018	N	880601	**532**	--	--	**532**	--	--	0.070	U	--	--	--	--	**250**	--	--	**115**	--	--	**0.180**	--	--	**63.5**	--	--	--	--	--	**115**	--	--
YVD-14R	YVD-121018-02	12/10/2018	N	884857	**528**	--	--	**528**	--	--	0.070	U	--	--	--	--	**256**	--	--	**133**	--	--	0.150	U	FBK	**66.0**	J	MSD	--	--	--	**117**	--	--
YVD-14R	YVD-121018-04	12/10/2018	FD	884857	**528**	--	--	**528**	--	--	0.070	U	--	--	--	--	**254**	--	--	**132**	--	--	0.150	U	FBK	**66.0**	J	MSD	--	--	--	**115**	--	--
YVD-14R	YVD-031819-12	3/18/2019	N	988273	**531**	--	--	**531**	--	--	0.070	U	--	--	--	--	**277**	--	--	**151**	--	--	**0.440**	J	DUP	**71.5**	--	--	--	--	--	**138**	--	--
YVD-14R	YVD-031819-14	3/18/2019	FD	988273	**532**	--	--	**532**	--	--	0.070	U	--	--	--	--	**275**	--	--	**148**	--	--	**0.130**	J	DUP	**70.5**	--	--	--	--	--	**135**	--	--
YVD-14R	YVD-060319-22	6/3/2019	N	992053	**542**	--	--	**542**	--	--	**0.120**	U	--	--	--	--	**284**	--	--	**149**	--	--	**0.220**	--	--	**73.5**	--	--	--	--	--	**136**	--	--
YVD-14R	YVD-060319-24	6/3/2019	FD	992053	**538**	--	--	**538**	--	--	0.070	U	--	--	--	--	**270**	--	--	**130**	--	--	0.100	U	--	**71.5**	--	--	--	--	--	**138**	--	--
YVD-14R	YVD-090919-13	9/9/2019	N	998357	**560**	--	--	**560**	--	--	0.070	U	--	--	--	--	**280**	--	--	**130**	--	--	**0.130**	--	--	**73.0**	--	--	--	--	--	**140**	--	--
YVD-14R	YVD-121019-15	12/10/2019	N	902321	**533**	--	--	**533**	--	--	0.070	U	--	--	--	--	**255**	--	--	**128**	--	--	**0.130**	--	--	**66.5**	--	--	--	--	--	**126**	--	--
YVD-14R	YVD-121019-17	12/10/2019	FD	902321	**543**	--	--	**543**	--	--	0.070	U	--	--	--	--	**256**	--	--	**128**	--	--	**0.130**	--	--	**66.5**	--	--	--	--	--	**125**	--	--
YVD-14R	YVD-033020-02	3/30/2020	N	006241	**555**	--	--	**555**	--	--	0.070	U	--	--	--	--	**262**	--	--	**134**	--	--	**0.130**	--	--	**68.0**	--	--	--	--	--	**126**	--	--
YVD-14R	YVD-033020-04	3/30/2020	FD	006241	**556**	--	--	**556**	--	--	0.070	U	--	--	--	--	**262**	--	--	**132**	--	--	**0.130**	--	--	**68.0**	--	--	--	--	--	**127**	--	--
YVD-14R	YVD-060920-20	6/9/2020	N	009269	**569**	--	--	**569**	--	--	0.070	U	--	--	--	--	**269**	--	--	**149**	--	--	**0.110**	--	--	**70.5**	--	--	--	--	--	**130**	--	--
YVD-14R	YVD-092120-14	9/21/2020	N	013896	**560**	--	--	**560**	--	--	0.070	U	--	--	--	--	**260**	--	--	**141**	--	--	**0.210**	--	--	**68.5**	--	--	--	--	--	**122**	--	--
YVD-14R	YVD-120820-20	12/8/2020	N	017137	**556**	--	--	**556**	--	--	0.070	U	--	--	--	--	**263**	--	--	**148**	--	--	**0.120**	--	--	**68.0**	--	--	--	--	--	**119**	--	--
YVD-14R	YVD-030121-08	3/1/2021	N	119931	**564**	--	--	**564**	--	--	0.070	U	--	--	--	--	**266**	--	--	**139**	--	--	**0.140**	--	--	**70.5**	--	--	--	--	--	**129**	--	--
YVD-14R	YVD-060621-09	6/6/2021	N	124053	**558**	--	--	**558**	--	--	0.070	U	--	--	--	--	**262**	--	--	**131**	--	--	**0.140**	--	--	**68.0**	--	--	--	--	--	**121**	--	--
YVD-14R	YVD-121421-08	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**118**	J	HTQ, MS
YVD-14R	YVD-031422-07	3/14/2022	N	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**134**	--	--
YVD-14R	YVD-060522-09	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**125**	--	--
YVD-14R	YVD-091422-15	9/14/2022	N	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**121**	--	--
YVD-14R	YVD-120822-13	12/8/2022	N	K2214578	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**119**	--	--
YVD-14R	YVD-120822-14	12/8/2022	FD	K2214578	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**118**	--	--
YVD-14R	YVD-030523-03	3/5/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**125**	--	--	--	--	--
YVD-14R	YVD-062123-29	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**117**	J	HTQ
YVD-14R	YVD-091123-12	9/11/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**114**	--	--
YVD-14R	YVD-120423-15	12/4/2023	N	K2313657	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**111**	J	HTQ
YVD-15	YVD-15-130917	09/17/2013	N	SWI0123	**514**	--	--	**515**	--	--	--	--	--	0.100	U	--	**125**	--	--	**62.8**	--	--	5.00	U	--	**51.6**	--	--	--	--	--	**72.5**	--	--
YVD-15	YVD-15-131212	12/12/2013	N	SWL0078	**494**	--	--	**495**	--	--	--	--	--	0.020	U	--	**131**	--	--	**120**	--	--	5.00	U	--	**59.4**	--	--	--	--	--	**71.2**	--	--
YVD-15	YVD-15-140319	03/19/2014	N	SXC0107	**534**	--	--	**535**	--	--	--	--	--	**0.112**	--	--	**124**	--	--	**54.9**	--	--	5.00	U	--	**57.9**	--	--	--	--	--	**47.4**	--	--
YVD-15	YVD-15-140603	06/03/2014	N	SXF0025	**509**	--	--	**510**	--	--	--	--	--	0.100	U	--	**138**	--	--	**82.5**	--	--	5.00	U	--	**64.7**	--	--	--	--	--	**88.1**	--	--
YVD-15	YVD-15-140924	09/24/2014	N	SXI0173	**541**	--	--	**545**	--	--	--	--	--	**0.246**	--	--	**132**	--	--	**58.7**	--	--	5.00	U	--	**56.9**	--	--	--	--	--	**54.8**	--	--
YVD-15	YVD-15-141217	12/17/2014	N	SXL0121	**518**	--	--	**520**	--	--	--	--	--	0.100	U	--	**175**	--	--	**57.6**	--	--	5.00	U	--	**81.6**	--	--	--	--	--	**66.9**	--	--
YVD-15	YVD-15-150317	03/17/2015	N	5904651	**550**	--	--	**550**	--	--	--	--	--	0.100	U	--	**280**	--	--	**65.0**	--	--	5.00	U	--	**130**	--	--	--	--	--	**67.0**	--	--
YVD-15	YVD-15-150617	06/17/2015	N	59011021	**550**	--	--	**550**	--	--	--	--	--	0.100	U	--	**140**	--	--	**42.0**	--	--	0.500	U	--	**66.0**	J	RPD	--	--	--	**39.0**	J-	MSD, HTQ
YVD-15	YVD-15-150925	09/25/2015	N	59020431	**480**	--	--	**480**	--	--	--	--	--	0.100	U	--	**98.0**	--	--	**22.0**	--	--	5.00	U	--	**46.0**	--	--	--	--	--	**14.0**	--	--
YVD-15	YVD-15-151215	12/15/2015	N	59025431	**540**	J	FDP	**540**	J	FDP	--	--	--	--	R	MSD	**120**	--	--	**37.0**	--	--	5.00	U	--	**59.0**	--	--	--	--	--	**38.0**	--	--
YVD-15	YVD-15-160309	03/09/2016	N	59029711	**520**	--	--	**520**	--	--	--	--	--	0.100	UJ	FDP	**120**	--	--	**32.0**	--	--	5.00	U	--	**60.0**	--	--	--	--	--	**36.0**	--	--
YVD-15	YVD-15-160621	6/21/2016	N	59037271	**430**	--	--	**430**	--	--	--	--	--	**0.130**	J-	MSD	**110**	--	--	**26.0**	--	--	5.00	U	--	**56.0**	--	--	--	--	--	**31.0**	--	--
YVD-15	YVD-15-160928	9/28/2016	N	K1611629	**401**	--	--	**401**	--	--	--	--	--	0.050	U	MBK	**112**	--	--	**22.5**	--	--	**0.290**	--	--	**50.9**	--	--	--	--	--	**26.6**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			EPA 350.1			SM 4500 NH3--G			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-15	YVD-15-161215	12/15/2016	N	K1615126	**395**	--	--	**395**	--	--	--	--	--	0.050	U	--	**113**	--	--	**22.1**	--	--	**0.320**	--	--	**50.4**	--	--	--	--	--	**25.5**	--	--
YVD-15	YVD-030917-23	3/9/2017	N	K1702404	**395**	--	--	**395**	--	--	--	--	--	0.050	U	--	**119**	--	--	**23.0**	--	--	**0.340**	--	--	**52.9**	--	--	--	--	--	**25.0**	J	HTQ
YVD-15	YVD-060617-20	6/6/2017	N	K1705754	**399**	--	--	**399**	--	--	--	--	--	0.050	U	--	**126**	--	--	**21.8**	--	--	**0.320**	--	--	**54.6**	--	--	--	--	--	**23.0**	--	--
YVD-15	YVD-092517-10	9/25/2017	N	K1710333	**412**	--	--	**412**	--	--	--	--	--	0.050	U	--	**112**	--	--	**22.1**	--	--	**0.350**	--	--	**50.2**	--	--	--	--	--	**21.8**	--	--
YVD-15	YVD-120517-28	12/5/2017	N	K1713091	**414**	--	--	**414**	--	--	--	--	--	0.050	U	--	**112**	--	--	**21.8**	--	--	**0.340**	--	--	**48.0**	--	--	--	--	--	**22.7**	J	HTQ
YVD-15	YVD-031818-09	3/18/2018	N	870610	**397**	--	--	**397**	--	--	0.070	U	--	--	--	--	**104**	--	--	**21.7**	--	--	**0.320**	--	--	**46.6**	--	--	--	--	--	**24.4**	--	--
YVD-15	YVD-060318-08	6/3/2018	N	874568	**401**	--	--	**401**	--	--	0.070	U	FBK	--	--	--	**100**	--	--	**22.0**	--	--	**0.340**	--	--	**45.5**	--	--	--	--	--	**27.0**	--	--
YVD-15	YVD-090918-11	9/9/2018	N	880601	**395**	--	--	**395**	--	--	0.070	U	--	--	--	--	**97.5**	--	--	**22.8**	--	--	**0.350**	--	--	**42.7**	--	--	--	--	--	**24.4**	--	--
YVD-15	YVD-121018-06	12/10/2018	N	884857	**400**	--	--	**400**	--	--	0.070	U	--	--	--	--	**92.5**	--	--	**24.3**	--	--	0.330	U	FBK	**41.0**	J	MSD	--	--	--	**26.3**	--	--
YVD-15	YVD-031719-10	3/17/2019	N	988239	**394**	--	--	**394**	--	--	0.070	U	--	--	--	--	**91.5**	--	--	**21.1**	--	--	0.310	U	FBK	**39.8**	--	--	--	--	--	**24.3**	--	--
YVD-15	YVD-060419-29	6/4/2019	N	992242	**390**	--	--	**390**	--	--	0.070	U	--	--	--	--	**92.0**	--	--	**19.5**	--	--	**0.300**	--	--	**40.8**	--	--	--	--	--	**23.6**	--	--
YVD-15	YVD-090919-11	9/9/2019	N	998357	**407**	--	--	**407**	--	--	0.070	U	--	--	--	--	**91.0**	--	--	**21.8**	--	--	**0.340**	--	--	**39.4**	--	--	--	--	--	**23.4**	--	--
YVD-15	YVD-121019-19	12/10/2019	N	902321	**400**	--	--	**400**	--	--	0.070	U	--	--	--	--	**88.0**	--	--	**20.5**	--	--	**0.370**	--	--	**38.7**	--	--	--	--	--	**23.5**	--	--
YVD-15	YVD-033020-06	3/30/2020	N	006241	**396**	--	--	**396**	--	--	0.070	U	--	--	--	--	**86.5**	--	--	**20.6**	--	--	**0.370**	--	--	**38.3**	--	--	--	--	--	**22.3**	--	--
YVD-15	YVD-060920-16	6/9/2020	N	009269	**397**	--	--	**397**	--	--	0.070	U	--	--	--	--	**86.5**	--	--	**20.8**	--	--	**0.310**	--	--	**38.1**	--	--	--	--	--	**21.0**	--	--
YVD-15	YVD-092020-09	9/20/2020	N	013864	**390**	--	--	**390**	--	--	0.070	U	--	--	--	--	**87.5**	--	--	**21.1**	--	--	**0.310**	--	--	**38.7**	--	--	--	--	--	**21.2**	--	--
YVD-15	YVD-120720-14	12/7/2020	N	017035	**390**	--	--	**390**	--	--	0.070	U	--	--	--	--	**87.0**	--	--	**20.7**	--	--	**0.420**	--	--	**39.0**	--	--	--	--	--	**19.7**	--	--
YVD-15	YVD-030121-14	3/1/2021	N	119931	**397**	--	--	**397**	--	--	0.070	U	--	--	--	--	**87.5**	--	--	**21.1**	--	--	**0.340**	--	--	**39.4**	--	--	--	--	--	**22.0**	--	--
YVD-15	YVD-060621-08	6/6/2021	N	124053	**428**	--	--	**428**	--	--	0.070	U	--	--	--	--	**94.5**	--	--	**21.8**	--	--	**0.290**	--	--	**41.7**	--	--	--	--	--	**21.6**	--	--
YVD-15	YVD-121421-07	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**15.1**	--	--
YVD-15	YVD-031422-05	3/14/2022	N	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**34.5**	--	--
YVD-15	YVD-060522-07	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**16.3**	--	--
YVD-15	YVD-091422-19	9/14/2022	N	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**17.3**	--	--
YVD-15	YVD-120622-07	12/6/2022	N	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**16.0**	--	--
YVD-15	YVD-030523-04	3/5/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**11.7**	--	--	--	--	--
YVD-15	YVD-062123-25	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**12.4**	J	HTQ
YVD-15	YVD-091123-20	9/11/2023	N	K2310209	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**13.0**	J	HTQ
YVD-15	YVD-120623-01	12/6/2023	N	K2313796	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**14.0**	J	HTQ
YVD-15	YVD-120623-02	12/6/2023	FD	K2313796	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**14.0**	J	HTQ
YVD-16	YVD-16-130923	09/23/2013	N	SWI0178	**391**	--	--	**391**	--	--	--	--	--	0.100	U	--	**85.0**	--	--	--	--	--	--	--	--	**32.9**	--	--	--	--	--	--	--	--
YVD-16	YVD-16-130926	09/26/2013	N	SWI0190	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**44.1**	--	--	5.00	U	--	--	--	--	--	--	--	**28.8**	--	--
YVD-16	YVD-16-131212	12/12/2013	N	SWL0073	**309**	--	--	**310**	--	--	--	--	--	0.020	UJ	MSD	**87.7**	--	--	**46.7**	--	--	5.00	U	--	**32.1**	--	--	--	--	--	**28.8**	--	--
YVD-16	YVD-16-140318	03/18/2014	N	SXC0107	**298**	--	--	**300**	--	--	--	--	--	0.100	U	--	**105**	--	--	**46.1**	--	--	5.00	U	--	**53.2**	--	--	--	--	--	**23.5**	--	--
YVD-16	YVD-16-140603	06/03/2014	N	SXF0017	**287**	--	--	**288**	--	--	--	--	--	0.100	U	--	**86.3**	--	--	**36.7**	--	--	2.00	U	--	**37.0**	--	--	--	--	--	**21.9**	--	--
YVD-16	YVD-16-140923	09/23/2014	N	SXI0173	**303**	--	--	**305**	--	--	--	--	--	0.100	U	--	**99.2**	--	--	**38.0**	--	--	2.50	U	--	**38.9**	--	--	--	--	--	**21.4**	--	--
YVD-16	YVD-16-141217	12/17/2014	N	SXL0121	**298**	--	--	**300**	--	--	--	--	--	0.100	U	--	**94.9**	--	--	**37.9**	--	--	2.50	U	--	**37.1**	--	--	--	--	--	**20.6**	--	--
YVD-16	YVD-D3-141217	12/17/2014	FD	SXL0121	**308**	--	--	**310**	--	--	--	--	--	0.100	U	--	**92.9**	--	--	**39.9**	--	--	2.50	U	--	**36.2**	--	--	--	--	--	**22.4**	--	--
YVD-16	YVD-16-150317	03/17/2015	N	5904651	**310**	--	--	**310**	--	--	--	--	--	**0.110**	--	--	**93.0**	--	--	**39.0**	--	--	2.50	U	--	**34.0**	--	--	--	--	--	**22.0**	--	--
YVD-16	YVD-16-150616	06/16/2015	N	59010961	**310**	--	--	**310**	--	--	--	--	--	**0.100**	--	--	**96.0**	--	--	**43.0**	--	--	2.50	U	--	**35.0**	--	--	--	--	--	**23.0**	--	--
YVD-16	YVD-16-150923	09/23/2015	N	59020281	**330**	--	--	**330**	--	--	--	--	--	0.100	U	--	**88.0**	--	--	**39.0**	--	--	2.50	U	--	**37.0**	--	--	--	--	--	**23.0**	--	--
YVD-16	YVD-16-151215	12/15/2015	N	59025431	**350**	J	FDP	**350**	J	FDP	--	--	--	--	R	MSD	**89.0**	--	--	**38.0**	--	--	2.50	U	--	**34.0**	--	--	--	--	--	**22.0**	--	--
YVD-16	YVD-16-160309	03/09/2016	N	59029711	**300**	--	--	**300**	--	--	--	--	--	**0.150**	J	FDP	**90.0**	--	--	**39.0**	--	--	2.50	U	--	**36.0**	--	--	--	--	--	**23.0**	--	--
YVD-16	YVD-16-160621	6/21/2016	N	59037151	**300**	--	--	**300**	--	--	--	--	--	0.100	U	--	**85.0**	--	--	**42.0**	--	--	2.50	U	--	**33.0**	--	--	--	--	--	**22.0**	--	--
YVD-16	YVD-D2-160621	6/21/2016	FD	59037151	**300**	--	--	**300**	--	--	--	--	--	0.100	U	--	**86.0**	--	--	**40.0**	--	--	0.500	U	--	**34.0**	--	--	--	--	--	**22.0**	--	--
YVD-16	YVD-16-160928	9/28/2016	N	K1611629	**301**	--	--	**301**	--	--	--	--	--	0.050	U	MBK	**92.4**	--	--	**33.3**	--	--	**0.220**	--	--	**33.2**	--	--	--	--	--	**19.7**	--	--
YVD-16	YVD-16-161215	12/15/2016	N	K1615126	**298**	--	--	**298**	--	--	--	--	--	0.050	U	--	**88.4**	--	--	**33.7**	--	--	**0.240**	--	--	**31.1**	--	--	--	--	--	**19.7**	--	--
YVD-16	YVD-030917-22	3/9/2017	N	K1702404	**295**	--	--	**295**	--	--	--	--	--	0.050	U	--	**87.1**	--	--	**33.9**	--	--	**0.250**	--	--	**31.2**	--	--	--	--	--	**20.1**	J	HTQ
YVD-16	YVD-060517-12	6/5/2017	N	K1705754	**298**	--	--	**298**	--	--	--	--	--	0.050	U	--	**86.8**	--	--	**33.6**	--	--	**0.250**	--	--	**31.6**	--	--	--	--	--	**19.7**	--	--
YVD-16	YVD-092617-28	9/26/2017	N	K1710381	**309**	--	--	**309**	--	--	--	--	--	0.050	U	--	**89.0**	--	--	**32.8**	--	--	**0.230**	--	--	**31.7**	--	--	--	--	--	**19.1**	J	HTQ

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			EPA 350.1			SM 4500 NH3--G			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-16	YVD-120517-22	12/5/2017	N	K1713091	**294**	--	--	**294**	--	--	--	--	--	0.050	U	--	**87.9**	--	--	**33.3**	--	--	**0.240**	--	--	**30.1**	--	--	--	--	--	**19.8**	J	HTQ
YVD-16	YVD-031918-16	3/19/2018	N	870634	**297**	--	--	**297**	--	--	0.070	U	--	--	--	--	**88.5**	--	--	**34.4**	--	--	**0.200**	--	--	**30.3**	--	--	--	--	--	**20.3**	--	--
YVD-16	YVD-060318-10	6/3/2018	N	874568	**314**	--	--	**314**	--	--	0.070	U	FBK	--	--	--	**90.0**	--	--	**34.9**	--	--	**0.220**	--	--	**32.8**	--	--	--	--	--	**20.7**	--	--
YVD-16	YVD-090918-07	9/9/2018	N	880601	**309**	--	--	**309**	--	--	0.070	U	--	--	--	--	**89.5**	--	--	**35.7**	--	--	**0.210**	--	--	**30.6**	--	--	--	--	--	**21.4**	--	--
YVD-16	YVD-121118-20	12/11/2018	N	884939	**306**	--	--	**306**	--	--	0.070	U	--	--	--	--	**89.5**	--	--	**32.6**	--	--	**0.190**	--	--	**31.1**	--	--	--	--	--	**21.8**	--	--
YVD-16	YVD-031719-08	3/17/2019	N	988239	**300**	--	--	**300**	--	--	0.070	U	--	--	--	--	**88.5**	--	--	**35.4**	--	--	0.180	U	FBK	**30.7**	--	--	--	--	--	**22.5**	--	--
YVD-16	YVD-060219-06	6/2/2019	N	991939	**301**	--	--	**301**	--	--	0.070	U	--	--	--	--	**88.5**	--	--	24.6	U	FBK	0.170	U	FBK	**30.9**	--	--	--	--	--	**23.3**	--	--
YVD-16	YVD-090919-07	9/9/2019	N	998357	**303**	--	--	**303**	--	--	0.070	U	--	--	--	--	**86.5**	--	--	**36.9**	--	--	**0.210**	--	--	**30.4**	--	--	--	--	--	**22.9**	--	--
YVD-16	YVD-120919-11	12/9/2019	N	902276	**296**	--	--	**296**	--	--	0.070	U	--	--	--	--	**86.0**	--	--	**36.7**	--	--	**0.240**	--	--	**30.4**	--	--	--	--	--	**23.5**	--	--
YVD-16	YVD-033120-16	3/31/2020	N	006260	**287**	--	--	**287**	--	--	0.070	U	--	--	--	--	**85.5**	--	--	**38.0**	--	--	**0.180**	--	--	**30.3**	--	--	--	--	--	**22.8**	--	--
YVD-16	YVD-061020-30	6/10/2020	N	009361	**289**	--	--	**289**	--	--	0.070	U	--	--	--	--	**81.5**	--	--	**37.8**	--	--	**0.170**	--	--	**28.8**	J	MS	--	--	--	**21.8**	--	--
YVD-16	YVD-092020-06	9/20/2020	N	013864	**292**	--	--	**292**	--	--	0.070	U	--	--	--	--	**88.0**	--	--	**39.0**	--	--	**0.170**	--	--	**31.4**	--	--	--	--	--	**22.4**	--	--
YVD-16	YVD-120720-08	12/7/2020	N	017035	**298**	--	--	**298**	--	--	0.070	U	--	--	--	--	**92.5**	--	--	**41.2**	--	--	**0.190**	--	--	**33.2**	--	--	--	--	--	**24.6**	--	--
YVD-16	YVD-030121-02	3/1/2021	N	119931	**290**	--	--	**290**	--	--	0.070	U	--	--	--	--	**90.0**	--	--	**42.9**	--	--	**0.200**	--	--	**32.1**	--	--	--	--	--	**24.3**	--	--
YVD-16	YVD-030121-04	3/1/2021	FD	119931	**288**	--	--	**288**	--	--	0.070	U	--	--	--	--	**91.5**	--	--	**42.9**	--	--	**0.200**	--	--	**32.7**	--	--	--	--	--	**24.7**	--	--
YVD-16	YVD-060621-03	6/6/2021	N	124053	**299**	--	--	**299**	--	--	0.070	U	--	--	--	--	**88.5**	--	--	**37.5**	--	--	**0.160**	--	--	**31.9**	--	--	--	--	--	**21.8**	--	--
YVD-16	YVD-121421-02	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**19.7**	J	HTQ, MS
YVD-16	YVD-121421-03	12/14/2021	FD	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**20.1**	--	--
YVD-16	YVD-031522-17	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**21.4**	--	--
YVD-16	YVD-060622-16	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**21.0**	--	--
YVD-16	YVD-091322-08	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**22.7**	--	--
YVD-16	YVD-120622-05	12/6/2022	N	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**21.9**	--	--
YVD-16	YVD-030523-05	3/5/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**22.0**	--	--	--	--	--
YVD-16	YVD-030523-06	3/5/2023	FD	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**22.0**	--	--	--	--	--
YVD-16	YVD-062023-13	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**24.8**	J	HTQ
YVD-16	YVD-091123-17	9/11/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**25.3**	--	--
YVD-16	YVD-120423-07	12/4/2023	N	K2313548	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**25.5**	J	HTQ
YVD-17	YVD-17-130919	09/19/2013	N	SWI0142	**213**	--	--	**215**	--	--	--	--	--	0.100	U	--	**72.7**	--	--	**3.10**	--	--	0.500	U	--	**35.8**	--	--	--	--	--	--	--	--
YVD-17	YVD-17-130924	09/24/2013	N	SWI0175	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**0.800**	--	--
YVD-17	YVD-17-131210	12/10/2013	N	SWL0055	**169**	--	--	**170**	--	--	--	--	--	0.020	UJ	MSD	**54.2**	--	--	**2.98**	--	--	0.500	U	--	**28.4**	--	--	--	--	--	**0.680**	--	--
YVD-17	YVD-17-140316	03/16/2014	N	SXC0081	**144**	--	--	**145**	--	--	--	--	--	**0.166**	--	--	**36.0**	--	--	**3.45**	--	--	**0.650**	--	--	**17.6**	--	--	--	--	--	**1.07**	--	--
YVD-17	YVD-17-140601	06/01/2014	N	SXF0008	**169**	--	--	**170**	--	--	--	--	--	0.100	U	--	**42.3**	--	--	**3.17**	--	--	0.500	U	--	**18.5**	--	--	--	--	--	**0.670**	--	--
YVD-17	YVD-17-140922	09/22/2014	N	SXI0148	**183**	--	--	**185**	--	--	--	--	--	0.100	U	--	**47.5**	--	--	**2.87**	--	--	0.500	U	--	**21.2**	--	--	--	--	--	**0.960**	--	--
YVD-17	YVD-17-141215	12/15/2014	N	SXL0103	**168**	--	--	**170**	--	--	--	--	--	0.100	U	--	**42.1**	--	--	**2.99**	J+	MSD	0.500	U	--	**17.8**	--	--	--	--	--	**0.660**	J	DUP
YVD-17	YVD-17-150316	03/16/2015	N	5904471	**130**	--	--	**130**	--	--	--	--	--	0.100	U	--	**33.0**	--	--	**3.50**	--	--	**0.500**	--	--	**17.0**	--	--	--	--	--	**1.10**	--	--
YVD-17	YVD-D1-150316	03/16/2015	FD	5904471	**130**	--	--	**130**	--	--	--	--	--	0.100	U	--	**33.0**	--	--	**3.50**	--	--	**0.510**	--	--	**17.0**	--	--	--	--	--	**1.20**	--	--
YVD-17	YVD-17-150617	06/17/2015	N	59010961	**160**	--	--	**160**	--	--	--	--	--	0.100	U	--	**41.0**	--	--	**3.00**	--	--	0.500	U	--	**18.0**	--	--	--	--	--	**0.590**	--	--
YVD-17	YVD-17-150924	09/24/2015	N	59020391	**170**	--	--	**170**	--	--	--	--	--	0.100	UJ	MSD	**40.0**	--	--	**3.10**	--	--	**0.600**	--	--	**18.0**	--	--	--	--	--	0.200	U	--
YVD-17	YVD-17-151216	12/16/2015	N	59025501	**180**	--	--	**180**	--	--	--	--	--	--	R	MSD	**38.0**	--	--	**2.60**	--	--	0.500	U	--	**17.0**	--	--	--	--	--	**0.550**	--	--
YVD-17	YVD-17-160310	03/10/2016	N	59029941	**150**	--	--	**150**	--	--	--	--	--	0.100	U	--	**35.0**	--	--	**2.80**	--	--	0.500	U	--	**16.0**	--	--	--	--	--	**0.320**	--	--
YVD-17	YVD-17-160623	6/23/2016	N	59037371	**170**	--	--	**170**	--	--	--	--	--	--	R	MSD	**39.0**	--	--	**3.40**	--	--	0.500	U	--	**18.0**	--	--	--	--	--	**0.550**	--	--
YVD-17	YVD-17-160926	9/26/2016	N	K1611565	**182**	--	--	**182**	--	--	--	--	--	0.050	U	MBK	**40.8**	--	--	**2.91**	--	--	**0.320**	--	--	**17.3**	--	--	--	--	--	**1.16**	--	--
YVD-17	YVD-17-161215	12/15/2016	N	K1615174	**154**	--	--	**157**	J	--	--	--	--	0.050	U	--	**39.6**	--	--	**2.42**	--	--	**0.340**	--	--	**15.8**	--	--	--	--	--	**0.590**	--	--
YVD-17	YVD-031017-29	3/10/2017	N	K1702448	**142**	--	--	**156**	J	--	--	--	--	0.050	U	--	**36.6**	--	--	**2.65**	--	--	**0.330**	--	--	**15.7**	--	--	--	--	--	**0.420**	--	--
YVD-17	YVD-060617-24	6/6/2017	N	K1705754	**167**	--	--	**167**	--	--	--	--	--	0.050	U	--	**40.2**	--	--	**2.40**	--	--	**0.350**	--	--	**15.8**	--	--	--	--	--	**0.500**	--	--
YVD-17	YVD-092517-08	9/25/2017	N	K1710274	**179**	--	--	**179**	--	--	--	--	--	0.050	U	--	**43.1**	--	--	**2.89**	--	--	**0.370**	--	--	**16.4**	--	--	--	--	--	**0.990**	--	--
YVD-17	YVD-120517-26	12/5/2017	N	K1713091	**187**	--	--	**187**	--	--	--	--	--	0.050	U	--	**43.6**	--	--	**2.71**	--	--	**0.390**	--	--	**15.4**	--	--	--	--	--	**0.710**	--	--
YVD-17	YVD-060418-20	6/4/2018	N	874662	**160**	--	--	**160**	--	--	0.090	U	FBK	--	--	--	**39.1**	--	--	**2.87**	--	--	**0.300**	--	--	**16.5**	--	--	--	--	--	**0.660**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			EPA 350.1			SM 4500 NH3--G			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-17	YVD-060219-12	6/2/2019	N	991939	**149**	--	--	**149**	--	--	0.070	U	--	--	--	--	**35.0**	--	--	2.91	U	FBK	0.240	U	FBK	**15.2**	--	--	--	--	--	**0.490**	--	--
YVD-17	YVD-060820-10	6/8/2020	N	009144	**146**	--	--	**146**	--	--	0.070	U	--	--	--	--	**34.4**	--	--	**3.17**	--	--	**0.250**	--	--	**15.2**	--	--	--	--	--	**0.700**	--	--
YVD-17	YVD-060621-04	6/6/2021	N	124053	**144**	--	--	**144**	--	--	0.070	U	--	--	--	--	**33.3**	--	--	**2.36**	J	FDP	**0.190**	--	--	**14.6**	--	--	--	--	--	**0.400**	--	--
YVD-17	YVD-060621-05	6/6/2021	FD	124053	**144**	--	--	**144**	--	--	0.070	U	--	--	--	--	**33.5**	--	--	**2.99**	J	FDP	**0.240**	--	--	**14.7**	--	--	--	--	--	**0.470**	--	--
YVD-17	YVD-060622-14	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**0.610**	--	--
YVD-17	YVD-062023-15	6/20/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**0.62**	J	HTQ
YVD-18	YVD-18-130919	09/19/2013	N	SWI0142	**119**	--	--	**120**	--	--	--	--	--	0.100	U	--	**42.9**	--	--	**61.4**	--	--	5.00	U	--	**13.7**	--	--	--	--	--	--	--	--
YVD-18	YVD-18-130925	09/25/2013	N	SWI0175	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**13.6**	--	--
YVD-18	YVD-18-131211	12/11/2013	N	SWL0073	**109**	--	--	**110**	--	--	--	--	--	0.020	UJ	MSD	**50.4**	--	--	**62.9**	--	--	5.00	U	--	**17.1**	--	--	--	--	--	**14.2**	J	FDP
YVD-18	YVD-D2-131211	12/11/2013	FD	SWL0073	**114**	--	--	**115**	--	--	--	--	--	0.020	UJ	MSD	**50.2**	--	--	**66.5**	--	--	5.00	U	--	**16.7**	--	--	--	--	--	**23.5**	J	FDP
YVD-18	YVD-18-140318	03/18/2014	N	SXC0095	**119**	--	--	**120**	--	--	--	--	--	**0.134**	J	FDP	**51.7**	--	--	**66.7**	--	--	5.00	U	--	**16.5**	--	--	--	--	--	**18.8**	--	--
YVD-18	YVD-D2-140318	03/18/2014	FD	SXC0095	**124**	--	--	**125**	--	--	--	--	--	**0.280**	J	FDP	**52.0**	--	--	**62.1**	--	--	5.00	U	--	**16.6**	--	--	--	--	--	**17.1**	--	--
YVD-18	YVD-18-140603	06/03/2014	N	SXF0017	**117**	--	--	**118**	--	--	--	--	--	0.100	U	--	**46.8**	--	--	**64.0**	--	--	2.00	U	--	**15.4**	--	--	--	--	--	**16.9**	--	--
YVD-18	YVD-18-140923	09/23/2014	N	SXI0173	**114**	--	--	**115**	--	--	--	--	--	0.100	U	--	**48.5**	--	--	**54.7**	--	--	2.50	U	--	**15.6**	--	--	--	--	--	**13.8**	--	--
YVD-18	YVD-18-141216	12/16/2014	N	SXL0121	**114**	--	--	**115**	--	--	--	--	--	0.100	U	--	**52.7**	--	--	**59.6**	--	--	2.50	U	--	**17.7**	--	--	--	--	--	**16.5**	--	--
YVD-18	YVD-18-150317	03/17/2015	N	5904541	**110**	--	--	**110**	--	--	--	--	--	0.100	U	--	**56.0**	--	--	**64.0**	--	--	2.50	U	--	**19.0**	--	--	--	--	--	**20.0**	J-	MSD
YVD-18	YVD-18-150617	06/17/2015	N	59010961	**110**	--	--	**110**	--	--	--	--	--	0.100	U	--	**55.0**	--	--	**65.0**	--	--	2.50	U	--	**18.0**	--	--	--	--	--	**17.0**	--	--
YVD-18	YVD-18-150924	09/24/2015	N	59020391	**120**	--	--	**120**	--	--	--	--	--	0.100	UJ	MSD	**52.0**	--	--	**63.0**	--	--	2.50	U	--	**19.0**	--	--	--	--	--	**20.0**	J+	MSD
YVD-18	YVD-18-151216	12/16/2015	N	59025501	**120**	--	--	**120**	--	--	--	--	--	--	R	MSD	**60.0**	--	--	**66.0**	--	--	2.50	U	--	**20.0**	--	--	--	--	--	**23.0**	--	--
YVD-18	YVD-18-160309	03/09/2016	N	59029941	**120**	--	--	**120**	--	--	--	--	--	0.100	U	--	**62.0**	--	--	**63.0**	--	--	2.50	U	--	**21.0**	--	--	--	--	--	**22.0**	--	--
YVD-18	YVD-18-160622	6/22/2016	N	59037271	**130**	--	--	**130**	--	--	--	--	--	0.100	UJ	MSD	**55.0**	--	--	**61.0**	--	--	2.50	U	--	**19.0**	--	--	--	--	--	**21.0**	--	--
YVD-18	YVD-18-160928	9/28/2016	N	K1611629	**114**	--	--	**114**	--	--	--	--	--	0.050	U	MBK	**58.2**	--	--	**56.8**	--	--	**0.360**	--	--	**19.7**	--	--	--	--	--	**20.5**	--	--
YVD-18	YVD-18-161214	12/14/2016	N	K1615083	**111**	--	--	**111**	--	--	--	--	--	0.050	U	--	**62.5**	--	--	**56.3**	--	--	**0.380**	--	--	**19.6**	--	--	--	--	--	**21.5**	--	--
YVD-18	YVD-D3-161214	12/14/2016	FD	K1615083	**111**	--	--	**111**	--	--	--	--	--	**0.115**	--	--	**60.6**	--	--	**56.4**	--	--	**0.370**	--	--	**20.1**	--	--	--	--	--	**21.5**	--	--
YVD-18	YVD-030617-05	3/6/2017	N	K1702324	**110**	--	--	**110**	--	--	--	--	--	1.00	U	--	**65.4**	--	--	**55.9**	--	--	**0.400**	--	--	**20.5**	--	--	--	--	--	**23.7**	J	HTQ
YVD-18	YVD-060717-31	6/7/2017	N	K1705833	**114**	--	--	**114**	--	--	--	--	--	0.050	U	--	**65.2**	--	--	**57.0**	--	--	**0.340**	--	--	**21.4**	--	--	--	--	--	**22.9**	--	--
YVD-18	YVD-092617-27	9/26/2017	N	K1710333	**115**	--	--	**115**	--	--	--	--	--	0.050	U	--	**58.5**	--	--	**54.8**	--	--	**0.380**	--	--	**18.3**	--	--	--	--	--	**21.6**	--	--
YVD-18	YVD-120417-05	12/4/2017	N	K1713026	**114**	--	--	**114**	--	--	--	--	--	0.050	U	--	**62.6**	--	--	**58.9**	--	--	**0.400**	--	--	**20.0**	--	--	--	--	--	**24.4**	--	--
YVD-18	YVD-031918-17	3/19/2018	N	870634	**111**	--	--	**111**	--	--	0.070	U	--	--	--	--	**67.5**	--	--	**68.2**	--	--	**0.340**	--	--	**22.0**	--	--	--	--	--	**27.7**	--	--
YVD-18	YVD-060318-07	6/3/2018	N	874568	**110**	--	--	**110**	--	--	0.070	U	--	--	--	--	**70.0**	--	--	**65.9**	--	--	**0.330**	--	--	**23.3**	--	--	--	--	--	**26.3**	--	--
YVD-18	YVD-090918-12	9/9/2018	N	880601	**112**	--	--	**112**	--	--	0.070	U	--	--	--	--	**67.5**	--	--	**67.1**	--	--	**0.350**	--	--	**22.1**	--	--	--	--	--	**26.0**	--	--
YVD-18	YVD-121018-09	12/10/2018	N	884857	**115**	--	--	**115**	--	--	0.070	U	--	--	--	--	**68.0**	--	--	**66.8**	--	--	0.320	U	FBK	**22.0**	J	MSD	--	--	--	**27.0**	--	--
YVD-18	YVD-031819-13	3/18/2019	N	988273	**118**	--	--	**118**	--	--	0.070	U	--	--	--	--	**75.0**	--	--	**74.5**	--	--	**0.730**	--	--	**23.7**	--	--	--	--	--	**29.8**	--	--
YVD-18	YVD-060319-23	6/3/2019	N	992053	**118**	--	--	**118**	--	--	0.070	U	--	--	--	--	**75.0**	--	--	**71.0**	--	--	**0.250**	--	--	**23.4**	--	--	--	--	--	**28.4**	--	--
YVD-18	YVD-090919-06	9/9/2019	N	998357	**115**	--	--	**115**	--	--	0.070	U	--	--	--	--	**65.0**	--	--	**61.5**	--	--	**0.380**	--	--	**20.7**	--	--	--	--	--	**28.4**	--	--
YVD-18	YVD-090919-08	9/9/2019	FD	998357	**114**	--	--	**114**	--	--	0.070	U	--	--	--	--	**65.5**	--	--	**60.9**	--	--	**0.380**	--	--	**20.8**	--	--	--	--	--	**28.3**	--	--
YVD-18	YVD-120919-08	12/9/2019	N	902276	**113**			**113**			0.070	U		--	--	--	**70.0**			**68.1**			**0.340**			**23.0**			--	--	--	**28.8**		
YVD-18	YVD-033020-07	3/30/2020	N	006241	**117**	--	--	**117**	--	--	0.070	U	--	--	--	--	**73.5**	--	--	**71.6**	--	--	**0.300**	--	--	**23.3**	--	--	--	--	--	**28.5**	--	--
YVD-18	YVD-060920-19	6/9/2020	N	009269	**120**	--	--	**120**	--	--	0.070	U	--	--	--	--	**70.5**	--	--	**69.1**	--	--	**0.290**	--	--	**22.5**	--	--	--	--	--	**27.4**	--	--
YVD-18	YVD-092120-15	9/21/2020	N	013896	**115**	--	--	**115**	--	--	0.070	U	--	--	--	--	**67.0**	--	--	**70.9**	--	--	**0.310**	--	--	**21.6**	--	--	--	--	--	**27.4**	--	--
YVD-18	YVD-092120-17	9/21/2020	FD	013896	**113**	--	--	**113**	--	--	0.070	U	--	--	--	--	**65.5**	--	--	**70.4**	--	--	**0.310**	--	--	**21.2**	--	--	--	--	--	**27.2**	--	--
YVD-18	YVD-120820-15	12/8/2020	N	017137	**116**	--	--	**116**	--	--	0.070	U	--	--	--	--	**71.0**	--	--	**64.8**	--	--	**0.420**	--	--	**22.7**	--	--	--	--	--	**26.6**	--	--
YVD-18	YVD-030221-17	3/2/2021	N	120034	**122**	--	--	**122**	--	--	0.070	U	--	--	--	--	**76.0**	--	--	**72.2**	--	--	**0.310**	--	--	**23.7**	--	--	--	--	--	**28.2**	--	--
YVD-18	YVD-060821-30	6/8/2021	N	124212	**120**	--	--	**120**	--	--	0.070	U	--	--	--	--	**71.0**	--	--	**75.8**	--	--	**0.310**	--	--	**22.8**	--	--	--	--	--	**31.8**	--	--
YVD-18	YVD-121521-12	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**26.6**	J	HTQ, MS, MS
YVD-18	YVD-121521-14	12/15/2021	FD	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**26.7**	J	HTQ, MS, MS
YVD-18	YVD-031522-18	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**30.0**	--	--
YVD-18	YVD-060722-25	6/7/2022	N	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**30.9**	J	HTQ

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			EPA 350.1			SM 4500 NH3--G			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-18	YVD-060722-26	6/7/2022	FD	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**30.5**	J	HTQ
YVD-18	YVD-091322-13	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**27.6**	--	--
YVD-18	YVD-122722-16	12/27/2022	N	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**28.1**	--	--
YVD-18	YVD-122722-17	12/27/2022	FD	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**28.6**	--	--
YVD-18	YVD-030623-11	3/6/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**33.1**	--	--	--	--	--
YVD-18	YVD-062023-16	6/20/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**32.1**	J	HTQ
YVD-18	YVD-091123-23	9/11/2023	N	K2310209	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**28.4**	J	HTQ
YVD-18	YVD-120423-11	12/4/2023	N	K2313657	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**30.2**	J	HTQ
Equipment Blank	YVD-EB-130918	09/18/2013	EB	SWI0123	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Equipment Blank	YVD-EB-130925	09/25/2013	EB	SWI0175	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Equipment Blank	YVD-EB-131212	12/12/2013	EB	SWL0078	4.00	U	--	4.00	U	--	0.020	U	--	0.020	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Equipment Blank	YVD-EB-140317	03/17/2014	EB	SXC0081	4.00	U	--	4.00	U	--	**0.124**	--	--	**0.124**	--	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Equipment Blank	YVD-EB-140318	03/18/2014	EB	SXC0095	4.00	U	--	4.00	U	--	**0.130**	--	--	**0.130**	--	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Equipment Blank	YVD-EB-140319	03/19/2014	EB	SXC0107	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Equipment Blank	YVD-EB-140604	06/04/2014	EB	SXF0025	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	**1.46**	--	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Equipment Blank	YVD-EB-140924	09/24/2014	EB	SXI0173	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Equipment Blank	YVD-EB-141217	12/17/2014	EB	SXL0144	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	**0.900**	--	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Equipment Blank	YVD-EB-150617	06/17/2015	EB	59011021	**5.00**	--	--	**5.00**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Equipment Blank	YVD-EB-150925	09/25/2015	EB	59020431	4.00	U	--	4.00	U	--	**0.100**	--	--	**0.100**	--	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Equipment Blank	YVD-EB-151216	12/16/2015	EB	59025501	**5.00**	--	--	**5.00**	--	--	**0.120**	J-	MSD	**0.120**	J-	MSD	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Equipment Blank	YVD-EB-160310	03/10/2016	EB	59029941	**15.0**	--	--	**15.0**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	**1.10**	--	--	**0.670**	--	--	0.500	U	--	--	--	--	0.200	U	--
Equipment Blank	YVD-EB-160623	6/23/2016	EB	59037371	**5.00**	--	--	**5.00**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Equipment Blank	YVD-EB-160926	9/26/2016	EB	K1611506	2.00	U	--	2.00	U	--	0.050	U	MBK	0.050	U	MBK	**0.097**	--	--	0.200	U	--	0.200	U	--	**0.035**	--	--	--	--	--	0.100	U	--
Equipment Blank	YVD-EB-160927	9/27/2016	EB	K1611629	2.00	U	--	2.00	U	--	0.050	U	MBK	0.050	U	MBK	**0.011**	J	--	0.100	U	--	0.100	U	--	**0.000**	J	--	--	--	--	0.050	UJ	HTQ
Equipment Blank	YVD-EB-160928	9/28/2016	EB	K1611629	2.00	U	--	2.00	U	--	0.050	U	MBK	0.050	U	MBK	**0.050**	J	--	**0.030**	J	--	0.100	U	--	0.050	U	--	--	--	--	0.050	U	--
Equipment Blank	YVD-EB1-161214	12/14/2016	EB	K1615083	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Equipment Blank	YVD-EB2-161215	12/15/2016	EB	K1615126	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Equipment Blank	YVD-EB3-161216	12/16/2016	EB	K1615174	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.035	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-F1-130916	09/16/2013	FB	SWI0113	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F2-130917	09/17/2013	FB	SWI0113	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F3-130918	09/18/2013	FB	SWI0123	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F4-130918	09/18/2013	FB	SWI0138	4.00	U	--	4.00	U	--	**0.120**	--	--	**0.120**	--	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F5-130919	09/19/2013	FB	SWI0142	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	--	--	--
Field Blank	YVD-F6-130923	09/23/2013	FB	SWI0178	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	--	--	--	--	--	--	0.500	U	--	--	--	--	--	--	--
Field Blank	YVD-F7-130924	09/24/2013	FB	SWI0175	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			EPA 350.1			SM 4500 NH3--G			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
Field Blank	YVD-F7-130926	09/26/2013	FB	SWI0190	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.800	U	--	0.500	U	--	--	--	--	--	--	--	0.200	U	--
Field Blank	YVD-F1-131209	12/09/2013	FB	SWL0055	4.00	U	--	4.00	U	--	0.020	U	--	0.020	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F2-131210	12/10/2013	FB	SWL0063	4.00	U	--	4.00	U	--	0.020	U	--	0.020	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F3-131211	12/11/2013	FB	SWL0073	4.00	U	--	4.00	U	--	0.020	U	--	0.020	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F4-131212	12/12/2013	FB	SWL0078	4.00	U	--	4.00	U	--	0.020	U	--	0.020	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F1-140316	03/16/2014	FB	SXC0081	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F2-140317	03/17/2014	FB	SXC0095	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F3-140318	03/18/2014	FB	SXC0107	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F4-140319	03/19/2014	FB	SXC0107	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F1-140601	06/01/2014	FB	SXF0008	**4.25**	--	--	**4.25**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F2-140602	06/02/2014	FB	SXF0017	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F3-140603	06/03/2014	FB	SXF0025	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F1-140921	09/21/2014	FB	SXI0148	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F2-140922	09/22/2014	FB	SXI0148	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F3-140923	09/23/2014	FB	SXI0158	4.00	U	--	4.00	U	--	**0.128**	--	--	**0.128**	--	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F4-140924	09/24/2014	FB	SXI0173	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F1-141215	12/15/2014	FB	SXL0103	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	UJ	DUP
Field Blank	YVD-F2-141215	12/15/2014	FB	SXL0108	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F3-141216	12/16/2014	FB	SXL0121	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F4-141217	12/17/2014	FB	SXL0144	4.00	U	--	4.00	U	--	**0.101**	--	--	**0.101**	--	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	--	R	HTQ
Field Blank	YVD-F1-150315	03/15/2015	FB	5904471	**15.0**	--	--	**15.0**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F2-150316	03/16/2015	FB	5904541	**7.50**	--	--	**7.50**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F3-150317	03/17/2015	FB	5904651	**4.50**	--	--	**4.50**	--	--	0.100	U	--	0.100	U	--	**1.20**	--	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F1-150615	06/15/2015	FB	59010751	**10.0**	--	--	**10.0**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F2-150616	06/16/2015	FB	59010961	**5.00**	--	--	**5.00**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F3-150617	06/17/2015	FB	59011021	**5.00**	--	--	**5.00**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F1-150922	09/22/2015	FB	59020141	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F2-150923	09/23/2015	FB	59020281	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F3-150923	09/23/2015	FB	59020391	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F4-150924	09/24/2015	FB	59020391	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F5-150925	09/25/2015	FB	59020431	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F1-151213	12/13/2015	FB	59025351	**5.00**	--	--	**5.00**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F2-151214	12/14/2015	FB	59025431	**5.00**	--	--	**5.00**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F3-151215	12/15/2015	FB	59025501	**5.00**	--	--	**5.00**	--	--	--	R	MSD	--	R	MSD	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F4-151216	12/16/2015	FB	59025501	**5.00**	--	--	**5.00**	--	--	--	R	MSD	--	R	MSD	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F1-160307	03/07/2016	FB	59029521	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F2-160308	03/08/2016	FB	59029711	4.00	U	--	4.00	U	--	**0.190**	--	--	**0.190**	--	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F3-160309	03/09/2016	FB	59029941	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F4-160310	03/10/2016	FB	59029941	**13.0**	--	--	**13.0**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F1-160620	6/20/2016	FB	59037101	**5.00**	--	--	**5.00**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F2-160621	6/21/2016	FB	59037151	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F3-160622	6/22/2016	FB	59037271	**5.00**	--	--	**5.00**	--	--	**0.220**	--	--	**0.220**	--	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-F4-160623	6/23/2016	FB	59037371	**10.0**	--	--	**10.0**	--	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Field Blank	YVD-FB-160926	9/26/2016	FB	K1611506	2.00	U	--	2.00	U	--	0.050	U	MBK	0.050	U	MBK	0.020	U	MBK	0.200	U	--	0.200	U	--	**0.003**	J	--	--	--	--	0.100	U	--
Field Blank	YVD-FB-160927	9/27/2016	FB	K1611565	2.00	U	--	2.00	U	--	0.050	U	MBK	0.050	U	MBK	0.020	U	MBK	0.200	U	--	0.200	U	--	0.050	U	--	--	--	--	0.100	U	--
Field Blank	YVD-FB-160928	9/28/2016	FB	K1611629	15.0	U	--	15.0	U	--	0.050	U	MBK	0.050	U	MBK	**0.050**	J	--	0.100	U	--	0.100	U	--	0.050	U	--	--	--	--	0.050	U	--
Field Blank	YVD-FB-160929	9/29/2016	FB	K1611698	2.00	U	--	2.00	U	--	0.050	U	MBK	0.050	U	MBK	**0.070**	J	--	0.200	U	--	0.200	U	--	0.050	U	--	--	--	--	0.100	U	--
Field Blank	YVD-FB1-161212	12/12/2016	FB	K1615029	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	HTQ
Field Blank	YVD-FB2-161213	12/13/2016	FB	K1615045	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-FB3-161214	12/14/2016	FB	K1615083	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	--	--	--	--	0.100	U	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			EPA 350.1			SM 4500 NH3--G			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
Field Blank	YVD-FB4-161215	12/15/2016	FB	K1615126	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-FB5-161216	12/16/2016	FB	K1615174	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-030617-01	3/6/2017	FB	K1702228	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-030717-06	3/7/2017	FB	K1702324	2.00	U	--	2.00	U	--	1.00	U	--	1.00	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	UJ	HTQ
Field Blank	YVD-030817-11	3/8/2017	FB	K1702324	2.00	U	--	2.00	U	--	1.00	U	--	1.00	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-030917-17	3/9/2017	FB	K1702404	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-031017-26	3/10/2017	FB	K1702448	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-031317-30	3/13/2017	FB	K1702489	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-060417-01	6/4/2017	FB	K1705702	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.025	U	MBK	21.000	U	--	0.200	U	--	0.005	U	MBK	--	--	--	5.30	U	--
Field Blank	YVD-060517-07	6/5/2017	FB	K1705702	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.029	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-060617-17	6/6/2017	FB	K1705754	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-060717-28	6/7/2017	FB	K1705833	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-092517-01	9/25/2017	FB	K1710274	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	**0.002**	J	--	--	--	--	0.100	U	--
Field Blank	YVD-092617-16	9/26/2017	FB	K1710333	2.00	U	--	2.00	U	--	0.050	U	--	0.050	U	--	0.026	U	MBK	0.200	U	--	0.200	U	--	0.008	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-120417-01	12/4/2017	FB	K1713026	15.0	U	MBK	15.0	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-120517-32	12/5/2017	FB	K1713091	15.0	U	MBK	15.0	U	--	0.050	U	--	0.050	U	--	0.021	U	MBK	**0.420**	--	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	HTQ
Field Blank	YVD-120617-25	12/6/2017	FB	K1713157	15.0	U	MBK	15.0	U	--	0.050	U	MBK	0.050	U	MBK	0.021	U	MBK	0.200	U	--	0.200	U	--	0.005	U	MBK	--	--	--	0.100	U	--
Field Blank	YVD-031818-01	3/18/2018	FB	870610	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-031918-10	3/19/2018	FB	870634	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-060318-01	6/3/2018	FB	874568	5.00	U	--	5.00	U	--	**0.180**	--	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-060418-12	6/4/2018	FB	874568	5.00	U	--	5.00	U	--	**0.080**	--	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-060518-26	6/5/2018	FB	874860	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-061218-33	6/12/2018	FB	875438	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-090918-01	9/9/2018	FB	880601	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-121018-01	12/10/2018	FB	884857	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	**0.280**	--	--	**0.100**	--	--	0.060	UJ	MSD	--	--	--	0.050	U	--
Field Blank	YVD-121118-12	12/11/2018	FB	884939	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	**0.140**	--	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-031719-01	3/17/2019	FB	988239	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	**0.220**	--	--	0.120	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-031819-11	3/18/2019	FB	988273	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-032019-20	3/20/2019	FB	988477	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-060219-01	6/2/2019	FB	991939	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	**11.0**	--	--	**0.630**	--	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-060319-13	6/3/2019	FB	992053	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	**0.310**	--	--	0.100	U	--	0.060	U	--	--	--	--	**0.080**	--	--
Field Blank	YVD-060419-26	6/4/2019	FB	992242	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-090919-01	9/9/2019	FB	998357	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-090919-03	9/9/2019	FB	998357	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-091019-15	9/10/2019	FB	998438	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-091019-17	9/10/2019	FB	998438	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-120919-01	12/9/2019	FB	902276	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-120919-09	12/9/2019	FB	902276	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-121019-16	12/10/2019	FB	902321	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-121019-18	12/10/2019	FB	902321	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-033020-01	3/30/2020	FB	006241	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-033020-03	3/30/2020	FB	006241	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-033120-13	3/31/2020	FB	006260	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-033120-15	3/31/2020	FB	006260	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-060820-01	6/8/2020	FB	009144	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-060820-02	6/8/2020	FB	009144	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-060920-11	6/9/2020	FB	009269	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-060920-13	6/9/2020	FB	009269	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-061020-29	6/10/2020	FB	009361	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-061020-28	6/10/2020	FB	009361	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Alkalinity, Bicarbonate (as CaCO3)			Alkalinity, Total (as CaCO3)			Ammonia (as N)			Ammonia (as N)			Calcium			Chloride			Fluoride			Magnesium			Nitrate + Nitrite (as N)			Nitrate (as N)		
Analytical Method					SM 2320B			SM 2320B			EPA 350.1			SM 4500 NH3--G			EPA 200.7			EPA 300			EPA 300.0			EPA 200.7			EPA 353.2			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
Field Blank	YVD-092020-01	9/20/2020	FB	013864	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-092020-02	9/20/2020	FB	013864	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-092120-10	9/21/2020	FB	013896	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-092120-12	9/21/2020	FB	013896	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-120720-01	12/7/2020	FB	017035	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-120720-03	12/7/2020	FB	017035	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-120820-16	12/8/2020	FB	017137	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-120820-18	12/8/2020	FB	017137	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-030121-01	3/1/2021	FB	119931	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-030121-03	3/1/2021	FB	119931	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-030221-11	3/2/2021	FB	120034	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-030221-13	3/2/2021	FB	120034	NS	--	--	NS	--	--	0.070	U	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--	--	--	--	NS	--	--
Field Blank	YVD-060621-01	6/6/2021	FB	124053	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-060621-02	6/6/2021	FB	124053	--	--	--	--	--	--	0.070	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-060721-11	6/7/2021	FB	124105	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-060721-12	6/7/2021	FB	124105	--	--	--	--	--	--	0.070	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-060821-20	6/8/2021	FB	124212	5.00	U	--	5.00	U	--	0.070	U	--	--	--	--	0.400	U	--	0.100	U	--	0.100	U	--	0.060	U	--	--	--	--	0.050	U	--
Field Blank	YVD-060821-21	6/8/2021	FB	124212	--	--	--	--	--	--	0.070	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-121421-01	12/14/2021	FB	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.100	U	--
Field Blank	YVD-121521-13	12/15/2021	FB	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.100	UJ	ERL
Field Blank	YVD-031422-01	3/14/2022	FB	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.050	UJ	ERL
Field Blank	YVD-031522-09	3/15/2022	FB	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.050	U	--
Field Blank	YVD-060522-01	6/5/2022	FB	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.100	U	--
Field Blank	YVD-060622-13	6/6/2022	FB	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.100	U	--
Field Blank	YVD-060722-23	6/7/2022	FB	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.100	UJ	HTQ
Field Blank	YVD-060822-33	6/8/2022	FB	K2206299	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.250	U	--
Field Blank	YVD-091322-01	9/13/2022	FB	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.100	U	--
Field Blank	YVD-091422-14	9/14/2022	FB	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.100	U	--
Field Blank	YVD-120622-01	12/6/2022	FB	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.100	U	--
Field Blank	YVD-120722-08	12/7/2022	FB	K2214479	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.100	U	--
Field Blank	YVD-120822-12	12/8/2022	FB	K2214578	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.100	U	MBK
Field Blank	YVD-122722-22	12/27/2022	FB	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.100	U	--
Field Blank	YVD-030523-01	3/5/2023	FB	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-030623-07	3/6/2023	FB	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.050	U	--
Field Blank	YVD-061923-01	6/19/2023	FB	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.10	UJ	HTQ
Field Blank	YVD-062023-05	6/20/2023	FB	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.10	UJ	HTQ
Field Blank	YVD-062123-21	6/21/2023	FB	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.10	UJ	HTQ
Field Blank	YVD-091023-02	9/10/2023	FB	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.10	UJ	HTQ
Field Blank	YVD-091123-08	9/11/2023	FB	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.10	UJ	HTQ
Field Blank	YVD-120423-05	12/4/2023	FB	K2313548	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.10	UJ	HTQ
Field Blank	YVD-120623-03	12/6/2023	FB	K2313796	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.10	UJ	HTQ
Blank Check	WW-1	4/25/2016	BC	59032861	**110**	--	--	**110**	--	--	**0.330**	--	--	**0.330**	--	--	1.70	U	--	160	U	--	100	U	--	0.830	U	--	--	--	--	40.0	U	--
Blank Check	DW-1	4/25/2016	BC	59032861	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--
Blank Check	DI-1	4/25/2016	BC	59032861	4.00	U	--	4.00	U	--	0.100	U	--	0.100	U	--	1.00	U	--	0.800	U	--	0.500	U	--	0.500	U	--	--	--	--	0.200	U	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-01	DC-01-130104	01/04/2013	N	EPA01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-01	DC-01-130924	09/24/2013	N	SWI0178	0.200	U	--	0.250	U	--	--	--	--	--	--	--	**0.123**	--	--	--	--	--	**6.10**	--	--	**43.0**	--	--	**223**	--	--
DC-01	DC-01-131211	12/11/2013	N	SWL0063	2.00	U	--	0.200	U	--	--	--	--	--	--	--	--	--	--	**0.186**	--	--	**5.94**	--	--	**41.9**	--	--	**280**	J-	MSD
DC-01	DC-01-140318	03/18/2014	N	SXC0095	2.00	U	--	**0.304**	--	--	**0.079**	--	--	--	--	--	--	--	--	--	--	--	**5.93**	--	--	**40.2**	--	--	**250**	J-	MSD
DC-01	DC-01-140602	06/02/2014	N	SXF0017	0.800	U	--	**0.450**	--	--	**0.810**	--	--	--	--	--	--	--	--	--	--	--	**6.74**	--	--	**41.8**	--	--	**224**	J-	MSD
DC-01	DC-01-140923	09/23/2014	N	SXI0158	2.00	U	--	0.250	U	--	**0.120**	--	--	--	--	--	--	--	--	--	--	--	**6.02**	--	--	**44.3**	J+	MSD	**216**	--	--
DC-01	DC-01-141216	12/16/2014	N	SXL0121	2.00	U	--	0.250	UJ	MSD	0.100	U	--	--	--	--	--	--	--	--	--	--	**6.18**	--	--	**43.1**	--	--	**463**	--	--
DC-01	DC-01-150316	03/16/2015	N	5904471	2.00	U	--	0.250	UJ	MSD	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**6.50**	--	--	**44.0**	--	--	**220**	--	--
DC-01	DC-01-150616	06/16/2015	N	59010751	2.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**6.20**	J+	MSD	**42.0**	J+	MSD	**200**	J-	MSD
DC-01	DC-01-150923	09/23/2015	N	59020281	2.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**6.00**	--	--	**43.0**	--	--	**200**	--	--
DC-01	YVD-D1-150923	09/23/2015	FD	59020281	0.200	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**6.10**	--	--	**43.0**	--	--	**210**	--	--
DC-01	DC-01-151214	12/14/2015	N	59025431	2.00	U	--	--	R	MSD	**0.300**	J	FDP	--	--	--	--	--	--	--	--	--	**6.80**	--	--	**48.0**	--	--	**220**	--	--
DC-01	DC-01-160308	03/08/2016	N	59029711	2.00	U	--	--	R	MSD	**0.260**	--	--	--	--	--	--	--	--	--	--	--	**6.20**	--	--	**42.0**	--	--	**210**	J+	MSD
DC-01	DC-01-160620	6/20/2016	N	59037101	2.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**6.50**	--	--	**46.0**	--	--	**220**	J-	MSD
DC-01	DC-01-160928	9/28/2016	N	K1611629	0.100	U	--	0.500	U	--	--	--	--	**0.009**	J	--	--	--	--	--	--	--	**5.76**	--	--	**41.6**	--	--	**193**	--	--
DC-01	DC-01-161212	12/12/2016	N	K1615045	0.100	UJ	HTQ	0.500	U	--	--	--	--	**0.040**	--	--	--	--	--	--	--	--	**5.52**	--	--	**40.4**	--	--	**191**	--	--
DC-01	YVD-030817-18	3/8/2017	N	K1702324	0.100	U	--	0.500	U	--	--	--	--	**0.008**	J	--	--	--	--	--	--	--	**5.13**	--	--	**37.4**	--	--	**175**	--	--
DC-01	YVD-060417-03	6/4/2017	N	K1705702	0.100	U	--	0.500	U	--	--	--	--	**0.010**	J	--	--	--	--	--	--	--	**5.22**	--	--	**37.4**	--	--	**203**	--	--
DC-01	YVD-060417-05	6/4/2017	FD	K1705702	0.100	U	--	0.500	U	--	--	--	--	**0.010**	J	--	--	--	--	--	--	--	**5.08**	--	--	**36.9**	--	--	**203**	--	--
DC-01	YVD-092517-13	9/25/2017	N	K1710333	0.100	U	--	0.500	U	--	--	--	--	0.010	U	--	--	--	--	--	--	--	**5.31**	--	--	**39.1**	--	--	**194**	--	--
DC-01	YVD-120617-31	12/6/2017	N	K1713157	0.100	U	--	0.500	U	--	--	--	--	**0.010**	--	--	--	--	--	--	--	--	**5.56**	--	--	**40.6**	--	--	**182**	--	--
DC-01	YVD-060418-19	6/4/2018	N	874662	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.80**	--	--	**42.4**	--	--	**171**	--	--
DC-01	YVD-060219-03	6/2/2019	N	991939	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.50**	--	--	**39.0**	--	--	**168**	--	--
DC-01	YVD-060820-07	6/8/2020	N	009144	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	**0.160**	--	--	**5.80**	--	--	**40.7**	--	--	**164**	--	--
DC-01	YVD-060721-10	6/7/2021	N	124105	0.050	U	--	5.00	UJ	MS, RPD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.30**	--	--	**36.4**	--	--	**136**	--	--
DC-01	YVD-060622-15	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-01	YVD-061923-02	6/19/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03	DC-03-130102	01/02/2013	N	EPA01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03	DC-03-130918	09/18/2013	N	SWI0138	2.00	U	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	**2.73**	--	--	**173**	--	--	**176**	--	--
DC-03	DC-03-131212	12/12/2013	N	SWL0078	2.00	U	--	0.200	U	--	--	--	--	--	--	--	--	--	--	**0.221**	--	--	**3.29**	--	--	**172**	--	--	**176**	--	--
DC-03	YVD-D3-131212	12/12/2013	FD	SWL0078	2.00	U	--	0.831	U	ERL	--	--	--	--	--	--	--	--	--	**0.244**	--	--	**3.53**	--	--	**181**	--	--	**160**	--	--
DC-03	DC-03-140319	03/19/2014	N	SXC0107	2.00	U	--	**0.938**	J-	MSD	**0.057**	--	--	--	--	--	--	--	--	--	--	--	**2.91**	--	--	**165**	--	--	**189**	J	FDP
DC-03	YVD-D3-140319	03/19/2014	FD	SXC0107	2.00	U	--	**0.718**	J-	MSD	**0.062**	--	--	--	--	--	--	--	--	--	--	--	**2.81**	--	--	**166**	--	--	**150**	J	FDP
DC-03	DC-03-140604	06/04/2014	N	SXF0025	4.00	U	--	0.250	UJ	MSD	**0.120**	--	--	--	--	--	--	--	--	--	--	--	**3.11**	--	--	**177**	--	--	**214**	--	--
DC-03	DC-03-140924	09/24/2014	N	SXI0173	2.00	U	--	**2.27**	J+	MSD	**0.073**	J+	FBK	--	--	--	--	--	--	--	--	--	**3.28**	--	--	**178**	--	--	**166**	--	--
DC-03	DC-03-141217	12/17/2014	N	SXL0144	4.00	U	--	--	R	MSD	0.100	UJ	MSD	--	--	--	--	--	--	--	--	--	**3.76**	--	--	**185**	--	--	**182**	--	--
DC-03	YVD-D4-141217	12/17/2014	FD	SXL0144	10.0	U	--	--	R	MSD	**0.130**	J-	MSD	--	--	--	--	--	--	--	--	--	**3.19**	--	--	**180**	--	--	**211**	--	--
DC-03	DC-03-150318	03/18/2015	N	5904651	2.00	U	--	**0.450**	J-	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.30**	J-	MSD	**180**	--	--	**160**	--	--
DC-03	YVD-D4-150318	03/18/2015	FD	5904651	1.00	U	--	**0.530**	J-	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.60**	J-	MSD	**180**	--	--	**160**	--	--
DC-03	DC-03-150617	06/17/2015	N	59011021	2.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.60**	J	RPD	**190**	J	RPD	**170**	--	--
DC-03	YVD-D4-150617	06/17/2015	FD	59011021	2.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.60**	J	RPD	**190**	J	RPD	**180**	--	--
DC-03	DC-03-150925	09/25/2015	N	59020431	4.00	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.30**	--	--	**180**	--	--	**150**	--	--
DC-03	YVD-D4-150925	09/25/2015	FD	59020431	4.00	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.20**	--	--	**180**	--	--	**160**	--	--
DC-03	DC-03-151216	12/16/2015	N	59025501	2.00	U	--	--	R	MSD	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**3.50**	--	--	**160**	--	--	**130**	--	--
DC-03	YVD-D4-151216	12/16/2015	FD	59025501	1.00	U	--	--	R	MSD	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**3.50**	--	--	**160**	--	--	**130**	--	--
DC-03	DC-03-160310	03/10/2016	N	59029941	2.00	U	--	**0.940**	J-	FDP, MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.10**	--	--	**180**	--	--	**170**	J	DUP
DC-03	YVD-D4-160310	03/10/2016	FD	59029941	2.00	U	--	0.250	UJ	FDP, MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.00**	--	--	**180**	--	--	**180**	J	DUP
DC-03	DC-03-160623	6/23/2016	N	59037371	2.00	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.50**	--	--	**190**	--	--	**160**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-03	YVD-D4-160623	6/23/2016	FD	59037371	1.00	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.30**	--	--	**180**	--	--	**160**	--	--
DC-03	DC-03-160927	9/27/2016	N	K1611565	0.100	U	--	--	R	MSD	--	--	--	**0.006**	J	--	--	--	--	--	--	--	**2.85**	--	--	**182**	--	--	**139**	--	--
DC-03	DC-03-D2-160927	9/27/2016	FD	K1611565	0.100	U	--	--	R	MSD	--	--	--	0.010	U	--	--	--	--	--	--	--	**2.87**	--	--	**183**	--	--	**138**	--	--
DC-03	DC-03-161212	12/12/2016	N	K1615029	0.100	U	--	0.500	U	--	--	--	--	**0.199**	--	--	--	--	--	--	--	--	**3.05**	--	--	**167**	--	--	**112**	--	--
DC-03	YVD-030817-13	3/8/2017	N	K1702324	**0.120**	--	--	0.500	U	--	--	--	--	**0.006**	J	--	--	--	--	--	--	--	**2.58**	--	--	**159**	--	--	**104**	--	--
DC-03	YVD-060517-02	6/5/2017	N	K1705702	0.100	U	--	0.500	U	--	--	--	--	**0.022**	--	--	--	--	--	--	--	--	**2.49**	--	--	**157**	--	--	**147**	--	--
DC-03	YVD-060517-04	6/5/2017	FD	K1705702	0.100	U	--	0.500	U	--	--	--	--	**0.019**	--	--	--	--	--	--	--	--	**2.49**	--	--	**158**	--	--	**122**	--	--
DC-03	YVD-092617-22	9/26/2017	N	K1710333	0.100	U	--	0.500	U	--	--	--	--	**0.010**	J	--	--	--	--	--	--	--	**2.92**	--	--	**159**	--	--	**115**	--	--
DC-03	YVD-120417-10	12/4/2017	N	K1713026	0.100	U	--	0.500	U	--	--	--	--	0.017	U	MBK	--	--	--	--	--	--	**2.76**	--	--	**161**	--	--	**108**	--	--
DC-03	YVD-031818-04	3/18/2018	N	870610	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.01**	--	--	**180**	--	--	**111**	--	--
DC-03	YVD-060418-22	6/4/2018	N	874860	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.34**	--	--	**174**	--	--	**108**	--	--
DC-03	YVD-090918-17	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.82**	--	--	**160**	--	--	**136**	--	--
DC-03	YVD-121018-03	12/10/2018	N	884857	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.24**	--	--	**170**	--	--	**134**	--	--
DC-03	YVD-031819-19	3/18/2019	N	988273	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.19**	--	--	**178**	--	--	**148**	--	--
DC-03	YVD-060419-32	6/4/2019	N	992242	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.02**	--	--	**172**	--	--	**152**	--	--
DC-03	YVD-091019-23	9/10/2019	N	998438	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.06**	--	--	**159**	--	--	**154**	--	--
DC-03	YVD-121019-22	12/10/2019	N	902321	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.60**	--	--	**164**	--	--	**156**	--	--
DC-03	YVD-033120-22	3/31/2020	N	006260	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.14**	--	--	**168**	--	--	**146**	--	--
DC-03	YVD-060920-26	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS										0.070	U	--	**3.30**	--	--	**174**	--	--	**161**	--	--
DC-03	YVD-092120-21	9/21/2020	N	013896	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.06**	--	--	**160**	--	--	**166**	--	--
DC-03	YVD-120720-05	12/7/2020	N	017035	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.58**	--	--	**170**	--	--	**160**	--	--
DC-03	YVD-120720-07	12/7/2020	FD	017035	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.66**	--	--	**166**	--	--	**161**	--	--
DC-03	YVD-030221-23	3/2/2021	N	120034	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.22**	--	--	**166**	--	--	**154**	--	--
DC-03	YVD-060821-27	6/8/2021	N	124212	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.07**	--	--	**160**	--	--	**162**	--	--
DC-03	YVD-031522-10	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03	YVD-031522-11	3/15/2022	FD	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03	YVD-060522-10	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03	YVD-091322-12	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03	YVD-122722-21	12/27/2022	N	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03	YVD-030623-15	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03	YVD-062023-20	6/20/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03	YVD-091023-06	9/10/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03	YVD-120423-14	12/4/2023	N	K2313657	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03D	DC-03D-130918	09/18/2013	N	SWI0138	2.00	U	--	**0.255**	--	--	--	--	--	--	--	--	0.100	U	--	--	--	--	**2.71**	--	--	**62.1**	--	--	**101**	--	--
DC-03D	DC-03D-131212	12/12/2013	N	SWL0073	2.00	U	--	0.200	UJ	MSD	--	--	--	--	--	--	--	--	--	0.060	U	--	**2.67**	--	--	**59.7**	--	--	**99.1**	--	--
DC-03D	DC-03D-140319	03/19/2014	N	SXC0107	2.00	U	--	**0.427**	J-	MSD	0.050	U	--	--	--	--	--	--	--	--	--	--	**2.67**	--	--	**57.5**	--	--	**106**	--	--
DC-03D	DC-03D-140603	06/03/2014	N	SXF0017	0.800	U	--	**0.468**	--	--	**0.074**	J+	FBK	--	--	--	--	--	--	--	--	--	**2.66**	--	--	**59.0**	--	--	**103**	J-	MSD
DC-03D	DC-03D-140923	09/23/2014	N	SXI0173	1.00	U	--	0.250	U	--	**0.098**	--	--	--	--	--	--	--	--	--	--	--	**3.40**	--	--	**67.8**	--	--	**89.4**	--	--
DC-03D	DC-03D-141217	12/17/2014	N	SXL0121	1.00	U	--	**0.282**	J-	MSD	0.100	U	--	--	--	--	--	--	--	--	--	--	**2.92**	--	--	**60.7**	--	--	**92.2**	--	--
DC-03D	DC-03D-150317	03/17/2015	N	5904651	1.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.00**	J-	MSD	**68.0**	--	--	**87.0**	--	--
DC-03D	DC-03D-150617	06/17/2015	N	59011021	1.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.20**	J	RPD	**68.0**	J	RPD	**93.0**	--	--
DC-03D	DC-03D-150925	09/25/2015	N	59020431	4.00	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.00**	--	--	**65.0**	--	--	**86.0**	--	--
DC-03D	DC-03D-151216	12/16/2015	N	59025501	1.00	U	--	--	R	MSD	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**3.20**	--	--	**69.0**	--	--	**94.0**	--	--
DC-03D	DC-03D-160310	03/10/2016	N	59029941	1.00	U	--	0.250	UJ	FDP, MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.00**	--	--	**68.0**	--	--	**90.0**	J	DUP
DC-03D	DC-03D-160623	6/23/2016	N	59037371	2.00	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.00**	--	--	**70.0**	--	--	**89.0**	--	--
DC-03D	DC-03D-160927	9/27/2016	N	K1611565	0.100	U	--	--	R	MSD	--	--	--	**0.006**	J	--	--	--	--	--	--	--	**2.73**	--	--	**63.0**	--	--	**90.9**	--	--
DC-03D	DC-03D-161212	12/12/2016	N	K1615029	0.100	U	--	0.500	U	--	--	--	--	**0.085**	--	--	--	--	--	--	--	--	**2.98**	--	--	**65.0**	--	--	**90.7**	--	--
DC-03D	YVD-030817-14	3/8/2017	N	K1702324	**0.050**	J	--	0.500	U	--	--	--	--	**0.008**	J	--	--	--	--	--	--	--	**2.75**	--	--	**61.3**	--	--	**80.8**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-03D	YVD-030817-16	3/8/2017	FD	K1702324	**0.040**	J	--	0.500	U	--	--	--	--	**0.008**	J	--	--	--	--	--	--	--	**2.69**	--	--	**60.2**	--	--	**79.6**	--	--
DC-03D	YVD-060517-09	6/5/2017	N	K1705702	0.100	U	--	0.500	U	--	--	--	--	**0.006**	J	--	--	--	--	--	--	--	**2.66**	--	--	**59.7**	--	--	**91.6**	--	--
DC-03D	YVD-092617-24	9/26/2017	N	K1710333	0.100	U	--	--	R	MSD	--	--	--	**0.011**	--	--	--	--	--	--	--	--	**3.16**	--	--	**67.1**	--	--	**101**	--	--
DC-03D	YVD-120417-08	12/4/2017	N	K1713026	0.100	U	--	0.500	U	--	--	--	--	0.011	U	MBK	--	--	--	--	--	--	**2.64**	--	--	**60.9**	--	--	**86.7**	--	--
DC-03D	YVD-031818-02	3/18/2018	N	870610	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.02**	--	--	**70.0**	--	--	**86.1**	--	--
DC-03D	YVD-060418-24	6/4/2018	N	874860	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.24**	--	--	**67.0**	--	--	**82.1**	--	--
DC-03D	YVD-090918-15	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.01**	--	--	**68.0**	--	--	**88.6**	--	--
DC-03D	YVD-121018-05	12/10/2018	N	884857	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.18**	--	--	**67.0**	--	--	**83.0**	--	--
DC-03D	YVD-031819-17	3/18/2019	N	988273	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.16**	--	--	**66.5**	--	--	**82.0**	--	--
DC-03D	YVD-060419-30	6/4/2019	N	992242	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.94**	--	--	**65.5**	--	--	**81.8**	--	--
DC-03D	YVD-060419-31	6/4/2019	FD	992242	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.96**	--	--	**66.0**	--	--	**82.6**	--	--
DC-03D	YVD-091019-21	9/10/2019	N	998438	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.99**	--	--	**65.0**	--	--	**81.7**	--	--
DC-03D	YVD-091019-22	9/10/2019	FD	998438	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.98**	--	--	**65.0**	--	--	**81.7**	--	--
DC-03D	YVD-121019-20	12/10/2019	N	902321	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.18**	--	--	**61.5**	--	--	**80.9**	--	--
DC-03D	YVD-033120-20	3/31/2020	N	006260	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.92**	--	--	**64.0**	--	--	**74.5**	--	--
DC-03D	YVD-061020-34	6/10/2020	N	009361	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.85**	--	--	**62.5**	--	--	**75.0**	--	--
DC-03D	YVD-092120-19	9/21/2020	N	013896	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.96**	--	--	**65.0**	--	--	**82.4**	--	--
DC-03D	YVD-120720-09	12/7/2020	N	017035	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.31**	--	--	**63.5**	--	--	**77.0**	--	--
DC-03D	YVD-030221-21	3/2/2021	N	120034	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.96**	--	--	**63.5**	--	--	**80.6**	--	--
DC-03D	YVD-030221-21	3/2/2021	N	120034	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.96**	--	--	**63.5**	--	--	**80.6**	--	--
DC-03D	YVD-060821-29	6/8/2021	N	124212	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.04**	--	--	**63.5**	--	--	**83.7**	--	--
DC-03D	YVD-060821-31	6/8/2021	FD	124212	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.98**	--	--	**62.5**	--	--	**81.0**	--	--
DC-03D	YVD-121421-10	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03D	YVD-031422-08	3/14/2022	N	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03D	YVD-060522-11	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03D	YVD-060522-11	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03D	YVD-091322-10	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03D	YVD-122722-20	12/27/2022	N	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03D	YVD-030623-14	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03D	YVD-062023-17	6/20/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03D	YVD-062023-18	6/20/2023	FD	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03D	YVD-091023-04	9/10/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-03D	YVD-120423-12	12/4/2023	N	K2313657	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-04	DC-04-130103	01/03/2013	N	EPA01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-04	DC-04-130920	09/20/2013	N	SWI0142	--	--	--	**3.03**	--	--	--	--	--	--	--	--	0.100	U	--	--	--	--	**3.45**	--	--	**32.1**	--	--	**93.6**	--	--
DC-04	DC-04-130924	09/24/2013	N	SWI0175	2.00	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-04	DC-04-131212	12/12/2013	N	SWL0073	2.00	U	--	0.200	UJ	MSD	--	--	--	--	--	--	--	--	--	**0.104**	--	--	**3.51**	--	--	**31.7**	--	--	**110**	--	--
DC-04	DC-04-140318	03/18/2014	N	SXC0107	2.00	U	--	**0.707**	J-	MSD	**0.130**	--	--	--	--	--	--	--	--	--	--	--	**3.58**	--	--	**30.4**	--	--	**107**	--	--
DC-04	DC-04-140603	06/03/2014	N	SXF0017	0.800	U	--	**0.645**	--	--	**0.240**	J+	FBK	--	--	--	--	--	--	--	--	--	**3.65**	--	--	**32.3**	--	--	**104**	J-	MSD
DC-04	DC-04-140923	09/23/2014	N	SXI0173	1.00	U	--	**0.524**	J+	MSD	**0.290**	--	--	--	--	--	--	--	--	--	--	--	**4.51**	--	--	**35.5**	--	--	**108**	--	--
DC-04	DC-04-141217	12/17/2014	N	SXL0121	1.00	U	--	0.250	UJ	MSD	**0.170**	--	--	--	--	--	--	--	--	--	--	--	**4.34**	--	--	**34.9**	--	--	**120**	--	--
DC-04	DC-04-150317	03/17/2015	N	5904651	1.00	U	--	**0.330**	J-	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.90**	J-	MSD	**36.0**	--	--	**110**	--	--
DC-04	DC-04-150617	06/17/2015	N	59010961	2.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.10**	J+	MSD	**36.0**	J+	MSD	**110**	--	--
DC-04	DC-04-150924	09/24/2015	N	59020391	1.00	U	--	**0.250**	J-	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.90**	--	--	**33.0**	--	--	**140**	J-	MSD
DC-04	YVD-D3-150924	09/24/2015	FD	59020391	1.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.10**	--	--	**35.0**	--	--	**150**	J-	MSD
DC-04	DC-04-151215	12/15/2015	N	59025431	1.00	U	--	--	R	MSD	0.250	UJ	FDP	--	--	--	--	--	--	--	--	--	**4.20**	--	--	**36.0**	--	--	**130**	--	--
DC-04	DC-04-160309	03/09/2016	N	59029711	1.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.00**	--	--	**36.0**	--	--	**150**	J+	MSD
DC-04	DC-04-160621	6/21/2016	N	59037271	1.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.40**	--	--	**39.0**	--	--	**150**	--	--
DC-04	DC-04-160926	9/26/2016	N	K1611506	0.100	U	--	--	R	MSD	--	--	--	**0.137**	--	--	--	--	--	--	--	--	**4.50**	--	--	**38.2**	--	--	**142**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-04	DC-04-161216	12/12/2016	N	K1615174	0.100	U	--	0.500	U	--	--	--	--	**0.052**	--	--	--	--	--	--	--	--	**4.11**	--	--	**36.9**	--	--	**155**	--	--
DC-04	YVD-031017-31	3/10/2017	N	K1702448	0.100	U	--	0.500	U	--	--	--	--	**0.035**	J	FDP	--	--	--	--	--	--	**3.75**	--	--	**32.4**	--	--	**153**	--	--
DC-04	YVD-031017-33	3/10/2017	FD	K1702448	0.100	U	--	0.500	U	--	--	--	--	**0.053**	J	FDP	--	--	--	--	--	--	**3.74**	--	--	**32.3**	--	--	**152**	--	--
DC-04	YVD-060617-26	6/6/2017	N	K1705833	0.100	U	--	0.500	U	--	--	--	--	**0.085**	--	--	--	--	--	--	--	--	**3.96**	--	--	**34.7**	--	--	**129**	--	--
DC-04	YVD-092517-06	9/25/2017	N	K1710274	0.100	U	--	0.500	U	--	--	--	--	**0.044**	--	--	--	--	--	--	--	--	**4.06**	--	--	**35.9**	--	--	**140**	--	--
DC-04	YVD-120517-24	12/5/2017	N	K1713091	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.037**	--	--	--	--	--	--	--	--	**3.62**	--	--	**32.7**	--	--	**121**	--	--
DC-04	YVD-031818-07	3/18/2018	N	870610	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.02**	--	--	**35.6**	--	--	**115**	--	--
DC-04	YVD-060418-18	6/4/2018	N	874662	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.18**	--	--	**34.4**	--	--	**119**	--	--
DC-04	YVD-090918-18	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.98**	--	--	**32.8**	--	--	**109**	--	--
DC-04	YVD-121118-18	12/11/2018	N	884939	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.08**	--	--	**32.0**	--	--	**102**	--	--
DC-04	YVD-032019-21	3/20/2019	N	988477	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.93**	--	--	**32.2**	--	--	**100**	--	--
DC-04	YVD-060219-14	6/2/2019	N	991939	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.00**	--	--	**32.2**	--	--	**103**	--	--
DC-04	YVD-090919-09	9/9/2019	N	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.98**	--	--	**31.6**	--	--	**102**	--	--
DC-04	YVD-120919-07	12/9/2019	N	902276	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.20**	--	--	**32.2**	J	MSD	**101**	--	--
DC-04	YVD-033120-18	3/31/2020	N	006260	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.04**	--	--	**32.8**	--	--	**101**	--	--
DC-04	YVD-060820-08	6/8/2020	N	009144	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	**0.070**	--	--	**4.14**	--	--	**33.8**	--	--	**102**	--	--
DC-04	YVD-092020-07	9/20/2020	N	013864	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.22**	--	--	**34.6**	--	--	**108**	--	--
DC-04	YVD-120820-23	12/8/2020	N	017137	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.32**	--	--	**35.2**	--	--	**121**	--	--
DC-04	YVD-030221-20	3/2/2021	N	120034	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.40**	--	--	**34.7**	--	--	**112**	--	--
DC-04	YVD-030221-22	3/2/2021	FD	120034	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.22**	--	--	**34.3**	--	--	**111**	--	--
DC-04	YVD-030221-20	3/2/2021	N	120034	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.40**	--	--	**34.7**	--	--	**112**	--	--
DC-04	YVD-030221-22	3/2/2021	FD	120034	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.22**	--	--	**34.3**	--	--	**111**	--	--
DC-04	YVD-060621-06	6/6/2021	N	124053	0.050	U	--	5.00	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.22**	--	--	**33.2**	--	--	**109**	--	--
DC-04	YVD-121521-21	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-04	YVD-031522-15	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-04	YVD-060522-05	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-04	YVD-091322-06	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-04	YVD-120722-09	12/7/2022	N	K2214479	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-04	YVD-120722-10	12/7/2022	FD	K2214479	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-04	YVD-030623-17	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-04	YVD-030623-18	3/6/2023	FD	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-04	YVD-062023-11	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-04	YVD-091123-22	9/11/2023	N	K2310209	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-04	YVD-120423-08	12/4/2023	N	K2313548	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05	DC-05-130104	01/04/2013	N	EPA01	--		--	--		--	--	--	--	--	--	--	--	--	--	--	--	--	--		--	--		--	--		--
DC-05	DC-05-130920	09/20/2013	N	SWI0142	--		--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	**2.88**		--	**64.2**		--	**154**		--
DC-05	DC-05-130924	09/24/2013	N	SWI0175	2.00	U	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--	--		--	--		--	--		--
DC-05	DC-05-131212	12/12/2013	N	SWL0073	2.00	U	--	0.200	UJ	MSD	--	--	--	--	--	--	--	--	--	**0.723**	--	--	**3.92**	--	--	**64.2**	--	--	**178**	--	--
DC-05	DC-05-140318	03/18/2014	N	SXC0107	2.00	U	--	**0.558**	J-	MSD	**0.060**	--	--	--	--	--	--	--	--	--	--	--	**2.90**	--	--	**59.4**	--	--	**150**	--	--
DC-05	DC-05-140603	06/03/2014	N	SXF0017	0.800	U	--	**0.581**	--	--	**0.280**	J+	FBK	--	--	--	--	--	--	--	--	--	**3.25**	--	--	**61.3**	--	--	**128**	J-	MSD
DC-05	DC-05-140923	09/23/2014	N	SXI0173	1.00	U	--	**1.00**	J+	MSD	**0.160**	--	--	--	--	--	--	--	--	--	--	--	**3.86**	--	--	**71.0**	--	--	**122**	--	--
DC-05	DC-05-141217	12/17/2014	N	SXL0121	1.00	U	--	0.250	UJ	MSD	**0.130**	--	--	--	--	--	--	--	--	--	--	--	**3.41**	--	--	**59.0**	--	--	**141**	--	--
DC-05	DC-05-150317	03/17/2015	N	5904541	0.800	U	--	**0.270**	J-	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.00**	--	--	**61.0**	--	--	**140**	J-	MSD
DC-05	DC-05-150616	06/16/2015	N	59010961	0.800	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.00**	J+	MSD	**64.0**	J+	MSD	**120**	--	--
DC-05	YVD-D2-150616	06/16/2015	FD	59010961	2.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.30**	J+	MSD	**64.0**	J+	MSD	**110**	--	--
DC-05	DC-05-150923	09/23/2015	N	59020391	0.800	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.10**	--	--	**56.0**	--	--	**110**	J-	MSD
DC-05	DC-05-151215	12/15/2015	N	59025431	0.800	U	--	--	R	MSD	0.250	UJ	FDP	--	--	--	--	--	--	--	--	--	**2.90**	--	--	**51.0**	--	--	**120**	--	--
DC-05	DC-05-160309	03/09/2016	N	59029711	0.800	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.90**	--	--	**53.0**	--	--	**140**	J+	MSD
DC-05	DC-05-160621	6/21/2016	N	59037151	0.800	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.80**	--	--	**53.0**	--	--	**130**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-05	DC-05-160926	9/26/2016	N	K1611506	0.100	U	--	--	R	MSD	--	--	--	**0.031**	--	--	--	--	--	--	--	--	**2.89**	--	--	**54.9**	--	--	**114**	--	--
DC-05	DC-05-D1-160926	9/26/2016	FD	K1611506	0.100	U	--	--	R	MSD	--	--	--	**0.028**	--	--	--	--	--	--	--	--	**3.06**	--	--	**58.1**	--	--	**114**	--	--
DC-05	DC-05-161216	12/16/2016	N	K1615174	0.100	U	--	0.500	U	--	--	--	--	**0.048**	--	--	--	--	--	--	--	--	**2.60**	--	--	**47.9**	--	--	**108**	--	--
DC-05	YVD-D5-161216	12/16/2016	FD	K1615174	0.100	U	--	0.500	U	--	--	--	--	**0.04**	--	--	--	--	--	--	--	--	**2.65**	--	--	**49.6**	--	--	**107**	--	--
DC-05	YVD-030717-09	3/7/2017	N	K1702324	0.100	U	--	0.500	U	--	--	--	--	**0.026**	--	--	--	--	--	--	--	--	**2.61**	--	--	**58.3**	--	--	**97.6**	--	--
DC-05	YVD-060717-30	6/7/2017	N	K1705833	0.100	U	--	0.500	U	--	--	--	--	**0.059**	J	FDP	--	--	--	--	--	--	**2.82**	--	--	**63.9**	--	--	**102**	--	--
DC-05	YVD-060717-32	6/7/2017	FD	K1705833	0.100	U	--	0.500	U	--	--	--	--	**0.031**	J	FDP	--	--	--	--	--	--	**2.77**	--	--	**62.6**	--	--	**102**	--	--
DC-05	YVD-092517-04	9/25/2017	N	K1710274	0.100	U	--	0.500	U	--	--	--	--	**0.039**	--	--	--	--	--	--	--	--	**2.99**	--	--	**62.0**	--	--	**107**	--	--
DC-05	YVD-120517-16	12/5/2017	N	K1713091	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.014**	--	--	--	--	--	--	--	--	**2.52**	--	--	**59.1**	--	--	**88.8**	--	--
DC-05	YVD-120517-18	12/5/2017	FD	K1713091	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.014**	--	--	--	--	--	--	--	--	**2.53**	--	--	**60.0**	--	--	**89.3**	--	--
DC-05	YVD-031818-03	3/18/2018	N	870610	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.94**	--	--	**75.0**	--	--	**97.4**	--	--
DC-05	YVD-031818-05	3/18/2018	FD	870610	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.94**	--	--	**75.0**	--	--	**96.7**	--	--
DC-05	YVD-060318-02	6/3/2018	FD	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.02**	--	--	**72.0**	--	--	**88.3**	--	--
DC-05	YVD-090918-03	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.91**	--	--	**65.5**	--	--	**95.4**	--	--
DC-05	YVD-121118-16	12/11/2018	N	884939	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.05**	--	--	**68.1**	--	--	**92.2**	--	--
DC-05	YVD-031719-02	3/17/2019	N	988239	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.10**	--	--	**68.5**	--	--	**117**	--	--
DC-05	YVD-060219-08	6/2/2019	N	991939	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.14**	--	--	**71.0**	--	--	**122**	--	--
DC-05	YVD-090919-14	9/9/2019	N	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.02**	--	--	**65.5**	--	--	**129**	--	--
DC-05	YVD-120919-03	12/9/2019	N	902276	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.12**	--	--	**72.5**	J	MSD	**110**	--	--
DC-05	YVD-033020-12	3/30/2020	N	006241	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.20**	--	--	**76.0**	--	--	**142**	--	--
DC-05	YVD-060820-06	6/8/2020	N	009144	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.26**	--	--	**76.0**	--	--	**114**	--	--
DC-05	YVD-092020-03	9/20/2020	N	013864	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.18**	--	--	**72.0**	--	--	**149**	--	--
DC-05	YVD-120720-06	12/7/2020	N	017035	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.42**	--	--	**65.0**	--	--	**166**	--	--
DC-05	YVD-030221-16	3/2/2021	N	120034	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.24**	--	--	**60.0**	--	--	**143**	--	--
DC-05	YVD-060721-14	6/7/2021	N	124105	0.050	U	--	5.00	UJ	MS, RPD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.26**	--	--	**52.0**	--	--	**102**	--	--
DC-05	YVD-121521-15	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05	YVD-031422-04	3/14/2022	N	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05	YVD-060522-02	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05	YVD-060522-03	6/5/2022	FD	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05	YVD-091322-02	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05	YVD-091322-04	9/13/2022	FD	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05	YVD-120622-02	12/6/2022	N	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05	YVD-120622-03	12/6/2022	FD	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05	YVD-030623-20	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05	YVD-062023-08	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05	YVD-091123-16	9/11/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05	YVD-120423-04	12/4/2023	N	K2313548	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05	YVD-120423-06	12/4/2023	FD	K2313548	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05D	DC-05D-130920	09/20/2013	N	SWI0142	--	--	--	**0.361**	--	--	--	--	--	--	--	--	**0.163**	--	--	--	--	--	**3.67**	--	--	**40.5**	--	--	**167**	--	--
DC-05D	DC-05D-130924	09/24/2013	N	SWI0178	0.200	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05D	DC-05D-131211	12/11/2013	N	SWL0073	2.00	U	--	0.200	UJ	MSD	--	--	--	--	--	--	--	--	--	0.060	U	--	**3.52**	--	--	**37.5**	--	--	**145**	--	--
DC-05D	DC-05D-140318	03/18/2014	N	SXC0095	2.00	U	--	0.250	U	--	**0.072**	--	--	--	--	--	--	--	--	--	--	--	**3.73**	--	--	**36.7**	--	--	**137**	J-	MSD
DC-05D	DC-05D-140602	06/02/2014	N	SXF0017	0.800	U	--	**0.591**	--	--	**0.560**	J+	FBK	--	--	--	--	--	--	--	--	--	**4.99**	--	--	**34.3**	--	--	**122**	J-	MSD
DC-05D	DC-05D-140922	09/22/2014	N	SXI0148	0.800	U	--	**0.424**	--	--	**0.057**	--	--	--	--	--	--	--	--	--	--	--	**3.56**	--	--	**37.8**	--	--	**127**	--	--
DC-05D	DC-05D-141216	12/16/2014	N	SXL0121	0.200	U	--	0.250	UJ	MSD	**0.390**	--	--	--	--	--	--	--	--	--	--	--	**5.18**	--	--	**36.8**	--	--	**140**	--	--
DC-05D	DC-05D-150317	03/17/2015	N	5904541	0.800	U	--	0.250	UJ	MSD	**0.300**	--	--	--	--	--	--	--	--	--	--	--	**4.60**	--	--	**39.0**	--	--	**120**	J-	MSD
DC-05D	DC-05D-150616	06/16/2015	N	59010961	0.800	U	--	0.250	UJ	MSD	**0.270**	--	--	--	--	--	--	--	--	--	--	--	**4.70**	J+	MSD	**41.0**	J+	MSD	**120**	--	--
DC-05D	DC-05D-150923	09/23/2015	N	59020391	0.800	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.40**	--	--	**38.0**	--	--	**120**	J-	MSD

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-05D	YVD-D2-150923	09/23/2015	FD	59020391	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.40**	--	--	**38.0**	--	--	**120**	J-	MSD
DC-05D	DC-05D-151215	12/15/2015	N	59025431	0.800	U	--	--	R	MSD	0.250	UJ	FDP	--	--	--	--	--	--	--	--	--	**4.40**	--	--	**39.0**	--	--	**120**	--	--
DC-05D	DC-05D-160309	03/09/2016	N	59029711	0.800	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.30**	--	--	**41.0**	--	--	**140**	J+	MSD
DC-05D	DC-05D-160621	6/21/2016	N	59037271	0.800	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.10**	--	--	**41.0**	--	--	**130**	--	--
DC-05D	DC-05D-160926	9/26/2016	N	K1611506	0.100	U	--	--	R	MSD	--	--	--	**0.014**	--	--	--	--	--	--	--	--	**3.93**	--	--	**39.4**	J	MSD	**113**	--	--
DC-05D	DC-05D-161214	12/14/2016	N	K1615126	0.100	U	--	0.500	U	--	--	--	--	**0.015**	--	--	--	--	--	--	--	--	**3.90**	--	--	**38.2**	--	--	**114**	--	--
DC-05D	YVD-030717-12	3/7/2017	N	K1702324	0.100	U	--	0.500	U	--	--	--	--	**0.041**	--	--	--	--	--	--	--	--	**3.64**	--	--	**35.6**	--	--	**105**	--	--
DC-05D	YVD-060717-34	6/7/2017	N	K1705833	0.100	U	--	0.500	U	--	--	--	--	**0.012**	--	--	--	--	--	--	--	--	**3.78**	--	--	**37.4**	--	--	**101**	--	--
DC-05D	YVD-092517-02	9/25/2017	N	K1710274	0.100	U	--	0.500	U	--	--	--	--	**0.024**	J	FDP	--	--	--	--	--	--	**3.91**	--	--	**38.7**	--	--	**118**	--	--
DC-05D	YVD-092517-03	9/25/2017	FD	K1710274	0.100	U	--	0.500	U	--	--	--	--	**0.008**	J	FDP	--	--	--	--	--	--	**4.02**	--	--	**38.9**	--	--	**115**	--	--
DC-05D	YVD-120517-20	12/5/2017	N	K1713091	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.013**	--	--	--	--	--	--	--	--	**3.69**	--	--	**37.6**	--	--	**112**	--	--
DC-05D	YVD-031818-08	3/18/2018	N	870610	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.97**	--	--	**41.2**	--	--	**108**	--	--
DC-05D	YVD-060318-03	6/3/2018	N	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.12**	--	--	**39.6**	--	--	**105**	--	--
DC-05D	YVD-060318-05	6/3/2018	FD	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.14**	--	--	**39.6**	--	--	**105**	--	--
DC-05D	YVD-090918-02	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.00**	--	--	**38.0**	--	--	**107**	--	--
DC-05D	YVD-121118-14	12/11/2018	N	884939	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.15**	--	--	**38.0**	--	--	**102**	--	--
DC-05D	YVD-031719-04	3/17/2019	N	988239	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.06**	--	--	**38.2**	--	--	**110**	--	--
DC-05D	YVD-031719-06	3/17/2019	FD	988239	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.11**	--	--	**38.6**	--	--	**109**	--	--
DC-05D	YVD-060219-10	6/2/2019	N	991939	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.00**	--	--	**37.8**	--	--	**109**	--	--
DC-05D	YVD-090919-12	9/9/2019	N	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.96**	--	--	**35.4**	--	--	**105**	--	--
DC-05D	YVD-120919-05	12/9/2019	N	902276	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.97**	--	--	**36.6**	J	MSD	**105**	--	--
DC-05D	YVD-033020-14	3/30/2020	N	006241	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.01**	--	--	**37.6**	--	--	**107**	--	--
DC-05D	YVD-060820-02	6/8/2020	N	009144	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.03**	--	--	**38.6**	--	--	**118**	--	--
DC-05D	YVD-060820-04	6/8/2020	FD	009144	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.06**	--	--	**38.7**	--	--	**102**	--	--
DC-05D	YVD-092020-04	9/20/2020	N	013864/20I0421	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.02**	--	--	**38.0**	--	--	**107**	--	--
DC-05D	YVD-092020-05	9/20/2020	FD	013864/20I0421	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.03**	--	--	**37.8**	--	--	**106**	--	--
DC-05D	YVD-120720-02	12/7/2020	N	017035	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.30**	--	--	**38.4**	--	--	**108**	--	--
DC-05D	YVD-120720-04	12/7/2020	FD	017035	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.26**	--	--	**38.2**	--	--	**108**	--	--
DC-05D	YVD-030221-18	3/2/2021	N	120034	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.07**	--	--	**37.8**	--	--	**107**	--	--
DC-05D	YVD-060721-13	6/7/2021	N	124105	0.050	U	--	5.00	UJ	MS, RPD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.11**	--	--	**36.9**	--	--	**106**	--	--
DC-05D	YVD-121421-04	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05D	YVD-031422-02	3/14/2022	N	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05D	YVD-031422-03	3/14/2022	FD	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05D	YVD-060522-04	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05D	YVD-091322-03	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05D	YVD-120622-04	12/6/2022	N	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05D	YVD-030623-22	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05D	YVD-062023-10	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05D	YVD-091123-18	9/11/2023	N	K2310209	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-05D	YVD-120423-02	12/4/2023	N	K2313548	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-07	DC-07-130103	01/03/2013	N	EPA01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-07	DC-07-130918	09/18/2013	N	SWI0123	2.00	U	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	1.00	U	--	**45.7**	--	--	**168**	--	--
DC-07	YVD-D1-130918	09/18/2013	FD	SWI0123	2.00	U	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	1.00	U	--	**46.1**	--	--	**179**	--	--
DC-07	DC-07-131210	12/10/2013	N	SWL0055	2.00	U	--	0.437	UJ	ERL, MSD	--	--	--	--	--	--	--	--	--	**0.065**	--	--	**3.82**	--	--	**38.4**	--	--	**117**	--	--
DC-07	DC-07-140316	03/16/2014	N	SXC0081	0.800	U	--	0.250	U	--	**0.110**	--	--	--	--	--	--	--	--	--	--	--	**1.04**	--	--	**33.5**	--	--	**78.9**	--	--
DC-07	DC-07-140602	06/02/2014	N	SXF0008	0.800	U	--	**0.340**	--	--	**0.120**	--	--	--	--	--	--	--	--	--	--	--	1.00	U	--	**36.3**	--	--	**105**	--	--
DC-07	DC-07-140922	09/22/2014	N	SXI0148	0.800	U	--	**0.487**	--	--	**0.190**	--	--	--	--	--	--	--	--	--	--	--	1.00	U	--	**33.7**	--	--	**98.2**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-07	DC-07-141216	12/16/2014	N	SXL0108	0.800	U	--	**0.261**	--	--	0.100	U	--	--	--	--	--	--	--	--	--	--	1.00	U	--	**30.6**	--	--	**80.4**	--	--
DC-07	YVD-D2-141216	12/16/2014	FD	SXL0108	0.200	U	--	**0.305**	--	--	0.100	U	--	--	--	--	--	--	--	--	--	--	1.00	U	--	**30.8**	--	--	**82.1**	--	--
DC-07	DC-07-150317	03/17/2015	N	5904541	0.800	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**1.00**	--	--	**35.0**	--	--	**83.0**	J-	MSD
DC-07	DC-07-150617	06/17/2015	N	59011021	0.800	U	--	**0.280**	J-	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	1.00	U	--	**37.0**	J	RPD	**93.0**	--	--
DC-07	DC-07-150924	09/24/2015	N	59020391	0.800	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	1.00	U	--	**33.0**	--	--	**95.0**	J-	MSD
DC-07	DC-07-151215	12/15/2015	N	59025501	0.800	U	--	--	R	MSD	**0.410**	J-	MSD	--	--	--	--	--	--	--	--	--	1.00	U	--	**34.0**	--	--	**70.0**	--	--
DC-07	DC-07-160309	03/09/2016	N	59029941	0.800	U	--	--	R	FBK, FDP, MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**1.10**	--	--	**36.0**	--	--	**78.0**	J	DUP
DC-07	DC-07-160621	6/21/2016	N	59037271	0.800	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**1.20**	--	--	**38.0**	--	--	**96.0**	--	--
DC-07	DC-07-160926	9/26/2016	N	K1611565	0.100	U	--	--	R	MSD	--	--	--	**0.057**	--	--	--	--	--	--	--	--	**1.06**	--	--	**36.6**	--	--	**92.3**	--	--
DC-07	DC-07-161214	12/14/2016	N	K1615083	0.100	U	--	0.500	U	--	--	--	--	**0.078**	--	--	--	--	--	--	--	--	**1.05**	--	--	**32.0**	--	--	**72.4**	--	--
DC-07	YVD-030917-25	3/9/2017	N	K1702448	0.100	U	--	0.500	U	--	--	--	--	**0.093**	--	--	--	--	--	--	--	--	**1.03**	--	--	**32.1**	--	--	**59.8**	--	--
DC-07	YVD-060617-18	6/6/2017	N	K1705754	0.100	U	--	0.500	U	--	--	--	--	**0.061**	--	--	--	--	--	--	--	--	**1.10**	--	--	**34.6**	--	--	**70.4**	--	--
DC-07	YVD-092517-12	9/25/2017	N	K1710333	0.100	U	--	0.500	U	--	--	--	--	**0.058**	--	--	--	--	--	--	--	--	**1.14**	--	--	**34.5**	--	--	**94.2**	--	--
DC-07	YVD-120417-14	12/4/2017	N	K1713026	0.100	U	--	0.500	U	--	--	--	--	**0.064**	--	--	--	--	--	--	--	--	**1.17**	--	--	**33.0**	--	--	**81.9**	--	--
DC-07	YVD-060318-17	6/3/2018	N	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**1.52**	--	--	**37.8**	--	--	**93.4**	--	--
DC-07	YVD-060319-20	6/3/2019	N	992053	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**0.820**	--	--	**44.0**	--	--	**49.5**	--	--
DC-07	YVD-060920-18	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**0.980**	--	--	**59.5**	--	--	**110**	--	--
DC-07	YVD-092120-22	9/21/2020	N	013896	0.050	U	--	2.50	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**1.02**	--	--	**62.0**	--	--	**77.1**	--	--
DC-07	YVD-120820-22	12/8/2020	N	017137	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**1.06**	--	--	**54.5**	--	--	**59.8**	--	--
DC-07	YVD-030121-10	3/1/2021	N	119931	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**1.02**	--	--	**50.5**	--	--	**73.2**	--	--
DC-07	YVD-060721-16	6/7/2021	N	124105	0.050	U	--	5.00	UJ	MS, RPD	--	--	--	--	--	--	--	--	--	0.070	U	--	**0.960**	--	--	**48.4**	--	--	**23.1**	J	FDP
DC-07	YVD-060721-17	6/7/2021	FD	124105	0.050	U	--	5.00	UJ	MS, RPD	--	--	--	--	--	--	--	--	--	0.070	U	--	**0.970**	--	--	**48.1**	--	--	**37.8**	J	FDP
DC-07	YVD-121521-17	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-07	YVD-031522-13	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-07	YVD-060522-08	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-07	YVD-091422-16	9/14/2022	N	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-07	YVD-091422-17	9/14/2022	FD	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-07	YVD-122722-23	12/27/2022	N	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-07	YVD-030623-12	3/6/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-07	YVD-062123-27	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-07	YVD-091123-14	9/11/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-07	YVD-120423-10	12/4/2023	N	K2313548	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-09	DC-09-130103	01/03/2013	N	EPA01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-09	DC-09-130923	09/23/2013	N	SWI0178	--	--	--	**0.447**	--	--	--	--	--	--	--	--	0.100	U	--	--	--	--	**2.75**	--	--	**39.7**	--	--	--	--	--
DC-09	DC-09-130926	09/26/2013	N	SWI0190	0.200	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**30.7**	--	--
DC-09	DC-09-131211	12/11/2013	N	SWL0063	0.200	U	--	0.200	U	--	--	--	--	--	--	--	--	--	--	**0.125**	--	--	**2.48**	--	--	**39.1**	--	--	**34.4**	J-	MSD
DC-09	DC-09-140317	03/17/2014	N	SXC0095	0.200	U	--	**0.251**	--	--	**0.180**	--	--	--	--	--	--	--	--	--	--	--	**2.88**	--	--	**36.5**	--	--	**28.8**	J-	MSD
DC-09	DC-09-140602	06/02/2014	N	SXF0008	0.200	U	--	**0.279**	--	--	**0.220**	J	FDP	--	--	--	--	--	--	--	--	--	**2.92**	--	--	**38.1**	--	--	**29.4**	--	--
DC-09	YVD-D3-140602	06/02/2014	FD	SXF0008	0.200	U	--	**0.359**	--	--	**0.160**	J	FDP	--	--	--	--	--	--	--	--	--	**3.08**	--	--	**37.9**	--	--	**29.1**	--	--
DC-09	DC-09-140923	09/23/2014	N	SXI0158	0.200	U	--	0.250	U	--	0.050	U	--	--	--	--	--	--	--	--	--	--	**1.94**	--	--	**38.9**	J+	MSD	**29.6**	--	--
DC-09	DC-09-141216	12/16/2014	N	SXL0108	0.200	U	--	0.250	U	--	**0.130**	--	--	--	--	--	--	--	--	--	--	--	**2.48**	--	--	**39.1**	--	--	**30.2**	--	--
DC-09	DC-09-150316	03/16/2015	N	5904541	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.60**	--	--	**43.0**	--	--	**29.0**	J-	MSD
DC-09	DC-09-150616	06/16/2015	N	59010751	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.30**	J+	MSD	**38.0**	J+	MSD	**28.0**	J-	MSD
DC-09	DC-09-150923	09/23/2015	N	59020281	0.200	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.50**	--	--	**40.0**	--	--	**30.0**	--	--
DC-09	DC-09-151214	12/14/2015	N	59025431	0.200	U	--	--	R	MSD	**0.300**	J	FDP	--	--	--	--	--	--	--	--	--	**2.70**	--	--	**40.0**	--	--	**31.0**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-09	DC-09-160308	03/08/2016	N	59029711	0.200	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.30**	--	--	**39.0**	--	--	**31.0**	J+	MSD
DC-09	YVD-D2-160308	03/08/2016	FD	59029711	0.200	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.10**	--	--	**39.0**	--	--	**31.0**	J+	MSD
DC-09	DC-09-160621	6/21/2016	N	59037151	0.200	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.20**	--	--	**41.0**	--	--	**32.0**	--	--
DC-09	DC-09-160929	9/29/2016	N	K1611704	0.100	U	--	0.500	U	--	--	--	--	**0.016**	--	--	--	--	--	--	--	--	**2.00**	--	--	**39.3**	--	--	**29.8**	--	--
DC-09	DC-09-D4-160929	9/29/2016	FD	K1611704	0.100	U	--	0.500	U	--	--	--	--	**0.013**	--	--	--	--	--	--	--	--	**1.98**	--	--	**38.8**	--	--	**29.6**	--	--
DC-09	DC-09-161215	12/15/2016	N	K1615126	0.100	U	--	0.500	U	--	--	--	--	**0.009**	J	--	--	--	--	--	--	--	**1.99**	--	--	**38.9**	--	--	**30.6**	--	--
DC-09	YVD-D4-161215	12/15/2016	FD	K1615126	0.100	U	--	0.500	U	--	--	--	--	**0.007**	J	--	--	--	--	--	--	--	**1.98**	--	--	**37.8**	--	--	**30.6**	--	--
DC-09	YVD-031317-36	3/13/2017	N	K1702489	0.100	U	--	0.500	U	--	--	--	--	**0.024**	--	--	--	--	--	--	--	--	**2.00**	--	--	**38.8**	--	--	**28.2**	--	--
DC-09	YVD-060717-27	6/7/2017	N	K1705833	0.100	U	--	0.500	U	--	--	--	--	**0.029**	--	--	--	--	--	--	--	--	**1.97**	--	--	**39.3**	--	--	**30.3**	--	--
DC-09	YVD-092617-23	9/26/2017	N	K1710333	0.100	U	--	0.500	U	--	--	--	--	0.010	U	--	--	--	--	--	--	--	**1.98**	--	--	**38.5**	--	--	**32.5**	--	--
DC-09	YVD-120417-09	12/4/2017	N	K1713026	0.100	U	--	0.500	U	--	--	--	--	0.014	U	MBK	--	--	--	--	--	--	**1.86**	--	--	**37.3**	--	--	**30.6**	--	--
DC-09	YVD-060418-25	6/4/2018	N	874860	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.08**	--	--	**40.2**	--	--	**29.2**	--	--
DC-09	YVD-060319-19	6/3/2019	N	992053	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.06**	--	--	**39.2**	--	--	**27.6**	--	--
DC-09	YVD-060920-25	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.04**	--	--	**40.8**	--	--	**30.8**	--	--
DC-09	YVD-060721-15	6/7/2021	N	124105	0.050	U	--	5.00	UJ	MS, RPD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.13**	--	--	**37.4**	--	--	**14.8**	--	--
DC-09	YVD-060722-29	6/7/2022	N	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-09	YVD-062123-22	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-09	YVD-062123-23	6/21/2023	FD	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-14	DC-14-130103	01/03/2013	N	EPA01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-14	DC-14-130917	09/17/2013	N	SWI0113	0.200	U	--	**0.310**	--	--	--	--	--	--	--	--	**0.199**	--	--	--	--	--	**5.85**	--	--	**94.9**	--	--	**34.2**	--	--
DC-14	DC-14-131211	12/11/2013	N	SWL0063	2.00	U	--	0.200	U	--	--	--	--	--	--	--	--	--	--	**0.167**	--	--	**4.71**	--	--	**94.0**	--	--	**33.9**	J-	MSD
DC-14	DC-14-140318	03/18/2014	N	SXC0095	2.00	U	--	0.250	U	--	**0.260**	--	--	--	--	--	--	--	--	--	--	--	**5.25**	--	--	**87.0**	--	--	**35.7**	J-	MSD
DC-14	DC-14-140602	06/02/2014	N	SXF0017	0.400	U	--	**0.367**	--	--	**0.420**	J+	FBK	--	--	--	--	--	--	--	--	--	**5.37**	--	--	**83.2**	--	--	**24.2**	J-	MSD
DC-14	DC-14-140923	09/23/2014	N	SXI0158	0.400	U	--	**0.315**	--	--	**0.300**	--	--	--	--	--	--	--	--	--	--	--	**4.95**	--	--	**88.6**	J+	MSD	**25.9**	--	--
DC-14	DC-14-141216	12/16/2014	N	SXL0108	0.400	U	--	0.250	U	--	**0.140**	--	--	--	--	--	--	--	--	--	--	--	**5.57**	--	--	**84.5**	--	--	**29.8**	--	--
DC-14	DC-14-150316	03/16/2015	N	5904541	0.400	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**6.10**	--	--	**100**	--	--	**38.0**	J-	MSD
DC-14	DC-14-150616	06/16/2015	N	59010961	0.400	U	--	0.250	UJ	MSD	**0.300**	--	--	--	--	--	--	--	--	--	--	--	**6.50**	J+	MSD	**85.0**	J+	MSD	**29.0**	--	--
DC-14	DC-14-150924	09/24/2015	N	59020391	0.400	U	--	0.250	UJ	MSD	**0.310**	--	--	--	--	--	--	--	--	--	--	--	**6.30**	--	--	**92.0**	--	--	**42.0**	J-	MSD
DC-14	DC-14-151214	12/14/2015	N	59025351	0.400	U	--	0.250	UJ	MSD	**0.350**	--	--	--	--	--	--	--	--	--	--	--	**6.60**	--	--	**100**	--	--	**39.0**	--	--
DC-14	YVD-D1-151214	12/14/2015	FD	59025351	0.200	U	--	0.250	UJ	MSD	**0.380**	--	--	--	--	--	--	--	--	--	--	--	**6.60**	--	--	**100**	--	--	**41.0**	--	--
DC-14	DC-14-160309	03/09/2016	N	59029711	0.400	U	--	--	R	MSD	**0.330**	--	--	--	--	--	--	--	--	--	--	--	**6.60**	--	--	**95.0**	--	--	**39.0**	J+	MSD
DC-14	DC-14-160620	6/20/2016	N	59037151	0.400	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**6.00**	--	--	**92.0**	--	--	**38.0**	--	--
DC-14	DC-14-160929	9/29/2016	N	K1611704	0.100	U	--	0.500	U	--	--	--	--	**0.009**	J	--	--	--	--	--	--	--	**4.75**	--	--	**74.9**	--	--	**23.1**	--	--
DC-14	DC-14-161216	12/16/2016	N	K1615174	0.100	U	--	0.500	U	--	--	--	--	**0.014**	--	--	--	--	--	--	--	--	**4.37**	--	--	**68.8**	--	--	**21.9**	--	--
DC-14	YVD-031317-38	3/14/2017	N	K1702542	0.100	U	--	0.500	U	--	--	--	--	**0.074**	--	--	--	--	--	--	--	--	**4.57**	--	--	**68.4**	--	--	**20.8**	--	--
DC-14	YVD-060617-19	6/6/2017	N	K1705754	0.100	U	--	0.500	U	--	--	--	--	**0.010**	J	--	--	--	--	--	--	--	**4.40**	--	--	**65.2**	--	--	**26.9**	--	--
DC-14	YVD-092517-11	9/25/2017	N	K1710274	0.100	U	--	0.500	U	--	--	--	--	**0.005**	J	--	--	--	--	--	--	--	**4.63**	--	--	**64.3**	--	--	**23.9**	--	--
DC-14	YVD-120617-27	12/6/2017	N	K1713157	0.100	U	--	0.500	U	--	--	--	--	**0.020**	--	--	--	--	--	--	--	--	**4.49**	--	--	**60.5**	--	--	**20.3**	--	--
DC-14	YVD-120617-29	12/6/2017	FD	K1713157	0.100	U	--	0.500	U	--	--	--	--	**0.021**	--	--	--	--	--	--	--	--	**4.44**	--	--	**60.6**	--	--	**20.0**	--	--
DC-14	YVD-031918-20	3/19/2018	N	870634	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.56**	--	--	**58.0**	--	--	**17.8**	--	--
DC-14	YVD-060518-28	6/5/2018	N	874860	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.62**	--	--	**56.0**	--	--	**16.1**	--	--
DC-14	YVD-060518-30	6/5/2018	FD	874860	--	R	PRS	0.500	UJ	MBK	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.78**	--	--	**57.5**	--	--	--	R	PRS
DC-14	YVD-090918-08	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.80**	--	--	**54.0**	--	--	**16.0**	--	--
DC-14	YVD-090918-10	9/9/2018	FD	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.78**	--	--	**53.5**	--	--	**15.3**	--	--
DC-14	YVD-121018-07	12/10/2018	N	884857	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.92**	--	--	**55.5**	--	--	**14.9**	--	--
DC-14	YVD-031719-09	3/17/2019	N	988239	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.05**	--	--	**53.5**	--	--	**15.1**	--	--
DC-14	YVD-060319-17	6/3/2019	N	992053	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.15**	--	--	**53.5**	--	--	**13.6**	--	--
DC-14	YVD-091019-18	9/10/2019	N	998438	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.20**	--	--	**53.5**	--	--	**17.1**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
DC-14	YVD-120919-14	12/9/2019	N	902276	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.40**			**54.5**	J	MSD	**20.3**	--	--
DC-14	YVD-033120-19	3/31/2020	N	006260	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.25**	--	--	**53.5**	--	--	**21.1**	--	--
DC-14	YVD-033120-21	3/31/2020	FD	006260	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.35**	--	--	**54.5**	--	--	**21.3**	--	--
DC-14	YVD-061020-32	6/10/2020	N	009361	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.45**	--	--	**53.0**	--	--	**22.5**	--	--
DC-14	YVD-061020-33	6/10/2020	FD	009361	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.35**	--	--	**52.0**	--	--	**22.4**	--	--
DC-14	YVD-092120-23	9/21/2020	N	013896	0.050	U	--	1.00	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.60**	--	--	**56.5**	--	--	**24.4**	--	--
DC-14	YVD-120820-21	12/8/2020	N	017137	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**6.10**	--	--	**57.5**	--	--	**26.6**	--	--
DC-14	YVD-030121-09	3/1/2021	N	119931	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**6.15**	--	--	**58.0**	--	--	**32.1**	--	--
DC-14	YVD-060821-33	6/8/2021	N	124212	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**6.35**	--	--	**57.0**	--	--	**27.9**	--	--
DC-14	YVD-121521-19	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-14	YVD-031522-16	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-14	YVD-060722-28	6/7/2022	N	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-14	YVD-091422-18	9/14/2022	N	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-14	YVD-122822-24	12/28/2022	N	K2215296	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-14	YVD-030623-16	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-14	YVD-062023-12	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-14	YVD-091123-10	9/11/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DC-14	YVD-120623-04	12/6/2023	N	K2313796	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	YVD-02-130924	09/24/2013	N	SWI0178	0.200	U	--	0.250	U	--	--	--	--	--	--	--	**0.124**	--	--	--	--	--	**3.50**	--	--	**8.56**	--	--	**5.77**	--	--
YVD-02	YVD-02-140316	03/16/2014	N	SXC0081	0.200	U	--	0.250	U	--	**0.540**	--	--	--	--	--	--	--	--	--	--	--	**12.6**	--	--	**88.6**	--	--	**66.9**	--	--
YVD-02	YVD-02-140602	06/02/2014	N	SXF0008	0.200	U	--	**0.490**	--	--	**3.80**	--	--	--	--	--	--	--	--	--	--	--	**8.53**	--	--	**23.0**	--	--	**3.12**	--	--
YVD-02	YVD-02-140921	09/21/2014	N	SXI0148	0.200	U	--	**0.274**	--	--	**1.20**	J	FDP	--	--	--	--	--	--	--	--	--	**4.53**	--	--	**11.6**	J	FDP	**13.8**	--	--
YVD-02	YVD-D1-140921	09/21/2014	FD	SXI0148	0.200	U	--	0.250	U	--	**0.860**	J	FDP	--	--	--	--	--	--	--	--	--	**5.05**	--	--	**15.7**	J	FDP	**15.6**	--	--
YVD-02	YVD-02-141215	12/15/2014	N	SXL0103	0.200	U	--	**0.358**	--	--	**0.610**	--	--	--	--	--	--	--	--	--	--	--	**5.35**	--	--	**16.1**	--	--	**33.6**	J+	MSD, DUP
YVD-02	YVD-02-150615	06/15/2015	N	59010751	0.200	U	--	0.250	UJ	MSD	**1.10**	--	--	--	--	--	--	--	--	--	--	--	**4.10**	J+	MSD	**12.0**	J+	MSD	**3.20**	J-	MSD
YVD-02	YVD-02-150923	09/23/2015	N	59020281	0.200	U	--	**0.250**	J-	MSD	**1.00**	J+	FBK		--	--	--	--	--	--	--	--	**4.80**	--	--	**14.0**	--	--	**9.50**	--	--
YVD-02	YVD-02-151214	12/14/2015	N	59025351	0.200	U	--	**0.760**	J-	MSD	**0.680**	--	--	--	--	--	--	--	--	--	--	--	**6.30**	--	--	**25.0**	--	--	**24.0**	--	--
YVD-02	YVD-02-160308	03/08/2016	N	59029521	0.200	U	--	**0.250**	J-	MSD	**0.590**	--	--	--	--	--	--	--	--	--	--	--	**5.80**	--	--	**22.0**	--	--	**54.0**	--	--
YVD-02	YVD-02-160620	6/20/2016	N	59037101	0.200	U	--	**0.350**	J-	MSD	**0.520**	--	--	--	--	--	--	--	--	--	--	--	**4.20**	--	--	**9.70**	--	--	**8.00**	J-	MSD
YVD-02	YVD-02-160928	9/28/2016	N	K1611629	0.100	U	--	0.500	U	--	--	--	--	**0.092**	--	--	--	--	--	--	--	--	**3.41**	--	--	**5.07**	--	--	**3.13**	--	--
YVD-02	YVD-030817-15	3/8/2017	N	K1702324	0.100	U	--	0.500	U	--	--	--	--	**0.099**	--	--	--	--	--	--	--	--	**3.51**	--	--	**7.06**	--	--	**11.7**	--	--
YVD-02	YVD-060617-14	6/6/2017	N	K1705754	0.100	U	--	0.500	U	--	--	--	--	**0.093**	--	--	--	--	--	--	--	--	**3.00**	--	--	**5.95**	--	--	**3.43**	J	FDP
YVD-02	YVD-060617-16	6/6/2017	FD	K1705754	0.100	U	--	0.500	U	--	--	--	--	**0.081**	--	--	--	--	--	--	--	--	**3.00**	--	--	**5.91**	--	--	**12.2**	J	FDP
YVD-02	YVD-092617-20	9/26/2017	N	K1710333	0.100	U	--	0.500	U	--	--	--	--	**0.09**	--	--	--	--	--	--	--	--	**3.06**	--	--	**5.20**	--	--	**4.79**	--	--
YVD-02	YVD-120417-02	12/4/2017	N	K1713026	0.100	U	--	0.500	U	--	--	--	--	**0.080**	--	--	--	--	--	--	--	--	**3.18**	--	--	**9.59**	--	--	**16.1**	--	--
YVD-02	YVD-120417-04	12/4/2017	FD	K1713026	0.100	U	--	0.500	U	--	--	--	--	**0.074**	--	--	--	--	--	--	--	--	**3.08**	--	--	**9.58**	--	--	**15.8**	--	--
YVD-02	YVD-061218-32	6/12/2018	N	875438	--	R	NR	--	R	NR	--	--	--	--	--	--	--	--	--	--	R	NR	--	R	NR	--	R	NR	--	R	NR
YVD-02	YVD-060419-28	6/4/2019	N	992242	**0.240**	--	--	0.500	U	--	--	--	--	--	--	--	--	--	--	**0.100**	--	--	**5.15**	--	--	**14.8**	--	--	**39.9**	--	--
YVD-02	YVD-070219-33	7/2/2019	N	994356	**0.900**	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**6.50**	--	--	**26.8**	--	--	**47.5**	--	--
YVD-02	YVD-091019-19	9/10/2019	N	998438	0.050	U	--	UJ	MSD	--	--	--	--	--	--	--	--	--	--	**0.070**	--	--	**6.60**	--	--	**21.6**	--	--	**40.4**	--	--
YVD-02	YVD-121019-23	12/10/2019	N	902321	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**7.10**	--	--	**38.3**	--	--	**62.2**	--	--
YVD-02	YVD-040120-23	4/1/2020	N	006311	**4.38**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**6.25**	--	--	**75.0**	--	--	**96.6**	--	--
YVD-02	YVD-061120-35	6/11/2020	N	009430	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	9/21/2020	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	12/8/2020	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	3/1/2021	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	6/8/2021	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	12/15/2021	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-02	NS[1]	3/15/2022	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	6/7/2022	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	9/12/2022	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	12/5/2022	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	3/6/2023	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	6/20/2023	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	9/10/2023	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-02	NS[1]	12/4/2023	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-03	YVD-03-130916	09/16/2013	N	SWI0113	**0.490**	--	--	**0.488**	--	--	--	--	--	--	--	--	**0.890**	--	--	--	--	--	**9.00**	--	--	**43.0**	--	--	**70.7**	--	--
YVD-03	YVD-03-131210	12/10/2013	N	SWL0063	0.400	U	--	0.200	U	--	--	--	--	--	--	--	--	--	--	**1.02**	--	--	**6.67**	--	--	**40.2**	--	--	**54.8**	J-	MSD
YVD-03	YVD-03-140317	03/17/2014	N	SXC0081	0.200	U	--	0.250	U	--	**0.230**	--	--	--	--	--	--	--	--	--	--	--	**4.10**	--	--	**37.6**	--	--	**38.0**	--	--
YVD-03	YVD-03-140602	06/02/2014	N	SXF0008	0.200	U	--	**0.261**	--	--	**0.300**	--	--	--	--	--	--	--	--	--	--	--	**3.93**	--	--	**36.8**	--	--	**36.0**	--	--
YVD-03	YVD-03-140923	09/23/2014	N	SXI0158	0.200	U	--	0.250	U	--	**0.330**	J	FDP	--	--	--	--	--	--	--	--	--	**4.66**	J	FDP	**40.7**	J+	MSD	**34.7**	--	--
YVD-03	YVD-D3-140923	09/23/2014	FD	SXI0158	0.200	U	--	0.250	U	--	**0.240**	J	FDP	--	--	--	--	--	--	--	--	--	**3.62**	J	FDP	**38.0**	J+	MSD	**34.4**	--	--
YVD-03	YVD-03-141215	12/15/2014	N	SXL0108	0.200	U	--	**0.400**	--	--	**0.760**	--	--	--	--	--	--	--	--	--	--	--	**4.47**	--	--	**39.1**	--	--	**37.0**	--	--
YVD-03	YVD-03-150316	03/16/2015	N	5904541	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.90**	--	--	**39.0**	--	--	**33.0**	J-	MSD
YVD-03	YVD-03-150616	06/16/2015	N	59010751	0.200	U	--	0.250	UJ	MSD	**0.590**	--	--	--	--	--	--	--	--	--	--	--	**6.10**	J+	MSD	**37.0**	J+	MSD	**41.0**	J-	MSD
YVD-03	YVD-03-150922	09/22/2015	N	59020141	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**6.50**	--	--	**40.0**	--	--	**51.0**	--	--
YVD-03	YVD-03-151214	12/14/2015	N	59025351	0.200	U	--	0.250	UJ	MSD	**0.780**	--	--	--	--	--	--	--	--	--	--	--	**7.80**	--	--	**43.0**	--	--	**51.0**	--	--
YVD-03	YVD-03-160307	03/07/2016	N	59029521	0.200	U	--	0.250	UJ	MSD	**0.340**	--	--	--	--	--	--	--	--	--	--	--	**7.10**	--	--	**40.0**	--	--	**47.0**	--	--
YVD-03	YVD-03-160620	6/20/2016	N	59037151	0.200	U	--	0.250	U	--	**0.470**	--	--	--	--	--	--	--	--	--	--	--	**7.70**	--	--	**40.0**	--	--	**61.0**	--	--
YVD-03	YVD-03-160929	9/29/2016	N	K1611758	0.100	U	--	0.500	U	--	--	--	--	**0.047**	--	--	--	--	--	--	--	--	**6.89**	--	--	**41.4**	--	--	**44.4**	--	--
YVD-03	YVD-03-161213	12/13/2016	N	K1615045	0.100	U	--	0.500	U	--	--	--	--	**0.11**	--	--	--	--	--	--	--	--	**6.57**	--	--	**38.9**	--	--	**43.3**	--	--
YVD-03	YVD-030617-02	3/6/2017	N	K1702228	0.100	U	--	0.500	U	--	--	--	--	**0.083**	J	FDP	--	--	--	--	--	--	**6.53**	--	--	**38.5**	--	--	**40.7**	--	--
YVD-03	YVD-030617-03	3/6/2017	FD	K1702228	0.100	U	--	0.500	U	--	--	--	--	**0.061**	J	FDP	--	--	--	--	--	--	**6.48**	--	--	**38.4**	--	--	**40.7**	--	--
YVD-03	YVD-060517-13	6/5/2017	N	K1705702	0.100	U	--	0.500	U	--	--	--	--	**0.045**	--	--	--	--	--	--	--	--	**6.27**	--	--	**36.4**	--	--	**46.4**	--	--
YVD-03	YVD-092517-05	9/25/2017	N	K1710274	0.100	U	--	0.500	U	--	--	--	--	**0.038**	--	--	--	--	--	--	--	--	**6.85**	--	--	**40.9**	--	--	**46.3**	--	--
YVD-03	YVD-120517-19	12/5/2017	N	K1713091	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.047**	--	--	--	--	--	--	--	--	**6.39**	--	--	**38.0**	--	--	**50.8**	--	--
YVD-03	YVD-060518-27	6/5/2018	N	874860	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**6.70**	--	--	**39.3**	--	--	**41.7**	--	--
YVD-03	YVD-060219-07	6/2/2019	N	991939	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**6.65**	--	--	**38.5**	--	--	**26.1**	--	--
YVD-03	YVD-060820-09	6/8/2020	N	009144	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**6.65**	--	--	**39.6**	--	--	**48.6**	--	--
YVD-03	YVD-060821-24	6/8/2021	N	124212	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**6.85**	--	--	**37.6**	--	--	**33.0**	--	--
YVD-03	YVD-060822-31	6/8/2022	N	K2206299	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-03	YVD-060822-32	6/8/2022	FD	K2206299	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-03	YVD-061923-04	6/19/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-04	YVD-04-130916	09/16/2013	N	SWI0113	0.200	U	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	**4.23**	--	--	**49.2**	--	--	**39.1**	--	--
YVD-04	YVD-04-131210	12/10/2013	N	SWL0063	0.400	U	--	0.200	U	--	--	--	--	--	--	--	--	--	--	**0.112**	--	--	**4.44**	--	--	**49.9**	--	--	**42.2**	J-	MSD
YVD-04	YVD-04-140317	03/17/2014	N	SXC0081	0.200	U	--	0.250	U	--	**0.078**	--	--	--	--	--	--	--	--	--	--	--	**4.46**	--	--	**47.8**	--	--	**35.2**	--	--
YVD-04	YVD-04-140602	06/02/2014	N	SXF0008	0.400	U	--	0.250	U	--	**0.053**	--	--	--	--	--	--	--	--	--	--	--	**4.41**	--	--	**50.5**	--	--	**36.2**	--	--
YVD-04	YVD-04-140923	09/23/2014	N	SXI0158	0.200	U	--	0.250	U	--	**0.061**	--	--	--	--	--	--	--	--	--	--	--	**4.49**	--	--	**52.2**	J+	MSD	**35.8**	--	--
YVD-04	YVD-04-141215	12/15/2014	N	SXL0108	0.200	U	--	0.250	U	--	0.100	U	--	--	--	--	--	--	--	--	--	--	**4.62**	--	--	**50.0**	--	--	**35.8**	--	--
YVD-04	YVD-04-150315	03/15/2015	N	5904471	0.200	U	--	0.250	UJ	MSD	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**4.70**	--	--	**52.0**	--	--	**34.0**	--	--
YVD-04	YVD-04-150615	06/15/2015	N	59010751	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.70**	J+	MSD	**49.0**	J+	MSD	**34.0**	J-	MSD
YVD-04	YVD-04-150922	09/22/2015	N	59020141	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.60**	--	--	**51.0**	--	--	**35.0**	--	--
YVD-04	YVD-04-151213	12/13/2015	N	59025351	0.200	U	--	0.250	UJ	MSD	**0.390**	--	--	--	--	--	--	--	--	--	--	--	**4.90**	--	--	**53.0**	--	--	**36.0**	--	--
YVD-04	YVD-04-160307	03/07/2016	N	59029521	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.60**	--	--	**51.0**	--	--	**34.0**	--	--
YVD-04	YVD-04-160620	6/20/2016	N	59037101	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.80**	--	--	**53.0**	--	--	**35.0**	J-	MSD
YVD-04	YVD-D1-160620	6/20/2016	FD	59037101	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.50**	--	--	**51.0**	--	--	**36.0**	J-	MSD

Table 8
Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-04	YVD-04-160928	9/28/2016	N	K1611629	0.100	U	--	0.500	U	--	--	--	--	**0.014**	--	--	--	--	--	--	--	--	**4.42**	--	--	**48.5**	--	--	**31.4**	--	--
YVD-04	YVD-04-D3-160928	9/28/2016	FD	K1611629	0.100	U	--	0.500	U	--	--	--	--	**0.008**	J	--	--	--	--	--	--	--	**4.49**	--	--	**49.9**	--	--	**32.2**	--	--
YVD-04	YVD-04-161213	12/13/2016	N	K1615045	0.100	U	--	0.500	U	--	--	--	--	**0.026**	--	--	--	--	--	--	--	--	**4.43**	--	--	**47.5**	--	--	**31.7**	--	--
YVD-04	YVD-031017-28	3/10/2017	N	K1702448	0.100	U	--	0.500	U	--	--	--	--	**0.018**	--	--	--	--	--	--	--	--	**4.25**	--	--	**46.7**	--	--	**32.9**	--	--
YVD-04	YVD-060517-11	6/5/2017	N	K1705702	0.100	U	--	0.500	U	--	--	--	--	**0.006**	J	--	--	--	--	--	--	--	**4.05**	--	--	**44.4**	--	--	**33.4**	--	--
YVD-04	YVD-092517-07	9/25/2017	N	K1710274	0.100	U	--	0.500	U	--	--	--	--	**0.026**	--	--	--	--	--	--	--	--	**4.62**	--	--	**51.1**	--	--	**32.7**	--	--
YVD-04	YVD-120417-13	12/4/2017	N	K1713091	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.013**	--	--	--	--	--	--	--	--	**4.29**	--	--	**49.9**	--	--	**32.5**	--	--
YVD-04	YVD-060418-21	6/4/2018	N	874662	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.46**	--	--	**51.0**	--	--	**30.4**	--	--
YVD-04	YVD-060219-05	6/2/2019	N	991939	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.52**	--	--	**49.0**	--	--	**30.6**	--	--
YVD-04	YVD-060820-05	6/8/2020	N	009144	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.32**	--	--	**49.8**	--	--	**30.5**	--	--
YVD-04	YVD-060821-22	6/8/2021	N	124212	0.050	U	--	1.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.32**	--	--	**47.4**	--	--	**29.5**	--	--
YVD-04	YVD-060622-17	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-04	YVD-061923-03	6/19/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-05	YVD-05-130917	09/17/2013	N	SWI0113	0.200	U	--	**0.435**	--	--	--	--	--	--	--	--	**1.62**	--	--	--	--	--	**6.95**	--	--	**46.2**	--	--	**76.8**	--	--
YVD-05	YVD-05-131211	12/11/2013	N	SWL0063	0.400	U	--	0.200	U	--	--	--	--	--	--	--	--	--	--	**0.462**	--	--	**3.33**	--	--	**45.5**	--	--	**68.4**	J-	MSD
YVD-05	YVD-05-140317	03/17/2014	N	SXC0081	0.400	U	--	0.250	U	--	**0.140**	--	--	--	--	--	--	--	--	--	--	--	**2.75**	--	--	**43.1**	--	--	**52.7**	--	--
YVD-05	YVD-05-140601	06/01/2014	N	SXF0008	0.400	U	--	0.250	U	--	**0.150**	--	--	--	--	--	--	--	--	--	--	--	**2.84**	--	--	**43.9**	--	--	**50.5**	--	--
YVD-05	YVD-05-140922	09/22/2014	N	SXI0148	0.400	U	--	**0.259**	--	--	**0.200**	--	--	--	--	--	--	--	--	--	--	--	**2.75**	--	--	**45.1**	--	--	**48.1**	--	--
YVD-05	YVD-05-141215	12/15/2014	N	SXL0103	0.400	U	--	**0.272**	--	--	**0.290**	J	FDP	--	--	--	--	--	--	--	--	--	**4.21**	--	--	**45.5**	--	--	**27.7**	J+	MSD, FDP, DUP
YVD-05	YVD-D1-141215	12/15/2014	FD	SXL0103	0.200	U	--	**0.264**	--	--	**0.440**	J	FDP	--	--	--	--	--	--	--	--	--	**3.54**	--	--	**44.9**	--	--	**46.0**	J+	MSD, FDP, DUP
YVD-05	YVD-05-150316	03/16/2015	N	5904471	0.400	U	--	0.250	UJ	--	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**3.60**	--	--	**47.0**	--	--	**47.0**	--	--
YVD-05	YVD-05-150616	06/16/2015	N	59010751	0.400	U	--	0.250	UJ	--	**0.510**	--	--	--	--	--	--	--	--	--	--	--	**4.00**	J+	MSD	**47.0**	J+	MSD	**49.0**	J-	MSD
YVD-05	YVD-05-150922	09/22/2015	N	59020281	0.400	U	--	--	R	MSD	**0.800**	--	--	--	--	--	--	--	--	--	--	--	**4.90**	--	--	**51.0**	--	--	**51.0**	--	--
YVD-05	YVD-05-151214	12/14/2015	N	59025351	0.400	U	--	**0.600**	J-	MSD	**0.650**	--	--	--	--	--	--	--	--	--	--	--	**4.30**	--	--	**52.0**	--	--	**48.0**	--	--
YVD-05	YVD-05-160307	03/07/2016	N	59029521	0.400	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.60**	--	--	**48.0**	--	--	**47.0**	--	--
YVD-05	YVD-D1-160307	03/07/2016	FD	59029521	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.60**	--	--	**48.0**	--	--	**48.0**	--	--
YVD-05	YVD-05-160620	6/20/2016	N	59037151	0.400	U	--	0.250	U	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.40**	--	--	**48.0**	--	--	**49.0**	--	--
YVD-05	YVD-05-160928	9/28/2016	N	K1611698	0.100	U	--	--	R	MSD	--	--	--	**0.01**	--	--	--	--	--	--	--	--	**3.54**	--	--	**48.5**	--	--	**46.7**	--	--
YVD-05	YVD-05-161215	12/15/2016	N	K1615174	0.100	U	--	0.500	U	--	--	--	--	**0.04**	--	--	--	--	--	--	--	--	**3.37**	--	--	**46.5**	--	--	**49.0**	--	--
YVD-05	YVD-031317-32	3/13/2017	N	K1702489	0.100	U	--	0.500	U	--	--	--	--	**0.03**	--	--	--	--	--	--	--	--	**3.44**	--	--	**46.0**	--	--	**41.5**	--	--
YVD-05	YVD-031317-34	3/13/2017	FD	K1702489	0.100	U	--	0.500	U	--	--	--	--	**0.02**	--	--	--	--	--	--	--	--	**3.38**	--	--	**45.6**	--	--	**41.4**	--	--
YVD-05	YVD-060617-23	6/6/2017	N	K1705754	0.100	U	--	0.500	U	--	--	--	--	**0.016**	--	--	--	--	--	--	--	--	**3.51**	--	--	**48.1**	--	--	**48.0**	--	--
YVD-05	YVD-092517-09	9/25/2017	N	K1710274	0.100	U	--	0.500	U	--	--	--	--	**0.012**	--	--	--	--	--	--	--	--	**3.61**	--	--	**48.4**	--	--	**46.6**	--	--
YVD-05	YVD-120517-15	12/5/2017	N	K1713091	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.015**	--	--	--	--	--	--	--	--	**3.36**	--	--	**46.5**	--	--	**41.8**	--	--
YVD-05	YVD-060518-29	6/5/2018	N	874860	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.58**	--	--	**46.4**	--	--	**43.6**	--	--
YVD-05	YVD-060219-09	6/2/2019	N	991939	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.62**	--	--	**44.2**	--	--	**43.6**	--	--
YVD-05	YVD-060920-15	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.66**	--	--	**46.2**	--	--	**50.0**	--	--
YVD-05	YVD-060821-26	6/8/2021	N	124212	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.94**	--	--	**47.7**	--	--	**61.1**	--	--
YVD-05	YVD-060622-19	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-05	YVD-062023-09	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-06	YVD-06-130917	09/17/2013	N	SWI0113	0.200	U	--	**0.400**	--	--	--	--	--	--	--	--	**0.410**	--	--	--	--	--	**4.07**	--	--	**17.6**	--	--	**8.14**	--	--
YVD-06	YVD-06-131209	12/09/2013	N	SWL0055	0.200	U	--	**0.620**	J	FBK, MSD, FDP	--	--	--	--	--	--	--	--	--	0.060	U	--	**1.76**	--	--	**13.0**	J	FDP	**8.53**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-06	YVD-D1-131209	12/09/2013	FD	SWL0055	2.00	U	--	**0.400**	J	FBK, MSD, FDP	--	--	--	--	--	--	--	--	--	0.060	U	--	**2.24**	--	--	**16.5**	J	FDP	**9.10**	--	--
YVD-06	YVD-06-140316	03/16/2014	N	SXC0081	0.200	U	--	**0.297**	--	--	**0.140**	--	--	--	--	--	--	--	--	--	--	--	**2.68**	--	--	**16.2**	--	--	**8.33**	--	--
YVD-06	YVD-D1-140316	03/16/2014	FD	SXC0081	0.200	U	--	0.250	U	--	**0.130**	--	--	--	--	--	--	--	--	--	--	--	**2.74**	--	--	**16.6**	--	--	**8.18**	--	--
YVD-06	YVD-06-140601	06/01/2014	N	SXF0008	0.200	U	--	0.250	U	--	**0.064**	--	--	--	--	--	--	--	--	--	--	--	**2.28**	--	--	**16.7**	--	--	**7.59**	--	--
YVD-06	YVD-D1-140601	06/01/2014	FD	SXF0008	0.200	U	--	0.250	U	--	**0.057**	--	--	--	--	--	--	--	--	--	--	--	**2.30**	--	--	**16.9**	--	--	**7.63**	--	--
YVD-06	YVD-06-140921	09/21/2014	N	SXI0148	0.200	U	--	**0.359**	--	--	**0.180**	--	--	--	--	--	--	--	--	--	--	--	**2.69**	--	--	**17.4**	--	--	**7.98**	--	--
YVD-06	YVD-06-141215	12/15/2014	N	SXL0103	0.200	U	--	0.250	U	--	0.100	U	--	--	--	--	--	--	--	--	--	--	**2.58**	--	--	**16.9**	--	--	**7.47**	J+	MSD, DUP
YVD-06	YVD-06-150316	03/16/2015	N	5904471	0.200	U	--	0.250	UJ	MSD	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**2.20**	--	--	**17.0**	--	--	**10.0**	--	--
YVD-06	YVD-06-150616	06/16/2015	N	59010751	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.20**	J+	MSD	**17.0**	J+	MSD	**7.90**	J-	MSD
YVD-06	YVD-06-150922	09/22/2015	N	59020141	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.10**	--	--	**17.0**	--	--	**7.90**	--	--
YVD-06	YVD-06-151214	12/14/2015	N	59025351	0.200	U	--	**0.570**	J-	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.40**	--	--	**18.0**	--	--	**8.00**	--	--
YVD-06	YVD-06-160307	03/07/2016	N	59029521	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.50**	--	--	**17.0**	--	--	**7.80**	--	--
YVD-06	YVD-06-160620	6/20/2016	N	59037151	0.200	U	--	**0.420**	--	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.30**	--	--	**17.0**	--	--	**8.10**	--	--
YVD-06	YVD-06-160929	9/29/2016	N	K1611704	0.100	U	--	0.500	U	--	--	--	--	**0.022**	--	--	--	--	--	--	--	--	**2.26**	--	--	**17.1**	--	--	**8.55**	--	--
YVD-06	YVD-06-161215	12/15/2016	N	K1615126	0.100	U	--	0.500	U	--	--	--	--	**0.010**	--	--	--	--	--	--	--	--	**2.12**	--	--	**17.1**	--	--	**10.2**	--	--
YVD-06	YVD-030617-04	3/6/2017	N	K1702228	0.100	U	--	0.500	U	FBK	--	--	--	**0.014**	--	--	--	--	--	--	--	--	**2.20**	--	--	**17.0**	--	--	**8.38**	--	--
YVD-06	YVD-060617-21	6/6/2017	N	K1705754	0.100	U	--	0.500	U	--	--	--	--	**0.010**	J	--	--	--	--	--	--	--	**2.17**	--	--	**16.3**	--	--	**8.44**	--	--
YVD-06	YVD-092617-17	9/26/2017	N	K1710333	0.100	U	--	0.500	U	--	--	--	--	**0.009**	J	--	--	--	--	--	--	--	**1.97**	--	--	**15.6**	--	--	**9.61**	--	--
YVD-06	YVD-092617-18	9/26/2017	FD	K1710333	0.100	U	--	0.500	U	--	--	--	--	**0.010**	J	--	--	--	--	--	--	--	**2.03**	--	--	**16.1**	--	--	**9.58**	--	--
YVD-06	YVD-120517-17	12/5/2017	N	K1713091	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.021**	--	--	--	--	--	--	--	--	**2.11**	--	--	**17.3**	--	--	**9.87**	--	--
YVD-06	YVD-060318-15	6/3/2018	N	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.36**	--	--	**17.3**	--	--	**7.86**	--	--
YVD-06	YVD-060219-11	6/2/2019	N	991939	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.20**	--	--	**16.6**	--	--	**6.42**	--	--
YVD-06	YVD-060920-17	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.16**	--	--	**17.6**	--	--	**8.86**	--	--
YVD-06	YVD-060721-19	6/7/2021	N	124105	0.050	U	--	0.500	UJ	MS, RPD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.28**	--	--	**16.2**	--	--	**6.80**	--	--
YVD-06	YVD-062023-06	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-06	YVD-062023-07	6/20/2023	FD	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-07	YVD-07-130923	09/23/2013	N	SWI0178	--	--	--	**0.395**	--	--	--	--	--	--	--	--	**0.516**	--	--	--	--	--	**5.03**	--	--	**37.7**	--	--	--	--	--
YVD-07	YVD-07-130926	09/26/2013	N	SWI0190	0.200	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**37.4**	--	--
YVD-07	YVD-07-131210	12/10/2013	N	SWL0055	0.200	U	--	0.200	UJ	MSD	--	--	--	--	--	--	--	--	--	0.060	U	--	1.00	U	--	**40.4**	--	--	**50.0**	--	--
YVD-07	YVD-07-140316	03/16/2014	N	SXC0081	0.200	U	--	0.250	U	--	**0.220**	--	--	--	--	--	--	--	--	--	--	--	**4.45**	--	--	**42.5**	--	--	**69.2**	--	--
YVD-07	YVD-07-140604	06/04/2014	N	SXF0025	0.400	U	--	**0.348**	J-	MSD	**0.690**	--	--	--	--	--	--	--	--	--	--	--	**5.57**	--	--	**44.5**	--	--	**57.0**	--	--
YVD-07	YVD-07-140922	09/22/2014	N	SXI0158	0.400	U	--	0.250	U	--	**0.200**	--	--	--	--	--	--	--	--	--	--	--	**4.05**	--	--	**42.7**	J+	MSD	**51.8**	--	--
YVD-07	YVD-07-141216	12/16/2014	N	SXL0108	0.400	U	--	0.250	U	--	0.100	U	--	--	--	--	--	--	--	--	--	--	**3.83**	--	--	**40.6**	--	--	**51.2**	--	--
YVD-07	YVD-07-150316	03/16/2015	N	5904541	0.400	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.30**	--	--	**50.0**	--	--	**73.0**	J-	MSD
YVD-07	YVD-D2-150316	03/16/2015	FD	5904541	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.30**	--	--	**48.0**	--	--	**70.0**	J-	MSD
YVD-07	YVD-07-150616	06/16/2015	N	59010751	0.400	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.20**	J+	MSD	**43.0**	J+	MSD	**74.0**	J-	MSD
YVD-07	YVD-D1-150616	06/16/2015	FD	59010751	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.20**	J+	MSD	**44.0**	J+	MSD	**74.0**	J-	MSD
YVD-07	YVD-07-150923	09/23/2015	N	59020281	0.400	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.20**	--	--	**48.0**	--	--	**68.0**	--	--
YVD-07	YVD-07-151214	12/14/2015	N	59025431	0.400	U	--	--	R	MSD	**0.970**	J	FDP	--	--	--	--	--	--	--	--	--	**4.50**	--	--	**48.0**	--	--	**59.0**	--	--
YVD-07	YVD-07-160308	03/08/2016	N	59029711	0.400	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.00**	--	--	**42.0**	--	--	**49.0**	J+	MSD
YVD-07	YVD-07-160621	6/21/2016	N	59037151	0.400	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.50**	--	--	**37.0**	--	--	**31.0**	--	--
YVD-07	YVD-07-160929	9/29/2016	N	K1611704	0.100	U	--	0.500	U	--	--	--	--	**0.020**	--	--	--	--	--	--	--	--	**3.31**	--	--	**34.0**	--	--	**37.1**	--	--
YVD-07	YVD-07-161213	12/13/2016	N	K1615083	0.100	U	--	0.500	U	--	--	--	--	**0.010**	J	--	--	--	--	--	--	--	**3.59**	--	--	**36.6**	--	--	**64.0**	--	--
YVD-07	YVD-030717-07	3/7/2017	N	K1702324	0.100	UJ	HTQ	0.500	U	--	--	--	--	**0.019**	--	--	--	--	--	--	--	--	**2.83**	--	--	**31.4**	--	--	**25.4**	--	--
YVD-07	YVD-060517-15	6/5/2017	N	K1705754	0.100	U	--	0.500	U	--	--	--	--	**0.004**	J	--	--	--	--	--	--	--	**2.98**	--	--	**32.9**	--	--	**33.5**	--	--
YVD-07	YVD-092617-21	9/26/2017	N	K1710333	0.100	U	--	0.500	U	--	--	--	--	**0.022**	--	--	--	--	--	--	--	--	**3.26**	--	--	**34.0**	--	--	**51.0**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-07	YVD-120417-11	12/4/2017	N	K1713026	0.100	U	--	0.500	U	--	--	--	--	**0.022**	--	--	--	--	--	--	--	--	**3.56**	--	--	**36.1**	--	--	**56.5**	--	--
YVD-07	YVD-060418-23	6/4/2018	N	874662	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.76**	--	--	**39.4**	--	--	**63.5**	--	--
YVD-07	YVD-060319-16	6/3/2019	N	992053	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.76**	--	--	**35.8**	--	--	**27.6**	--	--
YVD-07	YVD-060920-27	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.27**	--	--	**41.8**	--	--	**62.9**	--	--
YVD-07	YVD-060821-34	6/8/2021	N	124212	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.28**	--	--	**37.6**	--	--	**40.8**	--	--
YVD-07	YVD-060622-21	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-07	YVD-060622-22	6/6/2022	FD	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-07	YVD-062023-19	6/20/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-08	YVD-08-130919	09/19/2013	N	SWI0138	2.00	U	--	**0.935**	J+	FBK	--	--	--	--	--	--	0.100	U	--	--	--	--	**6.03**	--	--	**88.3**	--	--	**105**	--	--
YVD-08	YVD-08-131211	12/11/2013	N	SWL0063	2.00	U	--	0.750	U	ERL	--	--	--	--	--	--	--	--	--	**1.46**	--	--	**7.55**	--	--	**82.2**	--	--	**273**	J-	MSD
YVD-08	YVD-08-140317	03/17/2014	N	SXC0095	2.00	U	--	**0.702**	--	--	**0.130**	--	--	--	--	--	--	--	--	--	--	--	**5.30**	--	--	**75.1**	--	--	**173**	J-	MSD
YVD-08	YVD-08-140602	06/02/2014	N	SXF0017	0.800	U	--	**1.12**	--	--	**2.70**	--	--	--	--	--	--	--	--	--	--	--	**11.2**	--	--	**78.3**	--	--	**175**	J-	MSD
YVD-08	YVD-08-140923	09/23/2014	N	SXI0173	1.00	U	--	**0.867**	J+	MSD	**0.350**	--	--	--	--	--	--	--	--	--	--	--	**5.87**	--	--	**76.9**	--	--	**107**	--	--
YVD-08	YVD-08-141216	12/16/2014	N	SXL0108	1.00	U	--	**0.369**	--	--	**0.340**	--	--	--	--	--	--	--	--	--	--	--	**5.92**	--	--	**77.2**	--	--	**140**	--	--
YVD-08	YVD-08-150317	03/17/2015	N	5904541	1.00	U	--	**0.390**	J-	MSD	**0.670**	--	--	--	--	--	--	--	--	--	--	--	**5.90**	--	--	**77.0**	--	--	**130**	J-	MSD
YVD-08	YVD-D3-150317	03/17/2015	FD	5904541	0.200	U	--	0.250	UJ	MSD	**0.490**	--	--	--	--	--	--	--	--	--	--	--	**5.70**	--	--	**76.0**	--	--	**150**	J-	MSD
YVD-08	YVD-08-150617	06/17/2015	N	59010961	1.00	U	--	**0.260**	J-	MSD, FDP	**0.530**	--	--	--	--	--	--	--	--	--	--	--	**6.00**	J+	MSD	**82.0**	J+	MSD	**140**	--	--
YVD-08	YVD-D3-150617	06/17/2015	FD	59010961	0.200	U	--	**0.860**	J-	MSD, FDP	**0.390**	--	--	--	--	--	--	--	--	--	--	--	**5.70**	J+	MSD	**77.0**	J+	MSD	**170**	--	--
YVD-08	YVD-08-150924	09/24/2015	N	59020391	1.00	U	--	0.250	UJ	MSD	**0.310**	--	--	--	--	--	--	--	--	--	--	--	**5.60**	--	--	**82.0**	--	--	**170**	J-	MSD
YVD-08	YVD-08-151215	12/15/2015	N	59025501	1.00	U	--	--	R	MSD	**0.330**	J-	MSD	--	--	--	--	--	--	--	--	--	**6.20**	--	--	**85.0**	--	--	**190**	--	--
YVD-08	YVD-D3-151215	12/15/2015	FD	59025501	0.200	U	--	--	R	MSD	**0.270**	J-	MSD	--	--	--	--	--	--	--	--	--	**6.20**	--	--	**85.0**	--	--	**180**	--	--
YVD-08	YVD-08-160310	03/10/2016	N	59029941	1.00	U	--	0.250	UJ	FDP, MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**5.60**	--	--	**87.0**	--	--	**210**	J	DUP
YVD-08	YVD-08-160622	6/22/2016	N	59037271	1.00	U	--	--	R	MSD	**0.310**	--	--	--	--	--	--	--	--	--	--	--	**5.90**	--	--	**87.0**	--	--	**200**	--	--
YVD-08	YVD-D3-160622	6/22/2016	FD	59037271	0.200	U	--	--	R	MSD	**0.280**	--	--	--	--	--	--	--	--	--	--	--	**6.00**	--	--	**88.0**	--	--	**200**	--	--
YVD-08	YVD-08-160927	9/27/2016	N	K1611565	0.100	U	--	--	R	MSD	--	--	--	**0.049**	--	--	--	--	--	--	--	--	**4.95**	--	--	**84.7**	--	--	**193**	--	--
YVD-08	YVD-08-161213	12/13/2016	N	K1615045	0.100	U	--	0.500	U	--	--	--	--	**0.058**	--	--	--	--	--	--	--	--	**5.10**	--	--	**84.5**	--	--	**182**	--	--
YVD-08	YVD-030917-24	3/9/2017	N	K1702448	0.100	U	--	0.500	U	--	--	--	--	**0.018**	--	--	--	--	--	--	--	--	**4.95**	--	--	**83.4**	--	--	**203**	--	--
YVD-08	YVD-060717-29	6/7/2017	N	K1705833	0.100	U	--	0.500	U	--	--	--	--	**0.025**	--	--	--	--	--	--	--	--	**5.13**	--	--	**92.1**	--	--	**194**	--	--
YVD-08	YVD-092617-19	9/26/2017	N	K1710333	0.100	U	--	0.500	U	--	--	--	--	**0.01**	--	--	--	--	--	--	--	--	**5.12**	--	--	**89.3**	--	--	**213**	--	--
YVD-08	YVD-120517-23	12/5/2017	N	K1713157	0.100	U	--	0.500	U	--	--	--	--	**0.013**	--	--	--	--	--	--	--	--	**5.23**	--	--	**93.2**	--	--	**184**	--	--
YVD-08	YVD-031918-15	3/19/2018	N	870634	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.40**	--	--	**90.5**	--	--	**183**	--	--
YVD-08	YVD-060518-31	6/5/2018	N	874860	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.55**	--	--	**98.0**	--	--	**197**	--	--
YVD-08	YVD-090918-04	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.70**	--	--	**99.5**	--	--	**195**	--	--
YVD-08	YVD-121118-19	12/11/2018	N	884939	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**6.00**	--	--	**98.5**	--	--	**207**	--	--
YVD-08	YVD-031719-03	3/17/2019	N	988239	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.50**	--	--	**96.0**	--	--	**203**	--	--
YVD-08	YVD-060319-21	6/3/2019	N	992053	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.55**	--	--	**97.5**	--	--	**190**	--	--
YVD-08	YVD-090919-02	9/9/2019	N	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.45**	--	--	**91.5**	--	--	**184**	--	--
YVD-08	YVD-120919-02	12/9/2019	N	902276	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.55**	--	--	**96.5**	J	MSD	**177**	--	--
YVD-08	YVD-120919-04	12/9/2019	FD	902276	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.55**	--	--	**96.0**	J	MSD	**173**	--	--
YVD-08	YVD-033120-17	3/31/2020	N	006260	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.35**	--	--	**99.0**	--	--	**184**	--	--
YVD-08	YVD-060920-23	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.50**	--	--	**106**	--	--	**176**	--	--
YVD-08	YVD-092120-11	9/21/2020	N	013896	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.60**	--	--	**104**	--	--	**179**	--	--
YVD-08	YVD-120720-11	12/7/2020	N	017035	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**6.05**	--	--	**104**	--	--	**174**	--	--
YVD-08	YVD-030121-07	3/1/2021	N	119931	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.55**	--	--	**102**	--	--	**177**	--	--
YVD-08	YVD-060821-28	6/8/2021	N	124212	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.45**	--	--	**102**	--	--	**179**	--	--
YVD-08	YVD-121521-20	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 8
Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-08	YVD-031522-12	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-08	YVD-060722-27	6/7/2022	N	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-08	YVD-091322-05	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-08	YVD-122722-19	12/27/2022	N	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-08	YVD-030623-13	3/6/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-08	YVD-062123-28	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-08	YVD-091023-01	9/10/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-08	YVD-120423-03	12/4/2023	N	K2313548	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-09	YVD-09-130919	09/19/2013	N	SWI0138	2.00	U	--	--	R	FBK	--	--	--	--	--	--	--	R	FBK	--	--	--	**8.21**	--	--	**189**	--	--	**236**	--	--
YVD-09	YVD-09-131212	12/12/2013	N	SWL0078	2.00	U	--	0.661	U	ERL	--	--	--	--	--	--	--	--	--	**0.647**	--	--	**9.21**	--	--	**176**	--	--	**193**	--	--
YVD-09	YVD-09-140319	03/19/2014	N	SXC0107	2.00	U	--	**0.653**	J-	MSD	**0.530**	--	--	--	--	--	--	--	--	--	--	--	**9.33**	--	--	**173**	--	--	**214**	--	--
YVD-09	YVD-09-140603	06/03/2014	N	SXF0025	2.00	U	--	**0.613**	J-	MSD	**0.720**	--	--	--	--	--	--	--	--	--	--	--	**10.1**	--	--	**193**	--	--	**214**	--	--
YVD-09	YVD-09-140924	09/24/2014	N	SXI0173	2.00	U	--	**0.502**	J+	MSD	**0.320**	J+	FBK	--	--	--	--	--	--	--	--	--	**8.88**	--	--	**203**	--	--	**166**	--	--
YVD-09	YVD-09-141217	12/17/2014	N	SXL0121	2.00	U	--	0.250	UJ	MSD	**1.30**	--	--	--	--	--	--	--	--	--	--	--	**12.9**	--	--	**187**	--	--	**223**	--	--
YVD-09	YVD-09-150318	03/18/2015	N	5904651	2.00	U	--	0.250	UJ	MSD	**0.380**	--	--	--	--	--	--	--	--	--	--	--	**9.30**	J-	MSD	**190**	--	--	**190**	--	--
YVD-09	YVD-09-150617	06/17/2015	N	59010961	2.00	U	--	**0.370**	J-	MSD	**0.360**	--	--	--	--	--	--	--	--	--	--	--	**9.80**	J+	MSD	**190**	J+	MSD	**230**	--	--
YVD-09	YVD-09-150923	09/23/2015	N	59020391	0.200	U	--	**0.260**	J-	MSD	**0.270**	--	--	--	--	--	--	--	--	--	--	--	**9.60**	--	--	**180**	--	--	**270**	J-	MSD
YVD-09	YVD-09-151215	12/15/2015	N	59025501	2.00	U	--	--	R	MSD	**0.250**	J-	MSD	--	--	--	--	--	--	--	--	--	**9.60**	--	--	**190**	--	--	**250**	--	--
YVD-09	YVD-09-160310	03/10/2016	N	59029941	2.00	U	--	0.250	UJ	FDP, MSD	**0.330**	--	--	--	--	--	--	--	--	--	--	--	**9.20**	--	--	**190**	--	--	**250**	J	DUP
YVD-09	YVD-09-160622	6/22/2016	N	59037271	2.00	U	--	--	R	MSD	**0.290**	--	--	--	--	--	--	--	--	--	--	--	**8.90**	--	--	**190**	--	--	**260**	--	--
YVD-09	YVD-09-160929	9/29/2016	N	K1611704	0.100	U	--	0.500	U	--	--	--	--	**0.016**	--	--	--	--	--	--	--	--	**7.62**	--	--	**184**	--	--	**243**	--	--
YVD-09	YVD-09-161213	12/13/2016	N	K1615045	0.100	U	--	0.500	U	--	--	--	--	**0.048**	--	--	--	--	--	--	--	--	**8.42**	--	--	**185**	--	--	**238**	--	--
YVD-09	YVD-D2-161213	12/13/2016	FD	K1615045	0.100	U	--	0.500	U	--	--	--	--	**0.078**	--	--	--	--	--	--	--	--	**8.04**	--	--	**181**	--	--	**240**	--	--
YVD-09	YVD-031317-35	3/13/2017	N	K1702489	**0.040**	J	--	0.500	U	--	--	--	--	**0.025**	--	--	--	--	--	--	--	--	**7.78**	--	--	**185**	--	--	**225**	--	--
YVD-09	YVD-060517-08	6/5/2017	N	K1705702	0.100	U	--	0.500	U	--	--	--	--	**0.007**	J	--	--	--	--	--	--	--	**6.98**	--	--	**163**	--	--	**237**	--	--
YVD-09	YVD-092617-29	9/26/2017	N	K1710381	0.100	U	--	0.500	U	--	--	--	--	**0.029**	--	--	--	--	--	--	--	--	**8.07**	--	--	**175**	--	--	**223**	--	--
YVD-09	YVD-092617-30	9/26/2017	FD	K1710381	0.100	U	--	0.500	U	--	--	--	--	**0.039**	--	--	--	--	--	--	--	--	**8.11**	--	--	**176**	--	--	**224**	--	--
YVD-09	YVD-120517-21	12/5/2017	N	K1713091	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.009**	J	--	--	--	--	--	--	--	**7.27**	--	--	**174**	--	--	**211**	--	--
YVD-09	YVD-031918-18	3/19/2018	N	870634	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**7.80**	--	--	**166**	--	--	**180**	--	--
YVD-09	YVD-060318-13	6/3/2018	N	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**8.35**	--	--	**182**	--	--	**182**	--	--
YVD-09	YVD-090918-06	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**8.10**	--	--	**174**	--	--	**172**	--	--
YVD-09	YVD-121118-15	12/11/2018	N	884939	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**8.60**	--	--	**172**	--	--	**166**	--	--
YVD-09	YVD-121118-17	12/11/2018	FD	884939	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**8.75**	--	--	**175**	--	--	**170**	--	--
YVD-09	YVD-031719-05	3/17/2019	N	988239	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**8.05**	--	--	**166**	--	--	**162**	--	--
YVD-09	YVD-060319-15	6/3/2019	N	992053	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**8.00**	--	--	**166**	--	--	**146**	--	--
YVD-09	YVD-090919-04	9/9/2019	N	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**8.20**	--	--	**160**	--	--	**148**	--	--
YVD-09	YVD-120919-06	12/9/2019	N	902276	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U		**8.40**	--	--	**166**	J	MSD	**143**	--	--
YVD-09	YVD-033020-05	3/30/2020	N	006241	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**7.95**	--	--	**163**	--	--	**150**	--	--
YVD-09	YVD-060920-24	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**7.90**	--	--	**167**	--	--	**158**	--	--
YVD-09	YVD-092120-16	9/21/2020	N	013896	0.050	U	--	2.50	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**7.85**	--	--	**164**	--	--	**151**	--	--
YVD-09	YVD-120720-13	12/7/2020	N	017035	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**8.65**	--	--	**164**	--	--	**159**	--	--
YVD-09	YVD-030121-05	3/1/2021	N	119931	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**8.05**	--	--	**161**	--	--	**152**	--	--
YVD-09	YVD-060721-18	6/7/2021	N	124105	0.050	U	--	5.00	UJ	MS, RPD	--	--	--	--	--	--	--	--	--	0.070	U	--	**8.15**	--	--	**157**	--	--	**135**	--	--
YVD-09	YVD-121421-09	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-09	YVD-031522-14	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-09	YVD-060622-12	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-09	YVD-091322-07	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-09	YVD-120822-15	12/8/2022	N	K2214578	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-09	YVD-030623-19	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-09	YVD-062123-30	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-09	YVD-091123-07	9/11/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-09	YVD-091123-09	9/11/2023	FD	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-09	YVD-120423-13	12/4/2023	N	K2313657	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-10	YVD-10-130917	09/17/2013	N	SWI0123	2.00	U	--	0.250	U	--	--	--	--	--	--	--	**0.148**	--	--	--	--	--	**3.28**	--	--	**104**	--	--	**199**	--	--
YVD-10	YVD-10-131212	12/12/2013	N	SWL0078	2.00	U	--	0.650	U	ERL	--	--	--	--	--	--	--	--	--	**1.40**	--	--	**4.49**	--	--	**102**	--	--	**174**	--	--
YVD-10	YVD-10-140319	03/19/2014	N	SXC0107	2.00	U	--	**0.507**	J-	MSD	**0.770**	--	--	--	--	--	--	--	--	--	--	--	**3.93**	--	--	**96.8**	--	--	**163**	--	--
YVD-10	YVD-10-140603	06/03/2014	N	SXF0025	2.00	U	--	**0.577**	J-	MSD	**0.800**	--	--	--	--	--	--	--	--	--	--	--	**4.07**	--	--	**103**	--	--	**188**	--	--
YVD-10	YVD-10-140924	09/24/2014	N	SXI0173	2.00	U	--	**0.443**	J+	MSD	**0.480**	J+	FBK	--	--	--	--	--	--	--	--	--	**3.86**	--	--	**116**	--	--	**217**	--	--
YVD-10	YVD-10-141217	12/17/2014	N	SXL0144	2.00	U	--	--	R	MSD	**0.690**	J-	MSD	--	--	--	--	--	--	--	--	--	**3.88**	--	--	**110**	--	--	**180**	--	--
YVD-10	YVD-10-150318	03/18/2015	N	5904651	2.00	U	--	0.250	UJ	MSD	**0.420**	--	--	--	--	--	--	--	--	--	--	--	**4.00**	J-	MSD	**130**	--	--	**370**	--	--
YVD-10	YVD-10-150617	06/17/2015	N	59010961	2.00	U	--	**0.440**	J-	MSD	**0.720**	--	--	--	--	--	--	--	--	--	--	--	**4.60**	J+	MSD	**130**	J+	MSD	**110**	--	--
YVD-10	YVD-10-150923	09/23/2015	N	59020391	2.00	U	--	0.250	UJ	MSD	**0.560**	--	--	--	--	--	--	--	--	--	--	--	**4.30**	--	--	**120**	--	--	**370**	J-	MSD
YVD-10	YVD-10-151214	12/14/2015	N	59025351	2.00	U	--	0.250	UJ	MSD	**0.580**	--	--	--	--	--	--	--	--	--	--	--	**4.30**	--	--	**120**	--	--	**360**	--	--
YVD-10	YVD-10-160309	03/09/2016	N	59029711	2.00	U	--	--	R	MSD	**0.420**	--	--	--	--	--	--	--	--	--	--	--	**4.10**	--	--	**120**	--	--	**280**	J+	MSD
YVD-10	YVD-10-160621	6/21/2016	N	59037271	2.00	U	--	--	R	MSD	**0.710**	--	--	--	--	--	--	--	--	--	--	--	**4.50**	--	--	**110**	--	--	**240**	--	--
YVD-10	YVD-10-160929	9/29/2016	N	K1611698	0.100	U	--	--	R	MSD	--	--	--	**0.028**	--	--	--	--	--	--	--	--	**2.48**	--	--	**114**	--	--	**223**	--	--
YVD-10	YVD-10-161212	12/12/2016	N	K1615029	0.100	U	--	0.500	U	--	--	--	--	**0.074**	--	--	--	--	--	--	--	--	**2.68**	--	--	**118**	--	--	**191**	--	--
YVD-10	YVD-030917-27	3/9/2017	N	K1702448	0.100	U	--	0.500	U	--	--	--	--	**0.066**	--	--	--	--	--	--	--	--	**2.89**	--	--	**133**	--	--	**799**	--	--
YVD-10	YVD-060617-22	6/6/2017	N	K1705754	0.100	U	--	0.500	U	--	--	--	--	**0.036**	--	--	--	--	--	--	--	--	**2.57**	--	--	**119**	--	--	**368**	--	--
YVD-10	YVD-092617-31	9/26/2017	N	K1710381	0.100	U	--	0.500	U	--	--	--	--	**0.011**	--	--	--	--	--	--	--	--	**2.56**	--	--	**111**	--	--	**265**	--	--
YVD-10	YVD-120517-30	12/5/2017	N	K1713091	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.023**	--	--	--	--	--	--	--	--	**2.37**	--	--	**114**	--	--	**224**	--	--
YVD-10	YVD-031818-06	3/18/2018	N	870610	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.60**	--	--	**123**	--	--	**202**	--	--
YVD-10	YVD-060318-06	6/3/2018	N	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.93**	--	--	**118**	--	--	**208**	--	--
YVD-10	YVD-090918-13	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.58**	--	--	**114**	--	--	**238**	--	--
YVD-10	YVD-121018-08	12/10/2018	N	884857	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.64**	--	--	**112**	--	--	**196**	--	--
YVD-10	YVD-031819-16	3/18/2019	N	988273	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	**0.070**	--	--	**2.62**	--	--	**108**	--	--	**196**	--	--
YVD-10	YVD-060319-18	6/3/2019	N	992053	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.56**	--	--	**106**	--	--	**220**	--	--
YVD-10	YVD-091019-20	9/10/2019	N	998438	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.49**	--	--	**104**	--	--	**165**	--	--
YVD-10	YVD-121019-21	12/10/2019	N	902321	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.94**	--	--	**102**	--	--	**199**	--	--
YVD-10	YVD-033020-08	3/30/2020	N	006241	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.64**	--	--	**100**	--	--	**183**	--	--
YVD-10	YVD-060920-12	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.71**	--	--	**108**	--	--	**224**	--	--
YVD-10	YVD-092020-08	9/20/2020	N	013864	0.050	U	--	0.500	U	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.73**	--	--	**102**	--	--	**229**	--	--
YVD-10	YVD-120720-12	12/7/2020	N	017035	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.24**	--	--	**106**	--	--	**288**	--	--
YVD-10	YVD-030121-12	3/1/2021	N	119931	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.34**	--	--	**134**	--	--	**896**	--	--
YVD-10	YVD-060621-07	6/6/2021	N	124053	0.050	U	--	5.00	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.80**	--	--	**106**	--	--	**219**	--	--
YVD-10	YVD-121421-06	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-10	YVD-031422-06	3/14/2022	N	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-10	YVD-060522-06	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-10	YVD-091422-20	9/14/2022	N	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-10	YVD-120722-11	12/7/2022	N	K2214479	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-10	YVD-030623-10	3/6/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-10	YVD-062123-26	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-10	YVD-091023-03	9/10/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-10	YVD-091023-05	9/10/2023	FD	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-10	YVD-120623-05	12/6/2023	N	K2313796	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-11	YVD-11-130923	09/23/2013	N	SWI0178	--	--	--	0.250	U	--	--	--	--	--	--	--	0.100	UJ	FDP	--	--	--	**5.44**	J	FDP	**23.2**	--	--	--	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-11	YVD-D2-130923	09/23/2013	FD	SWI0178	--	--	--	0.250	U	--	--	--	--	--	--	--	**0.753**	J	FDP	--	--	--	**3.60**	J	FDP	**23.0**	--	--	--	--	--
YVD-11	YVD-11-130926	09/26/2013	N	SWI0190	2.00	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**207**	--	--
YVD-11	YVD-D3-130926	09/26/2013	FD	SWI0190	2.00	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**228**	--	--
YVD-11	YVD-11-131212	12/12/2013	N	SWL0073	2.00	U	--	0.200	UJ	MSD	--	--	--	--	--	--	--	--	--	**0.245**	--	--	**3.37**	--	--	**23.2**	--	--	**208**	--	--
YVD-11	YVD-11-140318	03/18/2014	N	SXC0107	2.00	U	--	**0.503**	J-	MSD	**0.170**	--	--	--	--	--	--	--	--	--	--	--	**3.15**	--	--	**22.2**	--	--	**193**	--	--
YVD-11	YVD-11-140603	06/03/2014	N	SXF0017	2.00	U	--	**0.564**	--	--	**0.840**	--	--	--	--	--	--	--	--	--	--	--	**5.38**	--	--	**26.1**	--	--	**203**	J-	MSD
YVD-11	YVD-11-140924	09/24/2014	N	SXI0173	1.00	U	--	**0.453**	J+	MSD	**0.170**	J+	FBK	--	--	--	--	--	--	--	--	--	**3.86**	--	--	**25.6**	--	--	**159**	--	--
YVD-11	YVD-11-141217	12/17/2014	N	SXL0121	2.00	U	--	0.250	UJ	MSD	**0.460**	--	--	--	--	--	--	--	--	--	--	--	**4.77**	--	--	**25.6**	--	--	**158**	--	--
YVD-11	YVD-11-150317	03/17/2015	N	5904651	2.00	U	--	0.250	UJ	MSD	**0.300**	--	--	--	--	--	--	--	--	--	--	--	**4.30**	J-	MSD	**26.0**	--	--	**150**	--	--
YVD-11	YVD-11-150616	06/16/2015	N	59010961	2.00	U	--	**0.310**	J-	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.20**	J+	MSD	**27.0**	J+	MSD	**140**	--	--
YVD-11	YVD-11-150923	09/23/2015	N	59020281	2.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.40**	--	--	**25.0**	--	--	**130**	--	--
YVD-11	YVD-11-151215	12/15/2015	N	59025431	2.00	U	--	--	R	MSD	**0.590**	J	FDP	--	--	--	--	--	--	--	--	--	**5.20**	--	--	**25.0**	--	--	**140**	--	--
YVD-11	YVD-D2-151215	12/15/2015	FD	59025431	0.200	U	--	--	R	MSD	**1.50**	J	FDP	--	--	--	--	--	--	--	--	--	**4.90**	--	--	**25.0**	--	--	**130**	--	--
YVD-11	YVD-11-160309	03/09/2016	N	59029711	2.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.30**	--	--	**25.0**	--	--	**140**	J+	MSD
YVD-11	YVD-11-160621	6/21/2016	N	59037151	2.00	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.50**	--	--	**27.0**	--	--	**130**	--	--
YVD-11	YVD-11-160927	9/27/2016	N	K1611629	0.100	U	--	0.500	U	--	--	--	--	**0.071**	--	--	--	--	--	--	--	--	**3.13**	--	--	**26.1**	--	--	**100**	--	--
YVD-11	YVD-11-161214	12/14/2016	N	K1615126	0.100	U	--	0.500	U	--	--	--	--	**0.421**	--	--	--	--	--	--	--	--	**4.82**	--	--	**25.6**	--	--	**104**	--	--
YVD-11	YVD-031317-37	3/13/2017	N	K1702489	**0.060**	J	--	0.500	U	--	--	--	--	**0.016**	--	--	--	--	--	--	--	--	**3.02**	--	--	**25.5**	--	--	**99.8**	--	--
YVD-11	YVD-060517-10	6/5/2017	N	K1705702	0.100	U	--	0.500	U	--	--	--	--	**0.029**	--	--	--	--	--	--	--	--	**2.98**	--	--	**24.9**	--	--	**133**	--	--
YVD-11	YVD-092617-26	9/26/2017	N	K1710381	0.100	UJ	HTQ	0.500	U	--	--	--	--	**0.006**	J	--	--	--	--	--	--	--	**3.24**	--	--	**28.8**	--	--	**219**	--	--
YVD-11	YVD-120417-06	12/4/2017	N	K1713026	0.100	U	--	0.500	U	--	--	--	--	0.015	U	MBK	--	--	--	--	--	--	**2.78**	--	--	**25.8**	--	--	**124**	--	--
YVD-11	YVD-031918-12	3/19/2018	N	870634	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.98**	--	--	**26.0**	--	--	**103**	--	--
YVD-11	YVD-031918-14	3/19/2018	FD	870634	0.050	U	--	--	--	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.94**	--	--	**25.8**	--	--	**100**	--	--
YVD-11	YVD-060418-14	6/4/2018	N	874662	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.26**	--	--	**28.4**	--	--	**91.2**	--	--
YVD-11	YVD-060418-16	6/4/2018	FD	874662	0.050	U	--	**0.600**	J	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.28**	--	--	**28.9**	--	--	**90.0**	--	--
YVD-11	YVD-090918-05	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.05**	--	--	**28.2**	--	--	**90.6**	--	--
YVD-11	YVD-121018-10	12/10/2018	N	884857	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.88**	--	--	**27.4**	--	--	**75.4**	--	--
YVD-11	YVD-031819-18	3/18/2019	N	988273	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.76**	--	--	**26.2**	--	--	**60.4**	--	--
YVD-11	YVD-060219-02	6/2/2019	N	991939	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.60**	--	--	**25.4**	--	--	**58.2**	--	--
YVD-11	YVD-060219-04	6/2/2019	FD	991939	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.68**	--	--	**25.6**	--	--	**58.4**	--	--
YVD-11	YVD-090919-05	9/9/2019	N	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.66**	--	--	**27.2**	--	--	**60.4**	--	--
YVD-11	YVD-120919-13	12/9/2019	N	902276	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.76**	--	--	**29.6**	J	MSD	**57.2**	--	--
YVD-11	YVD-033020-10	3/30/2020	N	006241	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.68**	--	--	**29.8**	--	--	**55.5**	--	--
YVD-11	YVD-061020-31	6/10/2020	N	009361	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.64**	--	--	**31.0**	--	--	**48.8**	--	--
YVD-11	YVD-092120-20	9/21/2020	N	013896	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.70**	--	--	**33.4**	--	--	**60.3**	--	--
YVD-11	YVD-120720-10	12/7/2020	N	017035	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.05**	--	--	**36.4**	--	--	**52.8**	--	--
YVD-11	YVD-030121-06	3/1/2021	N	119931	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.94**	--	--	**37.6**	--	--	**56.0**	--	--
YVD-11	YVD-060821-23	6/8/2021	N	124212	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.80**	--	--	**35.6**	--	--	**36.0**	--	--
YVD-11	YVD-121421-05	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-11	YVD-031522-19	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-11	YVD-060622-18	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-11	YVD-091422-21	9/14/2022	N	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-11	YVD-120622-06	12/6/2022	N	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-11	YVD-030623-21	3/6/2023	N	K2302728	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-11	YVD-062123-24	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-11	YVD-091123-11	9/11/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-11	YVD-120723-01	12/7/2023	N	K2313796	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-12	YVD-12-130919	09/19/2013	N	SWI0142	--	--	--	--	R	FBK	--	--	--	--	--	--	**0.356**	J+	FBK	--	--	--	**3.14**	--	--	**77.3**	--	--	**245**	--	--
YVD-12	YVD-12-130925	09/25/2013	N	SWI0175	2.00	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-12	YVD-12-131211	12/11/2013	N	SWL0073	2.00	U	--	--	R	MSD, FBK	--	--	--	--	--	--	--	--	--	**0.218**	--	--	**3.63**	--	--	**73.2**	--	--	**262**	--	--
YVD-12	YVD-12-140318	03/18/2014	N	SXC0095	2.00	U	--	**0.564**	--	--	**0.220**	--	--	--	--	--	--	--	--	--	--	--	**3.27**	--	--	**73.4**	--	--	**236**	J-	MSD
YVD-12	YVD-12-140603	06/03/2014	N	SXF0017	0.200	U	--	**0.415**	--	--	**0.280**	J+	FBK	--	--	--	--	--	--	--	--	--	**2.96**	--	--	**70.7**	--	--	**21.3**	J-	MSD
YVD-12	YVD-12-140922	09/22/2014	N	SXI0148	2.00	U	--	**0.669**	--	--	**0.250**	--	--	--	--	--	--	--	--	--	--	--	**3.13**	--	--	**77.9**	--	--	**200**	--	--
YVD-12	YVD-D2-140922	09/22/2014	FD	SXI0148	0.800	U	--	**0.653**	--	--	**0.200**	--	--	--	--	--	--	--	--	--	--	--	**3.00**	--	--	**77.8**	--	--	**200**	--	--
YVD-12	YVD-12-141216	12/16/2014	N	SXL0121	2.00	U	--	0.250	UJ	MSD	**0.250**	--	--	--	--	--	--	--	--	--	--	--	**3.23**	--	--	**71.8**	--	--	**228**	--	--
YVD-12	YVD-12-150317	03/17/2015	N	5904541	2.00	U	--	**0.560**	J-	MSD	**0.310**	--	--	--	--	--	--	--	--	--	--	--	**3.60**	--	--	**73.0**	--	--	**190**	J-	MSD
YVD-12	YVD-12-150617	06/17/2015	N	59010961	2.00	U	--	**0.350**	J-	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.60**	J+	MSD	**83.0**	J+	MSD	**180**	--	--
YVD-12	YVD-12-150924	09/24/2015	N	59020391	2.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.50**	--	--	**73.0**	--	--	**210**	J-	MSD
YVD-12	YVD-12-151216	12/16/2015	N	59025501	2.00	U	--	**0.580**	J-	MSD	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**3.10**	--	--	**74.0**	--	--	**180**	--	--
YVD-12	YVD-12-160309	03/09/2016	N	59029941	2.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.60**	--	--	**73.0**	--	--	**170**	J	DUP
YVD-12	YVD-D3-160309	03/09/2016	FD	59029941	0.200	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.50**	--	--	**72.0**	--	--	**180**	J	DUP
YVD-12	YVD-12-160622	6/22/2016	N	59037271	2.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**2.90**	--	--	**72.0**	--	--	**180**	--	--
YVD-12	YVD-12-160929	9/29/2016	N	K1611704	0.100	U	--	0.500	U	--	--	--	--	**0.026**	--	--	--	--	--	--	--	--	**2.28**	--	--	**67.7**	--	--	**158**	--	--
YVD-12	YVD-12-161213	12/13/2016	N	K1615083	0.100	U	--	0.500	U	--	--	--	--	**0.018**	--	--	--	--	--	--	--	--	**2.29**	--	--	**67.9**	--	--	**150**	--	--
YVD-12	YVD-030917-20	3/9/2017	N	K1702404	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.008**	J	--	--	--	--	--	--	--	**2.27**	--	--	**67.4**	--	--	**227**	--	--
YVD-12	YVD-060617-25	6/6/2017	N	K1705833	0.100	U	--	0.500	U	--	--	--	--	**0.010**	J	--	--	--	--	--	--	--	**2.24**	--	--	**66.5**	--	--	**155**	--	--
YVD-12	YVD-092517-15	9/25/2017	N	K1710333	0.100	U	--	0.500	U	--	--	--	--	0.010	U	--	--	--	--	--	--	--	**2.27**	--	--	**64.4**	--	--	**177**	--	--
YVD-12	YVD-120417-03	12/4/2017	N	K1713026	0.100	U	--	0.500	U	--	--	--	--	0.013	U	MBK	--	--	--	--	--	--	**2.06**	--	--	**70.8**	--	--	**169**	--	--
YVD-12	YVD-031918-13	3/19/2018	N	870610	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.30**	--	--	**70.5**	--	--	**167**	--	--
YVD-12	YVD-060318-11	6/3/2018	N	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.58**	--	--	**68.0**	--	--	**171**	--	--
YVD-12	YVD-090918-16	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.52**	--	--	**67.0**	--	--	**180**	--	--
YVD-12	YVD-121018-13	12/10/2018	N	884857	0.050	U	--	10.0	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.52**	--	--	**69.5**	--	--	**170**	--	--
YVD-12	YVD-031719-07	3/17/2019	N	988239	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.46**	--	--	**70.5**	--	--	**188**	--	--
YVD-12	YVD-060319-27	6/3/2019	N	992053	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.40**	--	--	**66.5**	--	--	**188**	--	--
YVD-12	YVD-090919-16	9/9/2019	N	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.48**	--	--	**60.5**	--	--	**172**	--	--
YVD-12	YVD-120919-12	12/9/2019	N	902276	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.48**	--	--	**67.0**	J	MSD	**176**	--	--
YVD-12	YVD-033020-11	3/30/2020	N	006241	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.44**	--	--	**63.0**	--	--	**170**	--	--
YVD-12	YVD-060920-22	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.50**	--	--	**71.5**	--	--	**179**	--	--
YVD-12	YVD-092120-18	9/21/2020	N	013896	0.050	U	--	2.50	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.38**	--	--	**60.5**	--	--	**168**	--	--
YVD-12	YVD-120820-19	12/8/2020	N	017137	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.59**	--	--	**62.0**	--	--	**174**	--	--
YVD-12	YVD-030221-19	3/2/2021	N	120034	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.44**	--	--	**59.5**	--	--	**168**	--	--
YVD-12	YVD-060821-25	6/8/2021	N	124212	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**2.41**	--	--	**60.0**	--	--	**176**	--	--
YVD-12	YVD-121521-18	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-12	YVD-031522-21	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-12	YVD-060622-20	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-12	YVD-091322-09	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-12	YVD-120822-16	12/8/2022	N	K2214578	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-12	YVD-030523-02	3/5/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-12	YVD-062123-31	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-12	YVD-091123-19	9/11/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-12	YVD-120323-01	12/3/2023	N	K2313548	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-13	YVD-13-130919	09/19/2013	N	SWI0138	2.00	U	--	--	R	FBK	--	--	--	--	--	--	--	R	FBK	--	--	--	**4.30**	--	--	**114**	--	--	**365**	--	--
YVD-13	YVD-13-131211	12/11/2013	N	SWL0073	2.00	U	--	0.200	UJ	MSD	--	--	--	--	--	--	--	--	--	**0.110**	--	--	**4.16**	--	--	**110**	--	--	**278**	--	--
YVD-13	YVD-13-140318	03/18/2014	N	SXC0095	2.00	U	--	**0.613**	--	--	**0.170**	--	--	--	--	--	--	--	--	--	--	--	**4.27**	--	--	**106**	--	--	**312**	J-	MSD
YVD-13	YVD-13-140603	06/03/2014	N	SXF0017	0.800	U	--	**0.727**	--	--	**0.078**	J+	FBK	--	--	--	--	--	--	--	--	--	**3.70**	--	--	**113**	--	--	**151**	J-	MSD
YVD-13	YVD-13-140923	09/23/2014	N	SXI0173	2.00	U	--	**9.13**	J+	MSD	0.050	U	--	--	--	--	--	--	--	--	--	--	**4.40**	--	--	**118**	--	--	**328**	--	--
YVD-13	YVD-13-141217	12/17/2014	N	SXL0121	2.00	U	--	0.250	UJ	MSD	0.100	U	--	--	--	--	--	--	--	--	--	--	**4.74**	--	--	**119**	--	--	**355**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-13	YVD-13-150317	03/17/2015	N	5904541	2.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.00**	--	--	**120**	--	--	**290**	J-	MSD
YVD-13	YVD-13-150617	06/17/2015	N	59010961	2.00	U	--	**0.680**	J-	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.40**	J+	MSD	**120**	J+	MSD	**310**	--	--
YVD-13	YVD-13-150924	09/24/2015	N	59020391	2.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.10**	--	--	**110**	--	--	**330**	J-	MSD
YVD-13	YVD-13-151216	12/16/2015	N	59025501	2.00	U	--	--	R	MSD	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**4.30**	--	--	**120**	--	--	**310**	--	--
YVD-13	YVD-13-160309	03/09/2016	N	59029941	2.00	U	--	0.250	UJ	FDP, MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.20**	--	--	**120**	--	--	**390**	J	DUP
YVD-13	YVD-13-160622	6/22/2016	N	59037271	2.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.20**	--	--	**120**	--	--	**390**	--	--
YVD-13	YVD-13-160928	9/28/2016	N	K1611698	0.100	U	--	--	R	MSD	--	--	--	**0.014**	--	--	--	--	--	--	--	--	**3.91**	--	--	**113**	--	--	**321**	--	--
YVD-13	YVD-13-161214	12/13/2016	N	K1615083	0.100	U	--	0.500	U	--	--	--	--	**0.047**	--	--	--	--	--	--	--	--	**4.02**	--	--	**111**	--	--	**313**	--	--
YVD-13	YVD-030717-08	3/7/2017	N	K1702324	**0.050**	J	HTQ	0.500	U	--	--	--	--	**0.010**	J	--	--	--	--	--	--	--	**3.63**	--	--	**105**	--	--	**277**	--	--
YVD-13	YVD-030717-10	3/7/2017	FD	K1702324	**0.040**	J	HTQ	0.500	U	--	--	--	--	**0.009**	J	--	--	--	--	--	--	--	**3.71**	--	--	**107**	--	--	**280**	--	--
YVD-13	YVD-060717-33	6/7/2017	N	K1705833	0.100	U	--	0.500	U	--	--	--	--	**0.014**	--	--	--	--	--	--	--	--	**3.83**	--	--	**114**	--	--	**282**	--	--
YVD-13	YVD-092617-25	9/26/2017	N	K1710333	0.100	U	--	0.500	U	--	--	--	--	0.010	U	--	--	--	--	--	--	--	**3.66**	--	--	**105**	--	--	**298**	--	--
YVD-13	YVD-120417-07	12/4/2017	N	K1713026	0.100	U	--	0.500	U	--	--	--	--	0.015	U	MBK	--	--	--	--	--	--	**3.41**	--	--	**102**	--	--	**271**	--	--
YVD-13	YVD-031918-19	3/19/2018	N	870634	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.82**	--	--	**102**	--	--	**249**	--	--
YVD-13	YVD-060318-09	6/3/2018	N	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.01**	--	--	**108**	--	--	**235**	--	--
YVD-13	YVD-090918-14	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.90**	--	--	**104**	--	--	**222**	--	--
YVD-13	YVD-121018-11	12/10/2018	N	884857	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.95**	--	--	**104**	--	--	**225**	--	--
YVD-13	YVD-031819-15	3/18/2019	N	988273	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.04**	--	--	**105**	--	--	**223**	--	--
YVD-13	YVD-060319-25	6/3/2019	N	992053	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.87**	--	--	**103**	--	--	**201**	--	--
YVD-13	YVD-090919-10	9/9/2019	N	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.95**	--	--	**95.0**	--	--	**197**	--	--
YVD-13	YVD-120919-10	12/9/2019	N	902276	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.90**	--	--	**102**	J	MSD	**191**	--	--
YVD-13	YVD-033020-09	3/30/2020	N	006241	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.92**	--	--	**100**	--	--	**200**	--	--
YVD-13	YVD-060920-21	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.97**	--	--	**106**	--	--	**176**	--	--
YVD-13	YVD-092120-13	9/21/2020	N	013896	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.04**	--	--	**103**	--	--	**198**	--	--
YVD-13	YVD-120820-17	12/8/2020	N	017137	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.16**	--	--	**102**	--	--	**166**	--	--
YVD-13	YVD-030221-15	3/2/2021	N	120034	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.96**	--	--	**101**	--	--	**195**	--	--
YVD-13	YVD-060821-32	6/8/2021	N	124212	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.96**	--	--	**100**	--	--	**196**	--	--
YVD-13	YVD-121521-16	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-13	YVD-031522-20	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-13	YVD-060722-24	6/7/2022	N	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-13	YVD-091322-11	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-13	YVD-122722-18	12/27/2022	N	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-13	YVD-030623-08	3/6/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-13	YVD-030623-09	3/6/2023	FD	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-13	YVD-062023-14	6/20/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-13	YVD-091123-21	9/11/2023	N	K2310209	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-13	YVD-120423-09	12/4/2023	N	K2313657	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-14	YVD-14-130918	09/18/2013	N	SWI0123	2.00	U	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	**3.45**	--	--	**110**	--	--	**213**	--	--
YVD-14	YVD-14-131212	12/12/2013	N	SWL0078	2.00	U	--	0.796	U	ERL	--	--	--	--	--	--	--	--	--	0.060	U	--	**3.29**	--	--	**108**	--	--	**186**	--	--
YVD-14	YVD-14-140319	03/19/2014	N	SXC0107	2.00	U	--	**0.562**	J-	MSD	0.050	U	--	--	--	--	--	--	--	--	--	--	**3.37**	--	--	**102**	--	--	**190**	--	--
YVD-14	YVD-14-140604	06/04/2014	N	SXF0025	2.00	U	--	0.250	UJ	MSD	**0.078**	--	--	--	--	--	--	--	--	--	--	--	**3.46**	--	--	**112**	--	--	**191**	--	--
YVD-14	YVD-14-140924	09/24/2014	N	SXI0173	2.00	U	--	0.250	U	--	**0.087**	J+	FBK	--	--	--	--	--	--	--	--	--	**4.10**	--	--	**124**	--	--	**178**	--	--
YVD-14	YVD-14-141217	12/17/2014	N	SXL0121	2.00	U	--	0.250	UJ	MSD	0.100	U	--	--	--	--	--	--	--	--	--	--	**3.83**	--	--	**113**	--	--	**185**	--	--
YVD-14	YVD-14-150318	03/18/2015	N	5904651	2.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.60**	J-	MSD	**130**	--	--	**180**	--	--
YVD-14R	YVD-14R-151216	12/16/2015	N	59025501	2.00	U	--	--	R	MSD	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**4.40**	--	--	**120**	--	--	**160**	--	--
YVD-14R	YVD-14R-160309	03/09/2016	N	59029941	2.00	U	--	0.250	UJ	FDP, MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.40**	--	--	**130**	--	--	**180**	J	DUP
YVD-14R	YVD-14R-160622	6/22/2016	N	59037271	2.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.30**	--	--	**130**	--	--	**150**	--	--
YVD-14R	YVD-14R-160928	9/28/2016	N	K1611698	0.100	U	--	--	R	MSD	--	--	--	**0.015**	--	--	--	--	--	--	--	--	**4.05**	--	--	**126**	--	--	**140**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-14R	YVD-14R-161212	12/12/2016	N	K1615029	0.100	UJ	HTQ	0.500	U	--	--	--	--	**0.058**	--	--	--	--	--	--	--	--	**4.09**	--	--	**119**	--	--	**158**	--	--
YVD-14R	YVD-D1-161212	12/12/2016	FD	K1615029	0.100	UJ	HTQ	0.500	U	--	--	--	--	**0.092**	--	--	--	--	--	--	--	--	**4.17**	--	--	**121**	--	--	**155**	--	--
YVD-14R	YVD-030917-19	3/9/2017	N	K1702404	0.100	U	--	0.500	U	--	--	--	--	**0.020**	--	--	--	--	--	--	--	--	**3.80**	--	--	**117**	--	--	**147**	--	--
YVD-14R	YVD-030917-21	3/9/2017	FD	K1702404	0.100	U	--	0.500	U	--	--	--	--	**0.019**	--	--	--	--	--	--	--	--	**3.75**	--	--	**115**	--	--	**151**	--	--
YVD-14R	YVD-060517-06	6/5/2017	N	K1705702	0.100	U	--	0.500	U	--	--	--	--	**0.038**	--	--	--	--	--	--	--	--	**3.53**	--	--	**110**	--	--	**142**	--	--
YVD-14R	YVD-092517-14	9/25/2017	N	K1710333	0.100	U	--	0.500	U	--	--	--	--	**0.018**	--	--	--	--	--	--	--	--	**3.85**	--	--	**121**	--	--	**138**	--	--
YVD-14R	YVD-120417-12	12/4/2017	N	K1713026	0.100	U	--	0.500	U	--	--	--	--	**0.024**	--	--	--	--	--	--	--	--	**3.54**	--	--	**116**	--	--	**124**	--	--
YVD-14R	YVD-031818-11	3/18/2018	N	870610	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.96**	--	--	**127**	--	--	**128**	--	--
YVD-14R	YVD-060318-04	6/3/2018	N	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.18**	--	--	**130**	--	--	**123**	--	--
YVD-14R	YVD-090918-09	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.09**	--	--	**130**	--	--	**125**	--	--
YVD-14R	YVD-121018-02	12/10/2018	N	884857	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.39**	--	--	**131**	--	--	**139**	--	--
YVD-14R	YVD-121018-04	12/10/2018	FD	884857	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.36**	--	--	**131**	--	--	**136**	--	--
YVD-14R	YVD-031819-12	3/18/2019	N	988273	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.56**	--	--	**136**	--	--	**147**	--	--
YVD-14R	YVD-031819-14	3/18/2019	FD	988273	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.57**	--	--	**136**	--	--	**145**	--	--
YVD-14R	YVD-060319-22	6/3/2019	N	992053	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.42**	--	--	**136**	--	--	**145**	--	--
YVD-14R	YVD-060319-24	6/3/2019	FD	992053	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.38**	--	--	**132**	--	--	**131**	--	--
YVD-14R	YVD-090919-13	9/9/2019	N	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.48**	--	--	**129**	--	--	**133**	--	--
YVD-14R	YVD-121019-15	12/10/2019	N	902321	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.71**	--	--	**128**	--	--	**123**	--	--
YVD-14R	YVD-121019-17	12/10/2019	FD	902321	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.75**	--	--	**128**	--	--	**124**	--	--
YVD-14R	YVD-033020-02	3/30/2020	N	006241	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.20**	--	--	**134**	--	--	**125**	--	--
YVD-14R	YVD-033020-04	3/30/2020	FD	006241	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.34**	--	--	**134**	--	--	**123**	--	--
YVD-14R	YVD-060920-20	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.44**	--	--	**152**	--	--	**132**	--	--
YVD-14R	YVD-092120-14	9/21/2020	N	013896	0.050	U	--	2.50	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.31**	--	--	**144**	--	--	**124**	--	--
YVD-14R	YVD-120820-20	12/8/2020	N	017137	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.60**	--	--	**144**	--	--	**129**	--	--
YVD-14R	YVD-030121-08	3/1/2021	N	119931	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.59**	--	--	**147**	--	--	**122**	--	--
YVD-14R	YVD-060621-09	6/6/2021	N	124053	0.050	U	--	5.00	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.71**	--	--	**146**	--	--	**114**	--	--
YVD-14R	YVD-121421-08	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-14R	YVD-031422-07	3/14/2022	N	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-14R	YVD-060522-09	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-14R	YVD-091422-15	9/14/2022	N	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-14R	YVD-120822-13	12/8/2022	N	K2214578	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-14R	YVD-120822-14	12/8/2022	FD	K2214578	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-14R	YVD-030523-03	3/5/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-14R	YVD-062123-29	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-14R	YVD-091123-12	9/11/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-14R	YVD-120423-15	12/4/2023	N	K2313657	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-15	YVD-15-130917	09/17/2013	N	SWI0123	2.00	U	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	**2.73**	--	--	**127**	--	--	**51.5**	--	--
YVD-15	YVD-15-131212	12/12/2013	N	SWL0078	2.00	U	--	0.200	U	--	--	--	--	--	--	--	--	--	--	**0.238**	--	--	**4.48**	--	--	**114**	--	--	**114**	--	--
YVD-15	YVD-15-140319	03/19/2014	N	SXC0107	2.00	U	--	**0.553**	J-	MSD	**0.220**	--	--	--	--	--	--	--	--	--	--	--	**5.23**	--	--	**93.5**	--	--	**44.7**	--	--
YVD-15	YVD-15-140603	06/03/2014	N	SXF0025	2.00	U	--	**0.475**	J-	MSD	**0.310**	--	--	--	--	--	--	--	--	--	--	--	**5.20**	--	--	**110**	--	--	**39.0**	--	--
YVD-15	YVD-15-140924	09/24/2014	N	SXI0173	2.00	U	--	**1.19**	J+	MSD	**0.072**	J+	FBK	--	--	--	--	--	--	--	--	--	**3.11**	--	--	**135**	--	--	**50.7**	--	--
YVD-15	YVD-15-141217	12/17/2014	N	SXL0121	2.00	U	--	**0.414**	J-	MSD	**0.170**	--	--	--	--	--	--	--	--	--	--	--	**3.67**	--	--	**60.3**	--	--	**53.4**	--	--
YVD-15	YVD-15-150317	03/17/2015	N	5904651	2.00	U	--	0.250	UJ	MSD	**0.270**	--	--	--	--	--	--	--	--	--	--	--	**8.40**	J-	MSD	**160**	--	--	**53.0**	--	--
YVD-15	YVD-15-150617	06/17/2015	N	59011021	0.200	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.60**	J	RPD	**110**	J	RPD	**59.0**	--	--
YVD-15	YVD-15-150925	09/25/2015	N	59020431	2.00	U	--	2.50	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.90**	--	--	**80.0**	--	--	**47.0**	--	--
YVD-15	YVD-15-151215	12/15/2015	N	59025431	2.00	U	--	--	R	MSD	0.250	UJ	FDP	--	--	--	--	--	--	--	--	--	**4.10**	--	--	**80.0**	--	--	**40.0**	--	--
YVD-15	YVD-15-160309	03/09/2016	N	59029711	2.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.20**	--	--	**75.0**	--	--	**65.0**	J+	MSD
YVD-15	YVD-15-160621	6/21/2016	N	59037271	2.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.50**	--	--	**74.0**	--	--	**86.0**	--	--
YVD-15	YVD-15-160928	9/28/2016	N	K1611629	0.100	U	--	0.500	U	--	--	--	--	**0.023**	--	--	--	--	--	--	--	--	**3.15**	--	--	**66.2**	--	--	**108**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-15	YVD-15-161215	12/15/2016	N	K1615126	0.100	U	--	0.500	U	--	--	--	--	**0.095**	--	--	--	--	--	--	--	--	**3.40**	--	--	**59.1**	--	--	**108**	--	--
YVD-15	YVD-030917-23	3/9/2017	N	K1702404	0.100	U	--	0.500	U	--	--	--	--	**0.011**	--	--	--	--	--	--	--	--	**2.95**	--	--	**55.3**	--	--	**125**	--	--
YVD-15	YVD-060617-20	6/6/2017	N	K1705754	0.100	U	--	0.500	U	--	--	--	--	**0.017**	--	--	--	--	--	--	--	--	**2.98**	--	--	**62.9**	--	--	**143**	--	--
YVD-15	YVD-092517-10	9/25/2017	N	K1710333	0.100	U	--	0.500	U	--	--	--	--	0.010	U	--	--	--	--	--	--	--	**3.21**	--	--	**74.5**	--	--	**167**	--	--
YVD-15	YVD-120517-28	12/5/2017	N	K1713091	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.013**	--	--	--	--	--	--	--	--	**2.89**	--	--	**78.6**	--	--	**145**	--	--
YVD-15	YVD-031818-09	3/18/2018	N	870610	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.25**	--	--	**94.5**	--	--	**129**	--	--
YVD-15	YVD-060318-08	6/3/2018	N	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.36**	--	--	**97.5**	--	--	**118**	--	--
YVD-15	YVD-090918-11	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.18**	--	--	**99.0**	--	--	**110**	--	--
YVD-15	YVD-121018-06	12/10/2018	N	884857	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.25**	--	--	**97.5**	--	--	**111**	--	--
YVD-15	YVD-031719-10	3/17/2019	N	988239	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.22**	--	--	**96.0**	--	--	**110**	--	--
YVD-15	YVD-060419-29	6/4/2019	N	992242	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.18**	--	--	**100**	--	--	**114**	--	--
YVD-15	YVD-090919-11	9/9/2019	N	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.14**	--	--	**92.0**	--	--	**103**	--	--
YVD-15	YVD-121019-19	12/10/2019	N	902321	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.40**	--	--	**91.5**	--	--	**96.9**	--	--
YVD-15	YVD-033020-06	3/30/2020	N	006241	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.12**	--	--	**90.0**	--	--	**90.9**	--	--
YVD-15	YVD-060920-16	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.08**	--	--	**96.0**	--	--	**87.7**	--	--
YVD-15	YVD-092020-09	9/20/2020	N	013864	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.12**	--	--	**89.5**	--	--	**90.0**	--	--
YVD-15	YVD-120720-14	12/7/2020	N	017035	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.35**	--	--	**89.0**	--	--	**89.0**	--	--
YVD-15	YVD-030121-14	3/1/2021	N	119931	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.15**	--	--	**85.5**	--	--	**86.9**	--	--
YVD-15	YVD-060621-08	6/6/2021	N	124053	0.050	U	--	5.00	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.32**	--	--	**86.5**	--	--	**72.0**	--	--
YVD-15	YVD-121421-07	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-15	YVD-031422-05	3/14/2022	N	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-15	YVD-060522-07	6/5/2022	N	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-15	YVD-091422-19	9/14/2022	N	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-15	YVD-120622-07	12/6/2022	N	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-15	YVD-030523-04	3/5/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-15	YVD-062123-25	6/21/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-15	YVD-091123-20	9/11/2023	N	K2310209	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-15	YVD-120623-01	12/6/2023	N	K2313796	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-15	YVD-120623-02	12/6/2023	FD	K2313796	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-16	YVD-16-130923	09/23/2013	N	SWI0178	--	--	--	**0.375**	--	--	--	--	--	--	--	--	0.100	U	--	--	--	--	**6.16**	--	--	**81.7**	--	--	--	--	--
YVD-16	YVD-16-130926	09/26/2013	N	SWI0190	2.00	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**140**	--	--
YVD-16	YVD-16-131212	12/12/2013	N	SWL0073	2.00	U	--	0.200	UJ	MSD	--	--	--	--	--	--	--	--	--	0.060	U	--	**5.25**	--	--	**79.8**	--	--	**163**	--	--
YVD-16	YVD-16-140318	03/18/2014	N	SXC0107	2.00	U	--	**1.01**	J-	MSD	**1.40**	--	--	--	--	--	--	--	--	--	--	--	**15.0**	--	--	**75.5**	--	--	**130**	--	--
YVD-16	YVD-16-140603	06/03/2014	N	SXF0017	0.800	U	--	**0.741**	--	--	**0.830**	--	--	--	--	--	--	--	--	--	--	--	**8.47**	--	--	**78.4**	--	--	**131**	J-	MSD
YVD-16	YVD-16-140923	09/23/2014	N	SXI0173	1.00	U	--	**0.747**	J+	MSD	**0.220**	--	--	--	--	--	--	--	--	--	--	--	**7.48**	--	--	**94.1**	--	--	**114**	--	--
YVD-16	YVD-16-141217	12/17/2014	N	SXL0121	1.00	U	--	0.250	UJ	MSD	**0.250**	J	FDP	--	--	--	--	--	--	--	--	--	**6.77**	--	--	**83.7**	--	--	**118**	--	--
YVD-16	YVD-D3-141217	12/17/2014	FD	SXL0121	0.200	U	--	**0.290**	J-	MSD	**0.100**	J	FDP	--	--	--	--	--	--	--	--	--	**6.27**	--	--	**81.7**	--	--	**130**	--	--
YVD-16	YVD-16-150317	03/17/2015	N	5904651	1.00	U	--	**0.290**	J-	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**6.10**	J-	MSD	**87.0**	--	--	**120**	--	--
YVD-16	YVD-16-150616	06/16/2015	N	59010961	1.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**6.20**	J+	MSD	**91.0**	J+	MSD	**120**	--	--
YVD-16	YVD-16-150923	09/23/2015	N	59020281	1.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**6.50**	--	--	**85.0**	--	--	**130**	--	--
YVD-16	YVD-16-151215	12/15/2015	N	59025431	1.00	U	--	--	R	MSD	0.250	UJ	FDP	--	--	--	--	--	--	--	--	--	**5.70**	--	--	**85.0**	--	--	**120**	--	--
YVD-16	YVD-16-160309	03/09/2016	N	59029711	1.00	U	--	--	R	MSD	**0.270**	--	--	--	--	--	--	--	--	--	--	--	**7.40**	--	--	**86.0**	--	--	**130**	J+	MSD
YVD-16	YVD-16-160621	6/21/2016	N	59037151	1.00	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**5.90**	--	--	**86.0**	--	--	**120**	--	--
YVD-16	YVD-D2-160621	6/21/2016	FD	59037151	0.200	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**6.00**	--	--	**88.0**	--	--	**120**	--	--
YVD-16	YVD-16-160928	9/28/2016	N	K1611629	0.100	U	--	0.500	U	--	--	--	--	**0.016**	--	--	--	--	--	--	--	--	**5.69**	--	--	**90.2**	--	--	**110**	--	--
YVD-16	YVD-16-161215	12/15/2016	N	K1615126	0.100	U	--	0.500	U	--	--	--	--	**0.068**	--	--	--	--	--	--	--	--	**5.59**	--	--	**82.5**	--	--	**112**	--	--
YVD-16	YVD-030917-22	3/9/2017	N	K1702404	0.100	U	--	0.500	U	--	--	--	--	**0.045**	--	--	--	--	--	--	--	--	**5.16**	--	--	**79.8**	--	--	**113**	--	--
YVD-16	YVD-060517-12	6/5/2017	N	K1705754	0.100	U	--	0.500	U	--	--	--	--	**0.021**	--	--	--	--	--	--	--	--	**5.08**	--	--	**83.0**	--	--	**117**	--	--
YVD-16	YVD-092617-28	9/26/2017	N	K1710381	0.100	U	--	0.500	U	--	--	--	--	**0.016**	--	--	--	--	--	--	--	--	**5.44**	--	--	**84.1**	--	--	**115**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-16	YVD-120517-22	12/5/2017	N	K1713091	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.048**	--	--	--	--	--	--	--	--	**5.17**	--	--	**80.1**	--	--	**110**	--	--
YVD-16	YVD-031918-16	3/19/2018	N	870634	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.25**	--	--	**79.0**	--	--	**106**	--	--
YVD-16	YVD-060318-10	6/3/2018	N	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.55**	--	--	**88.0**	--	--	**104**	--	--
YVD-16	YVD-090918-07	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.20**	--	--	**83.5**	--	--	**107**	--	--
YVD-16	YVD-121118-20	12/11/2018	N	884939	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.85**	--	--	**84.0**	--	--	**106**	--	--
YVD-16	YVD-031719-08	3/17/2019	N	988239	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.45**	--	--	**82.0**	--	--	**109**	--	--
YVD-16	YVD-060219-06	6/2/2019	N	991939	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.45**	--	--	**80.5**	--	--	**106**	--	--
YVD-16	YVD-090919-07	9/9/2019	N	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.30**	--	--	**77.0**	--	--	**107**	--	--
YVD-16	YVD-120919-11	12/9/2019	N	902276	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.35**	--	--	**79.5**	J	MSD	**106**	--	--
YVD-16	YVD-033120-16	3/31/2020	N	006260	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.35**	--	--	**82.0**	--	--	**107**	--	--
YVD-16	YVD-061020-30	6/10/2020	N	009361	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.20**	--	--	**79.0**	--	--	**106**	--	--
YVD-16	YVD-092020-06	9/20/2020	N	013864	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.45**	--	--	**81.0**	--	--	**112**	--	--
YVD-16	YVD-120720-08	12/7/2020	N	017035	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.95**	--	--	**84.0**	--	--	**112**	--	--
YVD-16	YVD-030121-02	3/1/2021	N	119931	0.050	U	--	2.50	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.25**	--	--	**78.0**	--	--	**113**	--	--
YVD-16	YVD-030121-04	3/1/2021	FD	119931	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.50**	--	--	**79.5**	--	--	**115**	--	--
YVD-16	YVD-060621-03	6/6/2021	N	124053	0.050	U	--	5.00	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**5.03**	--	--	**77.5**	--	--	**111**	--	--
YVD-16	YVD-121421-02	12/14/2021	N	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-16	YVD-121421-03	12/14/2021	FD	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-16	YVD-031522-17	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-16	YVD-060622-16	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-16	YVD-091322-08	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-16	YVD-120622-05	12/6/2022	N	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-16	YVD-030523-05	3/5/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-16	YVD-030523-06	3/5/2023	FD	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-16	YVD-062023-13	6/20/2023	N	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-16	YVD-091123-17	9/11/2023	N	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-16	YVD-120423-07	12/4/2023	N	K2313548	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-17	YVD-17-130919	09/19/2013	N	SWI0142	--	--	--	2.50	U	--	--	--	--	--	--	--	**3.64**	--	--	--	--	--	**8.32**	--	--	**12.2**	--	--	**6.48**	--	--
YVD-17	YVD-17-130924	09/24/2013	N	SWI0175	0.200	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-17	YVD-17-131210	12/10/2013	N	SWL0055	0.200	U	--	--	R	FBK, MSD	--	--	--	--	--	--	--	--	--	**1.61**	--	--	**5.25**	--	--	**7.89**	--	--	**6.64**	--	--
YVD-17	YVD-17-140316	03/16/2014	N	SXC0081	0.200	U	--	0.250	U	--	**0.300**	--	--	--	--	--	--	--	--	--	--	--	**1.73**	--	--	**6.09**	--	--	**6.42**	--	--
YVD-17	YVD-17-140601	06/01/2014	N	SXF0008	0.200	U	--	**0.287**	--	--	**0.520**	--	--	--	--	--	--	--	--	--	--	--	**2.22**	--	--	**8.71**	--	--	**5.74**	--	--
YVD-17	YVD-17-140922	09/22/2014	N	SXI0148	0.200	U	--	**0.293**	--	--	**0.360**	--	--	--	--	--	--	--	--	--	--	--	**2.91**	--	--	**9.92**	--	--	**5.08**	--	--
YVD-17	YVD-17-141215	12/15/2014	N	SXL0103	0.200	U	--	0.250	U	--	**0.190**	--	--	--	--	--	--	--	--	--	--	--	**1.84**	--	--	**9.15**	--	--	**6.01**	J+	MSD, DUP
YVD-17	YVD-17-150316	03/16/2015	N	5904471	0.200	U	--	0.250	UJ	MSD	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**1.40**	--	--	**6.30**	--	--	**5.70**	--	--
YVD-17	YVD-D1-150316	03/16/2015	FD	5904471	0.200	U	--	0.250	UJ	MSD	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**1.50**	--	--	**6.20**	--	--	**5.70**	--	--
YVD-17	YVD-17-150617	06/17/2015	N	59010961	0.200	U	--	0.250	UJ	MSD	**0.250**	--	--	--	--	--	--	--	--	--	--	--	**1.80**	J+	MSD	**8.70**	J+	MSD	**5.40**	--	--
YVD-17	YVD-17-150924	09/24/2015	N	59020391	**1.20**	--	--	0.250	UJ	MSD	**0.260**	--	--	--	--	--	--	--	--	--	--	--	**2.00**	--	--	**9.00**	--	--	**5.60**	J-	MSD
YVD-17	YVD-17-151216	12/16/2015	N	59025501	0.200	U	--	--	R	MSD	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**1.40**	--	--	**8.00**	--	--	**5.40**	--	--
YVD-17	YVD-17-160310	03/10/2016	N	59029941	0.200	U	--	0.250	UJ	FDP	0.250	U	--	--	--	--	--	--	--	--	--	--	**1.20**	--	--	**6.40**	--	--	**4.80**	J	DUP
YVD-17	YVD-17-160623	6/23/2016	N	59037371	0.200	U	--	0.250	U	--	0.250	U	--	--	--	--	--	--	--	--	--	--	**1.60**	--	--	**8.30**	--	--	**5.30**	--	--
YVD-17	YVD-17-160926	9/26/2016	N	K1611565	0.100	U	--	--	R	MSD	--	--	--	**0.095**	--	--	--	--	--	--	--	--	**1.59**	--	--	**8.30**	--	--	**7.90**	--	--
YVD-17	YVD-17-161215	12/15/2016	N	K1615174	0.100	U	--	0.500	U	--	--	--	--	**0.103**	--	--	--	--	--	--	--	--	**1.46**	--	--	**7.44**	--	--	**6.00**	--	--
YVD-17	YVD-031017-29	3/10/2017	N	K1702448	0.100	U	--	0.500	U	--	--	--	--	**0.038**	--	--	--	--	--	--	--	--	**0.260**	--	--	**5.39**	--	--	**6.26**	--	--
YVD-17	YVD-060617-24	6/6/2017	N	K1705754	0.100	U	--	0.500	U	--	--	--	--	**0.055**	--	--	--	--	--	--	--	--	**1.16**	--	--	**7.81**	--	--	**6.02**	--	--
YVD-17	YVD-092517-08	9/25/2017	N	K1710274	0.100	U	--	0.500	U	--	--	--	--	**0.046**	--	--	--	--	--	--	--	--	**1.73**	--	--	**9.50**	--	--	**7.17**	--	--
YVD-17	YVD-120517-26	12/5/2017	N	K1713091	0.100	U	--	0.500	UJ	MSD	--	--	--	**0.036**	--	--	--	--	--	--	--	--	**1.55**	--	--	**9.87**	--	--	**7.53**	--	--
YVD-17	YVD-060418-20	6/4/2018	N	874662	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**0.780**	--	--	**7.20**	--	--	**6.54**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-17	YVD-060219-12	6/2/2019	N	991939	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	**5.95**	--	--	**3.50**	--	--
YVD-17	YVD-060820-10	6/8/2020	N	009144	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	**6.20**	--	--	**6.06**	--	--
YVD-17	YVD-060621-04	6/6/2021	N	124053	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	**5.75**	--	--	**5.44**	--	--
YVD-17	YVD-060621-05	6/6/2021	FD	124053	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	**5.75**	--	--	**5.31**	--	--
YVD-17	YVD-060622-14	6/6/2022	N	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-17	YVD-062023-15	6/20/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-18	YVD-18-130919	09/19/2013	N	SWI0142	--	--	--	--	R	FBK	--	--	--	--	--	--	0.100	U	--	--	--	--	**3.22**	--	--	**78.3**	--	--	**122**	--	--
YVD-18	YVD-18-130925	09/25/2013	N	SWI0175	2.00	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-18	YVD-18-131211	12/11/2013	N	SWL0073	2.00	U	--	1.50	UJ	MSD	--	--	--	--	--	--	--	--	--	0.060	U	--	**3.02**	--	--	**71.3**	--	--	**116**	--	--
YVD-18	YVD-D2-131211	12/11/2013	FD	SWL0073	2.00	U	--	0.200	UJ	MSD	--	--	--	--	--	--	--	--	--	0.060	U	--	**3.06**	--	--	**70.9**	--	--	**129**	--	--
YVD-18	YVD-18-140318	03/18/2014	N	SXC0095	2.00	U	--	**0.358**	--	--	**0.068**	--	--	--	--	--	--	--	--	--	--	--	**3.30**	--	--	**77.5**	--	--	**147**	J-	MSD
YVD-18	YVD-D2-140318	03/18/2014	FD	SXC0095	2.00	U	--	**0.342**	--	--	**0.082**	--	--	--	--	--	--	--	--	--	--	--	**3.26**	--	--	**78.0**	--	--	**140**	J-	MSD
YVD-18	YVD-18-140603	06/03/2014	N	SXF0017	0.800	U	--	**0.796**	--	--	**0.071**	J+	FBK	--	--	--	--	--	--	--	--	--	**3.24**	--	--	**77.7**	--	--	**135**	J-	MSD
YVD-18	YVD-18-140923	09/23/2014	N	SXI0173	1.00	U	--	**0.335**	J+	MSD	**0.086**	--	--	--	--	--	--	--	--	--	--	--	**3.80**	--	--	**81.6**	--	--	**111**	--	--
YVD-18	YVD-18-141216	12/16/2014	N	SXL0121	1.00	U	--	0.250	UJ	MSD	0.100	U	--	--	--	--	--	--	--	--	--	--	**3.63**	--	--	**81.8**	--	--	**131**	--	--
YVD-18	YVD-18-150317	03/17/2015	N	5904541	1.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.50**	--	--	**87.0**	--	--	**140**	J-	MSD
YVD-18	YVD-18-150617	06/17/2015	N	59010961	1.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**4.10**	J+	MSD	**86.0**	J+	MSD	**120**	--	--
YVD-18	YVD-18-150924	09/24/2015	N	59020391	1.00	U	--	0.250	UJ	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.50**	--	--	**77.0**	--	--	**140**	J-	MSD
YVD-18	YVD-18-151216	12/16/2015	N	59025501	1.00	U	--	--	R	MSD	0.250	UJ	MSD	--	--	--	--	--	--	--	--	--	**4.00**	--	--	**91.0**	--	--	**150**	--	--
YVD-18	YVD-18-160309	03/09/2016	N	59029941	1.00	U	--	0.250	UJ	FDP, MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.80**	--	--	**89.0**	--	--	**150**	J	DUP
YVD-18	YVD-18-160622	6/22/2016	N	59037271	1.00	U	--	--	R	MSD	0.250	U	--	--	--	--	--	--	--	--	--	--	**3.70**	--	--	**86.0**	--	--	**140**	--	--
YVD-18	YVD-18-160928	9/28/2016	N	K1611629	0.100	U	--	0.500	U	--	--	--	--	**0.013**	--	--	--	--	--	--	--	--	**3.75**	--	--	**83.8**	--	--	**135**	--	--
YVD-18	YVD-18-161214	12/14/2016	N	K1615083	0.100	U	--	0.500	U	--	--	--	--	**0.043**	--	--	--	--	--	--	--	--	**3.69**	--	--	**82.5**	--	--	**139**	--	--
YVD-18	YVD-D3-161214	12/14/2016	FD	K1615083	0.100	U	--	0.500	U	--	--	--	--	**0.019**	--	--	--	--	--	--	--	--	**3.82**	--	--	**84.0**	--	--	**142**	--	--
YVD-18	YVD-030617-05	3/6/2017	N	K1702324	**0.040**	J	HTQ	0.500	U	--	--	--	--	**0.024**	--	--	--	--	--	--	--	--	**3.39**	--	--	**78.8**	--	--	**140**	--	--
YVD-18	YVD-060717-31	6/7/2017	N	K1705833	0.100	U	--	0.500	U	--	--	--	--	**0.018**	--	--	--	--	--	--	--	--	**3.82**	--	--	**81.8**	--	--	**135**	--	--
YVD-18	YVD-092617-27	9/26/2017	N	K1710333	0.100	U	--	0.500	U	--	--	--	--	**0.018**	--	--	--	--	--	--	--	--	**3.64**	--	--	**77.0**	--	--	**137**	--	--
YVD-18	YVD-120417-05	12/4/2017	N	K1713026	0.100	U	--	0.500	U	--	--	--	--	0.017	U	MBK	--	--	--	--	--	--	**3.62**	--	--	**81.6**	--	--	**144**	--	--
YVD-18	YVD-031918-17	3/19/2018	N	870634	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.78**	--	--	**83.0**	--	--	**161**	--	--
YVD-18	YVD-060318-07	6/3/2018	N	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.18**	--	--	**88.5**	--	--	**147**	--	--
YVD-18	YVD-090918-12	9/9/2018	N	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.20**	--	--	**78.0**	--	--	**127**	--	--
YVD-18	YVD-121018-09	12/10/2018	N	884857	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.10**	--	--	**87.0**	--	--	**145**	--	--
YVD-18	YVD-031819-13	3/18/2019	N	988273	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.22**	--	--	**88.0**	--	--	**171**	--	--
YVD-18	YVD-060319-23	6/3/2019	N	992053	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.09**	--	--	**86.0**	--	--	**161**	--	--
YVD-18	YVD-090919-06	9/9/2019	N	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.08**	--	--	**76.5**	--	--	**130**	--	--
YVD-18	YVD-090919-08	9/9/2019	FD	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.09**	--	--	**77.0**	--	--	**130**	--	--
YVD-18	YVD-120919-08	12/9/2019	N	902276	0.050	U		0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U		**4.18**			**86.0**	J	MSD	**157**		
YVD-18	YVD-033020-07	3/30/2020	N	006241	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.04**	--	--	**87.5**	--	--	**170**	--	--
YVD-18	YVD-060920-19	6/9/2020	N	009269	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**3.98**	--	--	**89.0**	--	--	**155**	--	--
YVD-18	YVD-092120-15	9/21/2020	N	013896	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.03**	--	--	**83.0**	--	--	**145**	--	--
YVD-18	YVD-092120-17	9/21/2020	FD	013896	0.050	U	--	2.50	UJ	MSD	--	--	--	--	--	--	--	--	--	**0.070**	--	--	**4.00**	--	--	**83.0**	--	--	**144**	--	--
YVD-18	YVD-120820-15	12/8/2020	N	017137	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.11**	--	--	**88.0**	--	--	**164**	--	--
YVD-18	YVD-030221-17	3/2/2021	N	120034	0.050	U	--	5.00	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.02**	--	--	**87.0**	--	--	**169**	--	--
YVD-18	YVD-060821-30	6/8/2021	N	124212	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	**4.02**	--	--	**85.5**	--	--	**161**	--	--
YVD-18	YVD-121521-12	12/15/2021	N	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-18	YVD-121521-14	12/15/2021	FD	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-18	YVD-031522-18	3/15/2022	N	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-18	YVD-060722-25	6/7/2022	N	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 8
Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
YVD-18	YVD-060722-26	6/7/2022	FD	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-18	YVD-091322-13	9/13/2022	N	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-18	YVD-122722-16	12/27/2022	N	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-18	YVD-122722-17	12/27/2022	FD	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-18	YVD-030623-11	3/6/2023	N	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-18	YVD-062023-16	6/20/2023	N	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-18	YVD-091123-23	9/11/2023	N	K2310209	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YVD-18	YVD-120423-11	12/4/2023	N	K2313657	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Equipment Blank	YVD-EB-130918	09/18/2013	EB	SWI0123	0.200	U	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Equipment Blank	YVD-EB-130925	09/25/2013	EB	SWI0175	0.200	U	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Equipment Blank	YVD-EB-131212	12/12/2013	EB	SWL0078	0.200	U	--	0.200	U	--	--	--	--	--	--	--	--	--	--	0.060	U	--	1.00	U	--	0.500	U	--	0.500	U	--
Equipment Blank	YVD-EB-140317	03/17/2014	EB	SXC0081	0.200	U	--	0.250	U	--	--	--	--	0.05	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Equipment Blank	YVD-EB-140318	03/18/2014	EB	SXC0095	0.200	U	--	0.250	U	--	--	--	--	**0.05**	--	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Equipment Blank	YVD-EB-140319	03/19/2014	EB	SXC0107	0.200	U	--	0.250	U	--	--	--	--	0.05	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Equipment Blank	YVD-EB-140604	06/04/2014	EB	SXF0025	0.200	U	--	0.250	U	--	--	--	--	0.05	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	**1.24**	--	--
Equipment Blank	YVD-EB-140924	09/24/2014	EB	SXI0173	0.200	U	--	**1.20**	--	--	--	--	--	**0.062**	--	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Equipment Blank	YVD-EB-141217	12/17/2014	EB	SXL0144	0.200	U	--	0.250	U	--	--	--	--	0.1	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Equipment Blank	YVD-EB-150617	06/17/2015	EB	59011021	0.200	U	--	**0.370**	--	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Equipment Blank	YVD-EB-150925	09/25/2015	EB	59020431	0.200	U	--	**0.380**	--	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Equipment Blank	YVD-EB-151216	12/16/2015	EB	59025501	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Equipment Blank	YVD-EB-160310	03/10/2016	EB	59029941	0.200	U	--	**1.90**	--	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	**1.10**	--	--	0.500	U	--
Equipment Blank	YVD-EB-160623	6/23/2016	EB	59037371	0.200	U	--	**0.430**	--	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Equipment Blank	YVD-EB-160926	9/26/2016	EB	K1611506	0.100	U	--	--	R	MSD	--	--	--	0.01	U	--	--	--	--	--	--	--	**0.100**	J	--	**0.130**	J	--	0.200	U	--
Equipment Blank	YVD-EB-160927	9/27/2016	EB	K1611629	0.050	UJ	HTQ	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.200	U	--	**0.040**	J	--	**0.080**	J	--
Equipment Blank	YVD-EB-160928	9/28/2016	EB	K1611629	0.050	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.200	U	--	**0.040**	J	--	**0.510**	--	--
Equipment Blank	YVD-EB1-161214	12/14/2016	EB	K1615083	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	--	0.200	U	--
Equipment Blank	YVD-EB2-161215	12/15/2016	EB	K1615126	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	MBK	0.200	U	--
Equipment Blank	YVD-EB3-161216	12/16/2016	EB	K1615174	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	MBK	**0.400**	--	--
Field Blank	YVD-F1-130916	09/16/2013	FB	SWI0113	0.200	U	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	1.00	U	--	0.500	U	--	**0.530**	--	--
Field Blank	YVD-F2-130917	09/17/2013	FB	SWI0113	0.200	U	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	1.00	U	--	0.500	U	--	**0.510**	--	--
Field Blank	YVD-F3-130918	09/18/2013	FB	SWI0123	0.200	U	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F4-130918	09/18/2013	FB	SWI0138	0.200	U	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F5-130919	09/19/2013	FB	SWI0142	--	--	--	**0.373**	--	--	--	--	--	--	--	--	**0.243**	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F6-130923	09/23/2013	FB	SWI0178	--	--	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	1.00	U	--	0.500	U	--	--	--	--
Field Blank	YVD-F7-130924	09/24/2013	FB	SWI0175	0.200	U	--	0.250	U	--	--	--	--	--	--	--	0.100	U	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
Field Blank	YVD-F7-130926	09/26/2013	FB	SWI0190	0.200	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.500	U	--
Field Blank	YVD-F1-131209	12/09/2013	FB	SWL0055	0.200	U	--	**0.330**	--	--	--	--	--	--	--	--	--	--	--	0.06	U	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F2-131210	12/10/2013	FB	SWL0063	0.200	U	--	**3.70**	--	--	--	--	--	--	--	--	--	--	--	0.06	U	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F3-131211	12/11/2013	FB	SWL0073	0.200	U	--	**0.430**	--	--	--	--	--	--	--	--	--	--	--	0.06	U	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F4-131212	12/12/2013	FB	SWL0078	0.200	U	--	0.200	U	--	--	--	--	--	--	--	--	--	--	0.06	U	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F1-140316	03/16/2014	FB	SXC0081	0.200	U	--	0.250	U	--	--	--	--	0.05	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F2-140317	03/17/2014	FB	SXC0095	0.200	U	--	0.250	U	--	--	--	--	0.05	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F3-140318	03/18/2014	FB	SXC0107	0.200	U	--	0.250	U	--	--	--	--	0.05	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F4-140319	03/19/2014	FB	SXC0107	0.200	U	--	0.250	U	--	--	--	--	0.05	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F1-140601	06/01/2014	FB	SXF0008	0.200	U	--	0.250	U	--	--	--	--	0.05	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F2-140602	06/02/2014	FB	SXF0017	0.200	U	--	0.250	U	--	--	--	--	**0.061**	--	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F3-140603	06/03/2014	FB	SXF0025	0.200	U	--	0.250	U	--	--	--	--	0.05	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F1-140921	09/21/2014	FB	SXI0148	0.200	U	--	0.250	U	--	--	--	--	0.05	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F2-140922	09/22/2014	FB	SXI0148	0.200	U	--	0.250	U	--	--	--	--	0.05	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F3-140923	09/23/2014	FB	SXI0158	0.200	U	--	0.250	U	--	--	--	--	0.05	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F4-140924	09/24/2014	FB	SXI0173	0.200	U	--	0.250	U	--	--	--	--	**0.054**	--	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F1-141215	12/15/2014	FB	SXL0103	0.200	U	--	0.250	U	--	--	--	--	0.1	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	UJ	DUP
Field Blank	YVD-F2-141215	12/15/2014	FB	SXL0108	0.200	U	--	0.250	U	--	--	--	--	0.1	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F3-141216	12/16/2014	FB	SXL0121	0.200	U	--	0.250	U	--	--	--	--	0.1	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F4-141217	12/17/2014	FB	SXL0144	--	R	HTQ	0.250	U	--	--	--	--	0.1	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F1-150315	03/15/2015	FB	5904471	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F2-150316	03/16/2015	FB	5904541	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F3-150317	03/17/2015	FB	5904651	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F1-150615	06/15/2015	FB	59010751	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F2-150616	06/16/2015	FB	59010961	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F3-150617	06/17/2015	FB	59011021	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F1-150922	09/22/2015	FB	59020141	0.200	U	--	**0.260**	--	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F2-150923	09/23/2015	FB	59020281	0.200	U	--	0.250	U	--	--	--	--	**0.26**	--	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F3-150923	09/23/2015	FB	59020391	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F4-150924	09/24/2015	FB	59020391	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F5-150925	09/25/2015	FB	59020431	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F1-151213	12/13/2015	FB	59025351	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F2-151214	12/14/2015	FB	59025431	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F3-151215	12/15/2015	FB	59025501	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F4-151216	12/16/2015	FB	59025501	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F1-160307	03/07/2016	FB	59029521	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F2-160308	03/08/2016	FB	59029711	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F3-160309	03/09/2016	FB	59029941	0.200	U	--	**0.300**	--	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F4-160310	03/10/2016	FB	59029941	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F1-160620	6/20/2016	FB	59037101	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F2-160621	6/21/2016	FB	59037151	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F3-160622	6/22/2016	FB	59037271	0.200	U	--	**0.360**	--	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-F4-160623	6/23/2016	FB	59037371	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Field Blank	YVD-FB-160926	9/26/2016	FB	K1611506	0.100	U	--	--	R	MSD	--	--	--	0.01	U	--	--	--	--	--	--	--	**0.080**	J	--	**0.030**	J	--	0.200	U	--
Field Blank	YVD-FB-160927	9/27/2016	FB	K1611565	0.100	U	--	--	R	MSD	--	--	--	0.01	U	--	--	--	--	--	--	--	0.200	U	--	0.200	U	--	0.200	U	--
Field Blank	YVD-FB-160928	9/28/2016	FB	K1611629	0.050	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.200	U	--	**0.050**	J	--	**3.61**	--	--
Field Blank	YVD-FB-160929	9/29/2016	FB	K1611698	0.100	U	--	--	R	MSD	--	--	--	0.01	U	--	--	--	--	--	--	--	0.200	U	--	**0.050**	J	--	0.200	U	--
Field Blank	YVD-FB1-161212	12/12/2016	FB	K1615029	0.100	UJ	HTQ	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	MBK	0.200	U	MBK
Field Blank	YVD-FB2-161213	12/13/2016	FB	K1615045	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	MBK	0.200	U	--
Field Blank	YVD-FB3-161214	12/14/2016	FB	K1615083	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	MBK	**0.350**	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
Field Blank	YVD-FB4-161215	12/15/2016	FB	K1615126	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	MBK	0.200	U	--
Field Blank	YVD-FB5-161216	12/16/2016	FB	K1615174	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	MBK	0.200	U	--
Field Blank	YVD-030617-01	3/6/2017	FB	K1702228	0.100	U	--	**0.200**	J	--	--	--	--	0.01	U	--	--	--	--	--	--	--	**0.080**	J	--	**0.040**	J	--	0.200	U	--
Field Blank	YVD-030717-06	3/7/2017	FB	K1702324	0.100	UJ	HTQ	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	--	0.200	U	--
Field Blank	YVD-030817-11	3/8/2017	FB	K1702324	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	--	0.030	J	--
Field Blank	YVD-030917-17	3/9/2017	FB	K1702404	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	--	0.200	U	--
Field Blank	YVD-031017-26	3/10/2017	FB	K1702448	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	--	0.260	--	--
Field Blank	YVD-031317-30	3/13/2017	FB	K1702489	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	--	0.200	U	--
Field Blank	YVD-060417-01	6/4/2017	FB	K1705702	21.0	U	--	**0.700**	--	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.021	U	--	**0.110**	J	--	5.30	U	--
Field Blank	YVD-060517-07	6/5/2017	FB	K1705702	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	**0.060**	J	--	**0.110**	J	--	**0.250**	--	--
Field Blank	YVD-060617-17	6/6/2017	FB	K1705754	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	--	0.200	U	--
Field Blank	YVD-060717-28	6/7/2017	FB	K1705833	0.100	U	--	0.500	U	--	--	--	--	0.01	U	--	--	--	--	--	--	--	0.210	U	--	**0.020**	J	--	0.200	U	--
Field Blank	YVD-092517-01	9/25/2017	FB	K1710274	0.100	U	--	0.500	U	--	--	--	--	0.010	U	--	--	--	--	--	--	--	0.210	U	MBK	0.210	U	MBK	0.200	U	--
Field Blank	YVD-092617-16	9/26/2017	FB	K1710333	0.100	U	--	0.500	U	--	--	--	--	0.010	U	--	--	--	--	--	--	--	**0.090**	J	--	0.210	U	MBK	**0.860**	--	--
Field Blank	YVD-120417-01	12/4/2017	FB	K1713026	0.100	U	--	0.500	U	--	--	--	--	0.010	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	--	0.200	U	--
Field Blank	YVD-120517-32	12/5/2017	FB	K1713091	0.100	UJ	HTQ	0.500	UJ	MSD	--	--	--	0.010	U	--	--	--	--	--	--	--	0.210	U	--	**0.070**	J	--	**0.710**	--	--
Field Blank	YVD-120617-25	12/6/2017	FB	K1713157	0.100	U	--	0.500	U	--	--	--	--	0.010	U	--	--	--	--	--	--	--	0.210	U	--	0.210	U	MBK	0.200	U	--
Field Blank	YVD-031818-01	3/18/2018	FB	870610	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-031918-10	3/19/2018	FB	870634	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-060318-01	6/3/2018	FB	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-060418-12	6/4/2018	FB	874568	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-060518-26	6/5/2018	FB	874860	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-061218-33	6/12/2018	FB	875438	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-090918-01	9/9/2018	FB	880601	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-121018-01	12/10/2018	FB	884857	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-121118-12	12/11/2018	FB	884939	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-031719-01	3/17/2019	FB	988239	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-031819-11	3/18/2019	FB	988273	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-032019-20	3/20/2019	FB	988477	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-060219-01	6/2/2019	FB	991939	0.050	U	--	--	R	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	**0.460**	--	--
Field Blank	YVD-060319-13	6/3/2019	FB	992053	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	**0.340**	--	--
Field Blank	YVD-060419-26	6/4/2019	FB	992242	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	**0.130**	--	--
Field Blank	YVD-090919-01	9/9/2019	FB	998357	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-090919-03	9/9/2019	FB	998357	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-091019-15	9/10/2019	FB	998438	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-091019-17	9/10/2019	FB	998438	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-120919-01	12/9/2019	FB	902276	0.050	U	--	0.500	UJ	MSD	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-120919-09	12/9/2019	FB	902276	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-121019-16	12/10/2019	FB	902321	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-121019-18	12/10/2019	FB	902321	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-033020-01	3/30/2020	FB	006241	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-033020-03	3/30/2020	FB	006241	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-033120-13	3/31/2020	FB	006260	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-033120-15	3/31/2020	FB	006260	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-060820-01	6/8/2020	FB	009144	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-060820-02	6/8/2020	FB	009144	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-060920-11	6/9/2020	FB	009269	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-060920-13	6/9/2020	FB	009269	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-061020-29	6/10/2020	FB	009361	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-061020-28	6/10/2020	FB	009361	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--

Table 8

Historical Groundwater Analytical Results

Analyte					Nitrite (as N)			Total Kjeldahl Nitrogen			Phosphorus			Phosphorus			Phosphorus			Phosphorus			Potassium			Sodium			Sulfate		
Analytical Method					EPA 300.0			EPA 351.2			EPA 365.1			EPA 365.3			EPA 365.4			SM 4500 P--E			EPA 200.7			EPA 200.7			EPA 300.0		
Well ID	Sample Name	Sample Date	Sample Type	Sample Group	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code	Result (mg/L)	Qualifier	Validation Code
Field Blank	YVD-092020-01	9/20/2020	FB	013864	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-092020-02	9/20/2020	FB	013864	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-092120-10	9/21/2020	FB	013896	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-092120-12	9/21/2020	FB	013896	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-120720-01	12/7/2020	FB	017035	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-120720-03	12/7/2020	FB	017035	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-120820-16	12/8/2020	FB	017137	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-120820-18	12/8/2020	FB	017137	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-030121-01	3/1/2021	FB	119931	0.050	U	--	1.10	J	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-030121-03	3/1/2021	FB	119931	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-030221-11	3/2/2021	FB	120034	0.050	U	--	0.800	J	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-030221-13	3/2/2021	FB	120034	NS	--	--	NS	--	--	--	--	--	--	--	--	--	--	--	NS	--	--	NS	--	--	NS	--	--	NS	--	--
Field Blank	YVD-060621-01	6/6/2021	FB	124053	0.050	U	--	0.500	U	--	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-060621-02	6/6/2021	FB	124053	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-060721-11	6/7/2021	FB	124105	0.050	U	--	0.800	J	MS, RPD	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-060721-12	6/7/2021	FB	124105	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-060821-20	6/8/2021	FB	124212	0.050	U	--	0.500	UJ	MS	--	--	--	--	--	--	--	--	--	0.070	U	--	0.620	U	--	0.700	U	--	0.100	U	--
Field Blank	YVD-060821-21	6/8/2021	FB	124212	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-121421-01	12/14/2021	FB	K2114499	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-121521-13	12/15/2021	FB	K2114550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-031422-01	3/14/2022	FB	K2202633	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-031522-09	3/15/2022	FB	K2202727	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-060522-01	6/5/2022	FB	K2206116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-060622-13	6/6/2022	FB	K2206160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-060722-23	6/7/2022	FB	K2206237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-060822-33	6/8/2022	FB	K2206299	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-091322-01	9/13/2022	FB	K2210558	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-091422-14	9/14/2022	FB	K2210629	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-120622-01	12/6/2022	FB	K2214386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-120722-08	12/7/2022	FB	K2214479	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-120822-12	12/8/2022	FB	K2214578	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-122722-22	12/27/2022	FB	K2215230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-030523-01	3/5/2023	FB	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-030623-07	3/6/2023	FB	K2302738	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-061923-01	6/19/2023	FB	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-062023-05	6/20/2023	FB	K2307010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-062123-21	6/21/2023	FB	K2307093	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-091023-02	9/10/2023	FB	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-091123-08	9/11/2023	FB	K2310138	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-120423-05	12/4/2023	FB	K2313548	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Blank	YVD-120623-03	12/6/2023	FB	K2313796	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Blank Check	WW-1	4/25/2016	BC	59032861	40.0	U	--	**1.40**	--	--	--	--	--	0.25	U	--	--	--	--	--	--	--	**190**	--	--	**400**	--	--	100	U	--
Blank Check	DW-1	4/25/2016	BC	59032861	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--
Blank Check	DI-1	4/25/2016	BC	59032861	0.200	U	--	0.250	U	--	--	--	--	0.25	U	--	--	--	--	--	--	--	1.00	U	--	0.500	U	--	0.500	U	--

Table 8
Historical Groundwater Analytical Results

Notes:
1. Well dry; no sample could be collected.
Bold: detected result
--: not applicable
(as N): reported as nitrogen
(as CaCO3): reported as calcium carbonate
BC: blank check
DUP: Laboratory duplicate relative percent difference was outside acceptance limits.
EB: equipment blank
EPA: U.S. Environmental Protection Agency
ERL: elevated reporting limit
FB: field blank
FBK: field blank contamination
FD: field duplicate
FDP: Field duplicate relative percent difference exceeded acceptance limits.
HTQ: Analysis completed outside of the designated holding time.
J: The compound was positively identified; however, the associated numerical value is an estimated concentration.
J-: The result is an estimated quantity, but the result may be biased low.
J+: The result is an estimated quantity, but the result may be biased high.
MBK: method blank contamination
mg/L: milligrams per liter
MSD: The matrix spike/matrix spike duplicate percent recoveries were outside target limits.
N: normal sample
NR: Sample did not meet collection criteria; not a representative sample.
NS: Not sampled
PRS: Incorrect sample preservation.
R: The sample results are rejected as unusable. The compound may or may not be present in the sample.
RPD: Relative percent difference was outside acceptance limits.
SM: Standard Method
U: The compound was analyzed for but not detected. The associated value is the compound reporting limit, or the compound is considered non-detect at the listed value due to associated blank contamination.
UJ: The compound was not detected above the reported sample reporting limit; however, the reporting limit is approximate and may or may not represent the actual limit of quantitation.

Appendix D
Data Validation Report

1201 3rd Avenue, Suite 2600
Seattle, Washington 98101
206.287.9130

ANCHOR QEA

Data Validation Report – EPA Stage 2A

January 8, 2024

Project: Yakima Valley Dairies

Project Number: 220996-01.01

Validation Number: AQ-2024-0009

This report summarizes the review of analytical results for 17 water samples, two field duplicate samples, and two field blank samples collected between December 3 and 7, 2023. The samples were collected by Anchor QEA and submitted to ALS Environmental (ALS), in Kelso, Washington. The samples were analyzed for the following:

- Nitrate by U.S. Environmental Protection Agency (EPA) Method 300.0
- Nitrate + nitrite by EPA Method 353.2

ALS sample data groups (SDGs) K2313548, K2313657, and K2313796 were reviewed in this report. Sample IDs, matrices, and analyses are presented in Table 1.

Table 1
Sample IDs, Matrices, and Analyses

Location ID	Sample ID	Lab Sample ID	Matrix	Analyses
YVD-12	YVD-120323-01	K2313548-001	Water	Nitrate
DC-05D	YVD-120423-02	K2313548-002	Water	Nitrate
YVD-08	YVD-120423-03	K2313548-003	Water	Nitrate
DC-05	YVD-120423-04	K2313548-004	Water	Nitrate
FB	YVD-120423-05	K2313548-005	Water	Nitrate
DC-05 (FD)	YVD-120423-06	K2313548-006	Water	Nitrate
YVD-16	YVD-120423-07	K2313548-007	Water	Nitrate
DC-04	YVD-120423-08	K2313548-008	Water	Nitrate
YVD-13	YVD-120423-09	K2313657-001	Water	Nitrate
DC-07	YVD-120423-10	K2313548-009	Water	Nitrate
YVD-18	YVD-120423-11	K2313657-002	Water	Nitrate
DC-03D	YVD-120423-12	K2313657-003	Water	Nitrate
YVD-09	YVD-120423-13	K2313657-004	Water	Nitrate
DC-03	YVD-120423-14	K2313657-005	Water	Nitrate
YVD-14R	YVD-120423-15	K2313657-006	Water	Nitrate
YVD-15	YVD-120623-01	K2313796-001	Water	Nitrate
YVD-15 (FD)	YVD-120623-02	K2313796-002	Water	Nitrate
FB	YVD-120623-03	K2313796-003	Water	Nitrate
DC-14	YVD-120623-04	K2313796-004	Water	Nitrate

Location ID	Sample ID	Lab Sample ID	Matrix	Analyses
YVD-10	YVD-120623-05	K2313796-005	Water	Nitrate
YVD-11	YVD-120723-01	K2313796-006	Water	Nitrate

Notes:
FB: field blank
FD: field duplicate

Data Validation and Qualifications

The following comments refer to the laboratory's performance in meeting the quality assurance/quality control guidelines outlined in the analytical procedures. Laboratory results were reviewed using the laboratory control limits and the following guidelines:

- *Groundwater Monitoring Quality Assurance Project Plan, Addendum No. 1* (Anchor QEA 2016)
- *Groundwater Monitoring Quality Assurance Project Plan, Update No. 2* (Anchor QEA 2018)
- *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods* (EPA 1986)
- *National Functional Guidelines for Inorganic Superfund Methods Data Review* (EPA 2020)

Unless noted in this report, laboratory results for the samples listed in Table 1 were within quality control criteria.

Field Documentation

Field documentation was checked for completeness and accuracy. The chain-of-custody forms were signed by ALS at the time of sample receipt. Samples were received in good condition and within the recommended temperature range.

Holding Times and Sample Preservation

Samples were appropriately preserved and analyzed within holding times with the exception of 14 samples which were received outside the analytical hold time. Results were confirmed within hold time by EPA Method 353.2, and results for EPA Method 300.0 were reported with "UJ" or "J" qualifiers.

Laboratory Method Blanks

Laboratory method blanks were analyzed at the required frequencies. All method blanks were free of target analytes.

Quality Control

Field Blanks

Two field blanks were collected in association with these sample sets. No target analytes were detected in the blanks.

Field Duplicates

Two field duplicates were collected in association with these sample sets. All relative percent difference (RPD) values were within control limits. Detected results are summarized in Table 2.

Table 2
Field Duplicate Summary

Analyte	YVD-120423-04	YVD-120423-06	RPD
Nitrate	50.9 mg/L	50.9 mg/L	0%

Analyte	YVD-120623-01	YVD-120623-02	RPD
Nitrate	14.0 mg/L	14.0 mg/L	0%
Nitrate + Nitrite	13.9 mg/L	14.1 mg/L	1%

Note:
mg/L: milligram per liter

Laboratory Control Samples

Laboratory control samples were analyzed at the required frequency, and all analyses resulted in recovery values within project-required control limits.

Matrix Spike and Matrix Spike Duplicate Samples

Matrix spike (MS) samples and matrix spike duplicate (MSD) samples were analyzed on two project samples. All MS/MSD recoveries and/or RPD values were within project-required control limits.

Laboratory Duplicates

A laboratory duplicate was analyzed on sample YVD-120323-01. The RPD value was within project-required control limits.

Sample Analyses

An additional container was submitted for preservation and archive for each sample for use as nitrate concentration verification. If the laboratory was unable to analyze a sample for nitrate by EPA Method 300.0 within the 48-hour hold time, the archived sample was analyzed by EPA Method 353.3, which is a measurement of both nitrate and nitrite. These samples had nitrate concentration verified by EPA Method 353.2 analysis. Results are presented in Table 3.

Table 3
Comparison of Results for Nitrate and Nitrate + Nitrite

Sample ID	Nitrate	Nitrate + Nitrite	RPD
YVD-120323-01	16 mg/L	16 mg/L	0.0%
YVD-120423-07	25.5 mg/L	25.7 mg/L	0.8%
YVD-120423-09	38 mg/L	36.5 mg/L	4.0%
YVD-120423-11	30.2 mg/L	29.3 mg/L	3.0%
YVD-120423-12	36.9 mg/L	35.7 mg/L	3.3%
YVD-120423-13	66.9 mg/L	65.5 mg/L	2.1%
YVD-120423-14	137 mg/L	137 mg/L	0.0%
YVD-120423-15	111 mg/L	111 mg/L	0.0%
YVD-120623-01	14 mg/L	13.9 mg/L	0.7%
YVD-120623-02	14 mg/L	14.1 mg/L	0.7%
YVD-120623-04	43 mg/L	42.5 mg/L	1.2%
YVD-120623-05	64.3 mg/L	64.1 mg/L	0.3%

Note:
mg/L: milligram per liter

Method Reporting Limits

Method reporting limits (MRLs) were acceptable as reported. All values below detection were reported using the laboratory MRLs. Values were reported as undiluted or diluted, in which case the MRL accurately reflects the dilution factor.

Overall Assessment

As was determined by this evaluation, the laboratory followed the specified analytical methods, and all requested sample analyses were completed. Accuracy was acceptable, as demonstrated by the laboratory control and MS/MSD samples. Precision was acceptable, as demonstrated by the laboratory and field duplicates. All data are acceptable as reported or as qualified. Project completeness was 100%. One sample was not collected at well YVD-02 because the well was dry.

Data Qualifier Definitions

J Indicates an estimated value

U Indicates the compound or analyte was analyzed for but not detected at or above the specified limit

UJ Indicates the compound or analyte was analyzed for but not detected and that the specified limit reported is estimated

Table 4
Data Qualification Summary

SDG	Sample ID	Parameter	Analyte	Reported Result	Qualified Result	Reason
K2313548	YVD-120323-01	Water	Nitrate	16 mg/L	16J mg/L	Hold time exceedance
K2313548	YVD-120423-05	Water	Nitrate	0.1U mg/L	0.1UJ mg/L	Hold time exceedance
K2313548	YVD-120423-07	Water	Nitrate	25.5 mg/L	25.5J mg/L	Hold time exceedance
K2313657	YVD-120423-09	Water	Nitrate	38 mg/L	38J mg/L	Hold time exceedance
K2313657	YVD-120423-11	Water	Nitrate	30.2 mg/L	30.2J mg/L	Hold time exceedance
K2313657	YVD-120423-12	Water	Nitrate	36.9 mg/L	36.9J mg/L	Hold time exceedance
K2313657	YVD-120423-13	Water	Nitrate	66.9 mg/L	66.9J mg/L	Hold time exceedance
K2313657	YVD-120423-14	Water	Nitrate	137 mg/L	137J mg/L	Hold time exceedance
K2313657	YVD-120423-15	Water	Nitrate	111 mg/L	111J mg/L	Hold time exceedance
K2313796	YVD-120623-01	Water	Nitrate	14 mg/L	14J mg/L	Hold time exceedance
K2313796	YVD-120623-02	Water	Nitrate	14 mg/L	14J mg/L	Hold time exceedance
K2313796	YVD-120623-03	Water	Nitrate	0.1U mg/L	0.1UJ mg/L	Hold time exceedance
K2313796	YVD-120623-04	Water	Nitrate	43 mg/L	43J mg/L	Hold time exceedance
K2313796	YVD-120623-05	Water	Nitrate	64.3 mg/L	64.3J mg/L	Hold time exceedance

Note:
mg/L: milligram per liter

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Eric Winiecki Declaration
Exhibit N

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101-3140

ENFORCEMENT &
COMPLIANCE ASSURANCE
DIVISION

MEMORANDUM

SUBJECT: Clean Drinking Water Project

FROM: ERIC WINIECKI Digitally signed by ERIC WINIECKI Date: 2022.11.03 10:04:57 -07'00'

TO: The File

On October 14, 2022, several EPA staff participated in a meeting with attorneys who have represented Community Association of Restoration of the Environment (CARE) to learn more about efforts by a project in the Lower Yakima Valley called the Clean Drinking Water Project (CDWP). The CDWP was established in accordance with and funded by Consent Decrees that CARE and other citizens groups signed with the Cow Palace Dairy, DeRuyter Dairy and Bosma Dairy in 2015. Meeting participants included Charles Tebbutt and Parker Jones of Tebbutt Law, and Matt Moore, Jennifer MacDonald, and Eric Winiecki of EPA.

CARE informed EPA that when the CDWP project began in 2015, Nuestra Casa in Sunnyside ran the Clean Drinking Water Project using funds provided by the settlements. Nuestra Casa was a good fit for the outreach work because a significant number of residents speak only Spanish.

Focus was initially on the area within the Dairies' footprint and within a 3-mile downgradient boundary from these facilities.

The CDWP would contact residents, test their water with permission, and install reverse osmosis (RO) drinking water treatment units or provide bottled drinking water if the drinking water at a residence exceeded 9 mg/L (the federal standard maximum contaminant limit (MCL) for nitrate is 10 mg/L), and if the residence agreed to participate in the program. Efforts to reach potentially affected residents included sending letters to residences on Yakima County's tax parcel map, and door-to-door canvassing with bilingual representatives.

CDWP prepared an annual report on their activities.

On or about 2018, Nuestra Casa ended their involvement with the DCWP program when the program began to sample outside the 3-mile boundary. CDWP transitioned from oversight by Charlie Tebbutt Law Office and operation by Nuestra Casa to oversight by a non-profit board that would sample beyond the 3-mile boundary, in part because data showed that the nitrate problem in the Lower Yakima Valley (LYV) was more widespread than the 3-mile boundary area. Also a settlement involving Snipes Mountain/ John Bosma dairy also known as Spring Canyon Ranch brought in more money for sampling outside of the 3 mile boundary. In March 202 with the pandemic, everything shut down. In 2020, there was a transition of the oversight board again, and it's been slow getting the program restarted.

The CDWP conducted annual outreach, however no new outreach to residences with potentially contaminated wells has been completed since COVID began. As CARE attorneys understand it, the CDWP continues to maintain RO units and provide bottled water to residences that were receiving services before COVID. During the

winter during the pandemic, though maintenance was ongoing, COVID protocols slowed down the work. CARE's attorneys stated that they expect that more outreach will occur; that there is some restaffing happening.

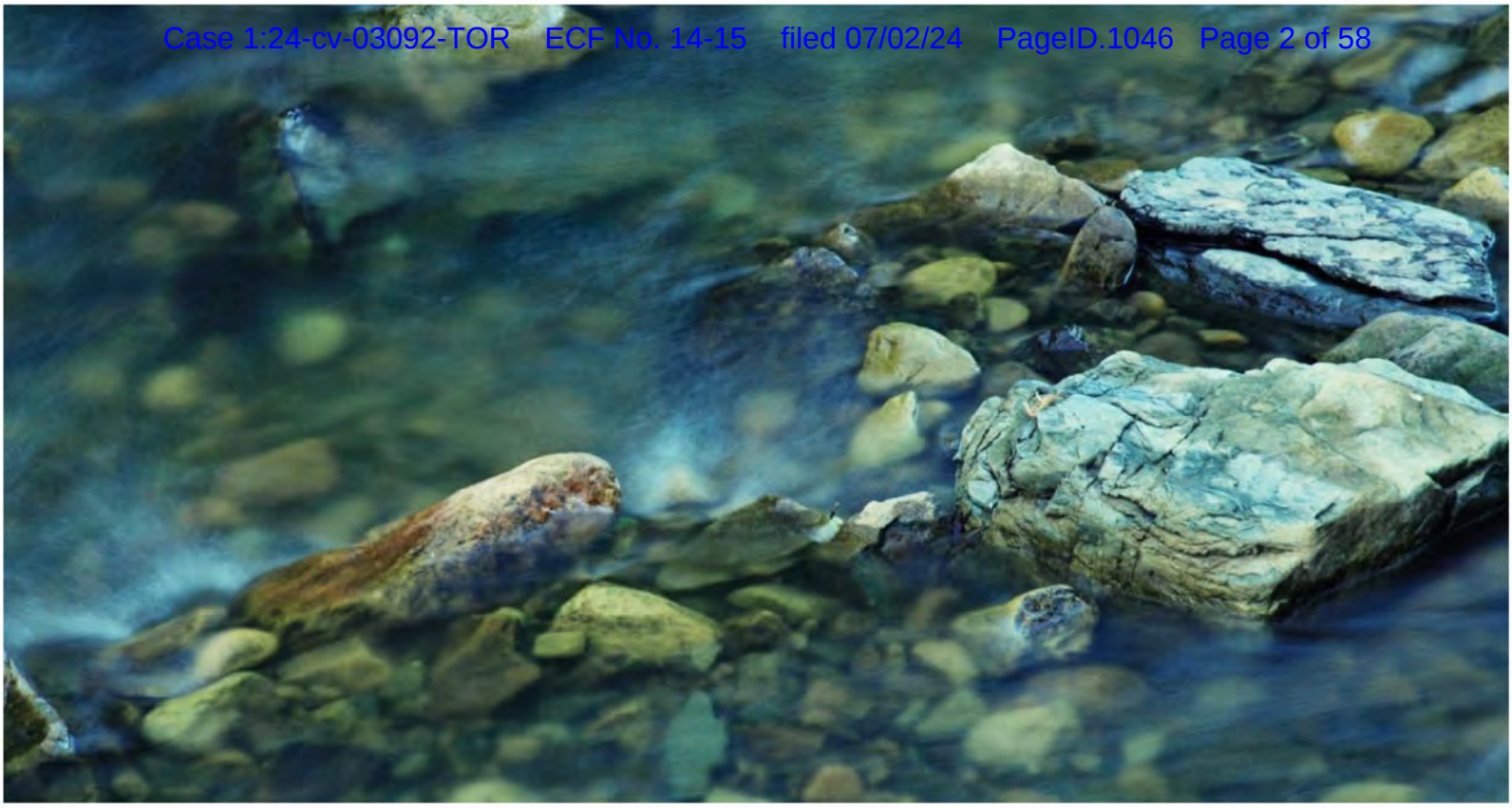
CARE's attorneys stated that some homes have been sampled multiple times by CDWP. At some homes that have been tested multiple times, CDWP has observed increases in nitrate concentration in subsequent tests.

CARE's attorneys stated that some homes have been "missed" by the CDWP and are not protected. Some homes have never responded to CDWP about water testing. Some residents have declined to talk with CDWP. Some have exceeded the nitrate MCL but not opted for an RO unit or bottled water.

On or about 2019, CDWP stopped providing RO units or bottled water to residences within the 3-mile boundary that were owned by Dairy entities so that Dairies could provide treatment services to their own properties where they were serving as landlord. CARE did not know the current status of properties owned by the Dairies --- whether, at the time of the conference call, the Dairies were currently providing RO units or bottled water to their residences that exceeded the MCL.

CARE's attorneys indicated that the CDWP may currently be maintaining RO units or providing bottled water within the 1-mile boundary that the Consent Order Dairies don't report to EPA under the Consent Order. CARE's attorneys said that it may be challenging for them to separate out information about residences within the one-mile boundary from others if EPA were to request this information.

Eric Winiecki Declaration
Exhibit O



March 1, 2023
Yakima Valley Dairies | SDWA-10-2013-0080

ANCHOR QEA

Yakima Valley Dairies 2022 Annual Report

Prepared for Cow Palace, LLC
George DeRuyter & Son Dairy, LLC; D&A Dairy, LLC; George & Margaret, LLC
Liberty Dairy, LLC; H&S Bosma Dairy

March 1, 2023
Yakima Valley Dairies | SDWA-10-2013-0080

Yakima Valley Dairies 2022 Annual Report

Prepared for
Cow Palace, LLC
George DeRuyter & Son Dairy, LLC; D&A Dairy, LLC;
George & Margaret, LLC
Liberty Dairy, LLC; H&S Bosma Dairy

Prepared by
Anchor QEA, LLC
1119 Pacific Avenue, Suite 1600
Tacoma, Washington 98042
In association with Agrimanagement, Inc.,
and Landau Associates, Inc.

Project Number: 232996-01.01
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TABLE OF CONTENTS

Executive Summary ES-1

1 Introduction 1

2 Alternative Drinking Water Supply 3

2.1 Evaluation and Treatment System Installations 3

2.2 2022 Maintenance of Water Systems 3

3 Actions to Further Control Potential Sources of Nitrogen 6

3.1 Solid Separators 6

3.2 Backflow Prevention 6

3.3 Cow Pens 6

3.4 Roof Runoff 7

3.5 Elimination of Furrow Irrigation 7

3.6 Lagoons 7

3.6.1 Cow Palace Dairy 8

3.6.2 Liberty/H&S Bosma Dairies 10

3.6.3 George DeRuyter & Son/D&A Dairies 14

4 Groundwater Monitoring Program 18

4.1 Groundwater Monitoring Quality Assurance Project Plan 19

4.2 Well Installation and Maintenance 19

4.2.1 Dedicated Bladder Pumps 19

4.2.2 Monitoring Well Pressure Transducers 19

4.3 Quarterly Groundwater Monitoring Data Reports 20

4.4 Summary of Findings 21

4.4.1 Groundwater Nitrate Monitoring 21

4.4.2 Groundwater Nitrate Concentration Trend Analysis 22

4.4.3 Site Hydrogeology 23

5 Actions to Ensure Effective Nutrient Management 26

5.1 Application Fields 26

5.2 Irrigation Water Management 27

5.2.1 Sensor Installation and Maintenance 28

5.2.2 Irrigation Monitoring Results 28

5.3 Cow Palace Dairy Application Fields 29

5.3.1 Soil Nitrate Level Summary 29
5.3.2 Application Field Management 30
5.3.3 Field Moisture Management 30
5.4 Liberty/H&S Bosma Dairies Application Fields 30
5.4.1 Soil Nitrate Level Summary 31
5.4.2 Application Field Management 31
5.4.3 Field Moisture Management 32
5.5 George DeRuyter & Son/D&A Dairies Application Fields 32
5.5.1 Soil Nitrate Level Summary 32
5.5.2 Application Field Management 33
5.5.3 Field Moisture Management 33
5.6 Off-Site Transfers 34

6 Other Reports, Plans, and Actions 35
6.1 Annual Reports 35
6.2 Quality Assurance Project Plans 35
6.3 Health and Safety Plan 35
6.4 Public Involvement 35

7 References 36

8 Certifications 41
Cow Palace Dairy Certification 41
George DeRuyter & Son Dairy, D&A Dairy, and George & Margaret Certification 42
Liberty Dairy Certification 43

TABLES

Table 1 Reverse Osmosis System Maintenance Summary, 2013 to 2022
Table 2 Cow Palace Lagoons – Summary of Pumped Leachate per Year
Table 3 Groundwater Monitoring Well Construction Data
Table 4 Historical Groundwater Chemistry Data, 2013 to 2022
Table 5 Historical Groundwater Elevations, 2013 to 2022
Table 6 Summary of Compiled Nitrate Monitoring Data – Yakima Valley Dairies (AOC Wells)
Table 7a Cow Palace Dairy Manure Nutrient Concentrations – Total N, 2013 to 2022
Table 7b Cow Palace Dairy Manure Nutrient Concentrations – Total NH4, 2013 to 2022

Table 7c	Cow Palace Dairy Manure Nutrient Concentrations – Total P, 2013 to 2022
Table 7d	Cow Palace Dairy Manure Nutrient Concentrations – Total K, 2013 to 2022
Table 8a	Liberty Dairy Manure Nutrient Concentrations – Total N, 2013 to 2022
Table 8b	Liberty Dairy Manure Nutrient Concentrations – Total NH4, 2013 to 2022
Table 8c	Liberty Dairy Manure Nutrient Concentrations – Total P, 2013 to 2022
Table 8d	Liberty Dairy Manure Nutrient Concentrations – Total K, 2013 to 2022
Table 9a	George DeRuyter & Son Dairy Manure Nutrient Concentrations – Total N, 2013 to 2022
Table 9b	George DeRuyter & Son Dairy Manure Nutrient Concentrations – Total NH4, 2013 to 2022
Table 9c	George DeRuyter & Son Dairy Manure Nutrient Concentrations – Total P, 2013 to 2022
Table 9d	George DeRuyter & Son Dairy Manure Nutrient Concentrations – Total K, 2013 to 2022
Table 10	Irrigation Sensor Review – 2022 Field Capacity Exceedance List
Table 11	2022 Cow Palace Dairy Application Field Soil Sample Results
Table 12	2022 Liberty/H&S Bosma Dairies Application Field Soil Sample Results
Table 13	2022 George DeRuyter & Son/D&A Dairies Application Field Soil Sample Results

FIGURES

Figure 1	Dairy Locations and Monitoring Well Network
Figure 2	Residential Well Sampling Locations
Figure 3	Progress of Lagoon Lining and Abandonments
Figure 4	Conceptual Site Model
Figure 5	Conceptual Site Model Flow Chart
Figure 6	2022 Groundwater Nitrate Concentrations
Figure 7a	Surficial Aquifer Groundwater Elevation Contour Map First Quarter 2022
Figure 7b	Surficial Aquifer Groundwater Elevation Contour Map Second Quarter 2022
Figure 7c	Surficial Aquifer Groundwater Elevation Contour Map Third Quarter 2022
Figure 7d	Surficial Aquifer Groundwater Elevation Contour Map Fourth Quarter 2022
Figure 8	Groundwater Nitrate Concentrations – Upgradient Monitoring Wells, 2013 to 2022
Figure 9	Groundwater Nitrate Concentrations – Northern Downgradient Monitoring Wells, 2013 to 2022
Figure 10	Groundwater Nitrate Concentrations – Central Downgradient Monitoring Wells, 2013 to 2022

Figure 11	Groundwater Nitrate Concentrations – West Downgradient Monitoring Wells, 2013 to 2022
Figure 12	Groundwater Nitrate Concentrations – East Downgradient Monitoring Wells, 2013 to 2022
Figure 13a	Nitrate Isoconcentration Contour Map – Historical Maximum Running Average
Figure 13b	Nitrate Isoconcentration Contour Map – Most Recent Running Average
Figure 14	Nitrate Concentration Trend Summary
Figure 15a	Nitrate Trend Plots – Central Area Wells
Figure 15b	Nitrate Trend Plots – Eastern Area Wells
Figure 15c	Nitrate Trend Plots – Western Area Wells
Figure 16	Fall 2022 Compliance with Target Nitrogen Levels
Figure 17	Irrigation Water Management Plan Conceptual Site Model
Figure 18	Moisture Sensor Data – Example
Figure 19	Number of Fields with Soil NO3 over 45 ppm in the Second Foot, 2013 to 2022
Figure 20	Trends in Post-Harvest Nitrate Concentrations in Cow Palace Dairy Application Fields Expressed as Area-Weighted Concentrations
Figure 21	Trends in Post-Harvest Nitrate Concentrations in Liberty/H&S Bosma Dairies Application Fields Expressed as Area-Weighted Concentrations
Figure 22	Trends in Post-Harvest Nitrate Concentrations in George DeRuyter & Son/D&A Dairies Application Fields Expressed as Area-Weighted Concentrations

APPENDICES

Appendix A	Reverse Osmosis System Outreach Documents
Appendix B	Lagoon Maintenance Information
Appendix C	2022 Quarterly Groundwater Monitoring Data Reports
Appendix D	Seasonal Groundwater Elevation Patterns
Appendix E	2022 Application Field Season Reports
Appendix F	2022 Cow Palace Dairy CAFO Annual Report
Appendix G	2022 Liberty/H&S Bosma Dairies CAFO Reporting Data
Appendix H	2022 George DeRuyter & Son/D&A Dairies CAFO Annual Report

ABBREVIATIONS

AFMP	application field management plan
bgs	below ground surface
CAFO	Concentrated Animal Feeding Operation
CDMA	code division multiple access
Consent Order	Administrative Order on Consent
DAF	dissolved-air flotation
Dairies	Yakima Valley Dairies
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
GCL	geosynthetic clay liner
HASP	health and safety plan
HDPE	high-density polyethylene
IWMP	irrigation water management plan
K	potassium
MCL	maximum contaminant level
MDL	method detection level
MG	millions of gallons
mg/L	milligrams per liter
N	nitrogen
NH4	ammonium
NDN	nitrification/denitrification
NE Catch Basin	Cow Palace Dairy Northeast Catch Basin
NRCS	Washington Natural Resources Conservation Service
NW Catch Basin	Cow Palace Dairy Northwest Catch Basin
O&M	operations and maintenance
P	phosphorus
ppm	parts per million
QAPP	quality assurance project plan
RO	reverse osmosis
SOW	Statement of Work
TKN	total Kjeldahl nitrogen
VWC	volumetric water content
Yakima Valley Dairies	1) Cow Palace, LLC; 2) D&A Dairy, LLC (also known as D and A Dairy, L.L.C.), George DeRuyter & Son Dairy, LLC, and George & Margaret, LLC; and 3) Liberty Dairy, LLC, and its associated dairy facility H&S Bosma Dairy

Executive Summary

This 2022 Annual Report summarizes work done and data collected by 1) Cow Palace, LLC; 2) George DeRuyter & Son Dairy, LLC, D&A Dairy, LLC (also known as D and A Dairy, L.L.C.), and George & Margaret, LLC; and 3) Liberty Dairy, LLC, and its associated dairy facility H&S Bosma Dairy (collectively referred to as the Yakima Valley Dairies or Dairies).

The Dairies and the U.S. Environmental Protection Agency (EPA) have exchanged correspondence regarding next steps under Administrative Order on Consent (Consent Order) Docket No. SDWA-10-2013-0080 following completion of the first 8 years of required work. Consistent with the dispute resolution provisions of the Consent Order, counsel for the Dairies requested in a letter to John Matthew Moore (EPA Counsel) dated June 3, 2022; a joint technical and legal meeting with EPA to discuss future groundwater monitoring; other testing and reporting requirements; and next steps under the Consent Order. The Dairies submitted a follow-up request on June 29, 2022. The Dairies are awaiting a response to this request. In the interim, the Dairies have conducted voluntary groundwater monitoring and reporting, continued monitoring their application fields consistent with Concentrated Animal Feeding Operation (CAFO) permit requirements (using the same soil testing procedures as previously performed under the Consent Order), and voluntarily provided this annual report.

The Dairies and EPA signed the Consent Order in March 2013 to address nitrate contamination of the drinking water aquifer beneath and downgradient of the Dairy facilities.

The goal of the Consent Order is to achieve drinking water quality that meets the EPA maximum contaminant level (MCL) for nitrate of 10 milligrams per liter (mg/L) in the drinking water aquifer beneath and downgradient of the Dairies. Exposure to nitrate at concentrations that exceed the MCL is linked to methemoglobinemia, or "blue baby syndrome," in infants, a potentially fatal condition in which the blood system cannot carry enough oxygen around the body. Four Consent Order objectives support this goal, including providing safe drinking water to residents whose well water exceeds the nitrate federal drinking water standard, taking actions to control potential sources of nitrogen at the Dairies, monitoring groundwater to ensure the effectiveness of source control actions, and ensuring effective nutrient management at the Dairies to reduce the introduction of nitrate to the drinking water aquifer.

In 2013, the Dairies collectively kept approximately 25,000 animals on their facilities. Each Dairy was and is a large Concentrated Animal Feeding Operation. The relationship of the Dairy facilities with nitrate migration and groundwater contamination is depicted in the conceptual site model contained in this Annual Report (Figures 4 and 5). Data summarized in this Annual Report were collected and analyzed by the Dairies in accordance with EPA-approved quality assurance project plans (QAPPs).

QAPPs are designed to ensure that all data are of known and documented quality, of sufficient quantity, legally defensible, and suitable for their intended use.

In 2013, in accordance with the Consent Order, the Dairies identified 223 private residences within the boundary of, or within 1 mile downgradient of their facilities. Forty-five residences already had reverse osmosis (RO) treatment units in place, and 67 additional residences exceeded the nitrate MCL of 10 mg/L as determined by laboratory analysis conducted by the Dairies. Some residences were vacant, could not be reached after multiple attempts, or refused to participate in the sampling. In 2013, residential drinking water samples that were sent by the Dairies to a laboratory for analysis indicated that nitrate concentrations in the samples ranged from 3.06 mg/L to 51.6 mg/L.

In accordance with the Consent Order, in 2013 the Dairies offered to install and maintain RO systems at residences that exceeded the MCL and offered to maintain RO systems at residences that already had one. An additional 17 units have been installed since that time; this includes 16 residences whose wells were tested during the 2013 outreach effort but who did not respond to an offer for RO system installation at that time. The 17th residence has been built since the 2013 outreach effort and shares a well on the same parcel with a residence that tested above the MCL in 2013. One well serves two separate residences with the same address. Installation dates are as follows: nine RO systems were installed in 2016, one was installed in 2017, one was installed in 2018 (but uninstalled due to a leaking component prior to 2020 and reinstalled in 2021), one was installed in 2020, one was installed in 2021, one was installed in 2022, and installation dates for three RO systems are unknown. All residences are located within the 1-mile downgradient area and are included in Table 1. The RO systems were installed or maintained based on the 2013 test results.

In 2022, the Dairies provided maintenance of RO drinking water treatment units to 66 downgradient residences and provided bottled water to three downgradient residences. One of these three residence continues to receive bottled water service and RO system maintenance. In 2021, four residences that previously received bottled water, in addition to maintenance of installed RO systems, were transitioned to RO system maintenance only and no longer receive bottled water service because an RO system has been installed at the residence. One residence that previously only received bottled water service in 2021 requested installation of an RO system in 2022; the RO system was installed, and the residence no longer receives bottled water service. Annual RO system maintenance will continue to be offered to these six residences.

The Consent Order provides that the Dairies may discontinue the provision of an alternative water supply to a residence if they demonstrate to EPA that the nitrate level in a drinking water well is consistently below the MCL over a 2-year period, as measured on a quarterly basis (eight quarters). Since the Consent Order was signed in 2013, the Dairies have not proposed to discontinue the provision of alternative water to any residence on this basis.

In 2022, the average concentrations of total nitrogen in liquid manure samples was 1,737 parts per million (ppm) in Cow Palace lagoons, 2,463 ppm in H&S Bosma lagoons, and 1,703 ppm in the George DeRuyter & Son lagoons (see Tables 7a, 8a, and 9a).

Under the Consent Order, the Dairies are nearing completion of lining or abandonment of 41 earthen animal waste storage lagoons to reduce or eliminate nitrogen leakage from the lagoons to subsurface soils and groundwater. The Dairies have completed the lining or abandonment of an additional three lagoons not regulated under the Consent Order.

Lining and abandonment activities at Cow Palace Dairy were completed in 2020.

At the beginning of 2022, the lining of one remaining lagoon at George DeRuyter & Son/D&A Dairies was in progress. Lining of this final lagoon was completed in 2022.

At the beginning of 2022, there were three remaining lagoons (Bosma Lagoon Nos. 1, 2, and 3) at Liberty/H&S Bosma Dairies requiring abandonment. Lagoon No. 3 was emptied and cleaned in late 2021, and Lagoon Nos. 1 and 2 were emptied and cleaned in 2022. Following subsurface soil testing, EPA required implementation of interim containment actions at these three lagoons. These actions were initiated in late 2022 and completed early in February 2023.

On a volume basis using the initial capacities of the original lagoons, at the end of scheduled 2022 construction, the three Dairies will have lined or abandoned 83% of their 126.1-million-gallon lagoon storage capacity. Cow Palace Dairy has lined or abandoned 100% of its 31.7-million-gallon lagoon storage capacity. George DeRuyter & Son/D&A Dairies have completed the lining or abandonment of 100% of their 38.9-million-gallon lagoon storage capacity. Liberty/H&S Bosma Dairies have completed the lining or abandonment of 62% of their 55.5-million-gallon lagoon storage capacity. The remaining lagoons remain empty pending final abandonment activities.

In 2022, George DeRuyter & Son Dairy continued to operate its manure digester, producing low-carbon biogas for alternative fuels production. The digester was operational 365 days and produced 96,723,095 cubic feet of methane. The Dairy also continued to operate its nitrogen treatment system, called a nitrification/denitrification (NDN) system, in one of its lagoons to reduce the amount of nitrogen in its liquid manure. The NDN system was taken offline in December 2021 to facilitate the lining of the lagoon that contains the NDN system (Lagoon No. 1). The NDN system is scheduled to be reinstalled and brought back online in spring 2022. While the NDN system is fully operational, it is used to treat approximately 90% of the Dairy's manure.

The original 8 years of quarterly groundwater monitoring required by the Consent Order were completed during Second Quarter 2021. After consultation with EPA, the Dairies voluntarily implemented additional monitoring events between Fourth Quarter 2021 and Fourth Quarter 2022.

Results for all four 2022 groundwater monitoring events are summarized in this report along with past data collected under the Consent Order.

During 2022, groundwater nitrate concentrations exceeded the MCL in at least one quarter in 17 of 22 downgradient wells. Nitrate concentrations in downgradient wells ranged from 0.61 mg/L in monitoring well YVD-17 to 182 mg/L in monitoring well DC-03. Groundwater nitrate concentrations in all four upgradient wells were either below the MCL or dry. Historical groundwater concentration plots for nitrate are provided in Figures 8 through 12.

Groundwater data collected from 2013 through December 2022 have been analyzed for trends in nitrate concentrations as summarized in this report. Observed trends in the 26 Consent Order wells include the following:

- Upgradient wells (4): Three upgradient wells exhibited nitrate concentrations consistently below the MCL during the most recent four sampling events. The fourth upgradient well (YVD-02) has been dry for the past nine sampling events.
- Downgradient water table wells (19):
  - Five downgradient wells have been consistently below the MCL.
  - Seven downgradient wells exhibit decreasing trends. All of these wells had previously exhibited increasing trends.
  - Four downgradient wells exhibit stable trends that are neither increasing nor decreasing. One of these wells had previously exhibited an increasing trend that has now stabilized.
  - Three downgradient wells exhibit increasing trends.
- Deeper wells (3): All three deeper wells exhibit stable trends.

In support of the objective of effective nutrient management, the Dairies continued pre-plant and post-harvest soil and manure sampling to help ensure that the application of nitrogen to their crop fields does not exceed agronomic rates. This sampling is required under the CAFO permit requirements for each Dairy. Overall, nitrogen levels in fields to which manure is applied have declined significantly at all three monitored depth intervals from excessive levels that were measured by the Dairies in 2013 (Figures 20, 21, and 22).

Fall post-harvest nitrate concentrations in the application fields at all three Dairies remained below the 45-ppm target at the 2-foot depth interval (12 to 24 inches), except for one George DeRuyter & Son Dairy application field (GDS-SU04 at 47 ppm).

The Dairies collected "post-harvest" representative soil samples from the 1-foot, 2-foot, and 3-foot depth intervals below ground surface from each application crop field. As of fall 2022, the nitrate-N levels at the 2-foot and 3-foot depth intervals average less than 15 ppm, well below the 45-ppm target

value established in the Consent Order for the 2-foot depth interval. These values have decreased an average of approximately 78% since the execution of the Consent Order in 2013.

Based on fall 2022 post-harvest soil data, collectively in all the Dairies' crop fields there were about 104 tons of nitrate-N at the 1-foot soil depth (a decrease of 69% since 2013), about 70 tons at the 2-foot depth (a decrease of 80% since 2013), and about 106 tons at the 3-foot depth (a decrease of 70% since 2013). At EPA's direction, these estimates were developed by multiplying the area-weighted nitrate-N estimates developed by the Dairies for each crop field at each soil depth, multiplying by the number of acres of crop fields for each Dairy to estimate the pounds of nitrate in the fields for each Dairy at each depth, adding the pounds at each soil depth at each Dairy to estimate the total pounds of nitrate at all the Dairies at each soil depth, and dividing by 2,000 to convert to tons. These estimates do not include additional nitrogen in the form of ammonium, mineralization from past manure, or mineralization from organic matter, which are likely to break down and form additional nitrate.

Nitrate is highly mobile in water, and the nitrate in the soil column is vulnerable to leaching and migration into the groundwater. The Dairies have converted many of their fields to alfalfa production or grow alfalfa as part of crop rotation. Established multiyear stands of alfalfa can pull nitrate out of the soil deeper than 2 feet if the roots are allowed sufficient time to grow deeper into the soil profile. The strong decreases in average nitrate-N levels at the 3-foot level suggests that such deep nitrogen utilization is occurring.

To minimize the discharge of nitrate-laden irrigation water out of the root zone, the Dairies continued to monitor soil moisture levels in their application fields (see the charts in Appendix E). The Consent Order requires at least two soil moisture monitoring locations in each of the Dairies' 34 application fields. Each monitoring location, or "station," includes three sensors at different soil depths. Most fields have two sensor stations, and some have three. The number of stations identified for placement in each field was based on consideration of the location and type of susceptible areas (those areas within each field that may be the most susceptible to the migration of irrigation water below the crop root zone, such as low-lying areas within soils with the greatest permeability) as well as the irrigation method being used in that field. The Dairies installed 82 moisture sensor stations in 2,303 acres of application fields, which on average is one station for every 28 acres. Table 10 summarizes the network of irrigation sensor stations.

Movement of nitrate-laden water out of the root zone can also mobilize nitrate deeper in the soil column from past over-applications of nitrogen and transport it to the drinking water aquifer. During 2022, upgrades and repairs were completed to return the set of 82 irrigation sensors to full operation. This was necessary to correct equipment failures from harvest damage and equipment malfunction.

Based on data from operating sensor stations, total field capacity exceedances observed at the 3-foot depth per sensor for Cow Palace Dairy, Liberty/H&S Bosma Dairies, and George DeRuyter & Son/D&A Dairies occurred over only 1.6%, 1.1%, and 1.3% of the entire 2022 irrigation season, respectively. Some of these exceedances appear to be due to spring wet-weather conditions unrelated to field irrigation. It is impossible to eliminate the discharge of water from all fields all the time, but the duration of discharges due to irrigation can be managed if enough data is properly collected and utilized.

The Dairies continued to implement controls and monitoring for their off-site shipments of manure consistent with CAFO permit requirements for each of the Dairies.

1 Introduction

This Annual Report was prepared by Anchor QEA, LLC, in association with Agrimanagement, Inc., and Landau Associates, Inc., on behalf of: 1) Cow Palace, LLC; 2) George DeRuyter & Son Dairy, LLC, D&A Dairy, LLC (also known as D and A Dairy, L.L.C.), and George & Margaret, LLC; and 3) Liberty Dairy, LLC, and its associated dairy facility H&S Bosma Dairy (collectively referred to as the Yakima Valley Dairies [Dairies]). Dairy locations are shown in Figure 1.

The Dairies and the U.S. Environmental Protection Agency (EPA) have exchanged correspondence regarding next steps under Administrative Order on Consent (Consent Order) Docket No. SDWA-10-2013-0080 following completion of the first 8 years of required work. Consistent with the dispute resolution provisions of the Consent Order, counsel for the Dairies requested in a letter to John Matthew Moore (EPA Counsel) dated June 3, 2022; a joint technical and legal meeting with EPA to discuss future groundwater monitoring; other testing and reporting requirements; and next steps under the Consent Order. The Dairies submitted a follow-up request on June 29, 2022. The Dairies are awaiting a response to this request. In the interim, the Dairies have conducted voluntary groundwater monitoring, continued monitoring of application fields consistent with Concentrated Animal Feeding Operation (CAFO) permit requirements for each Dairy (using the same soil testing procedures as previously performed under the Consent Order), and voluntarily prepared this annual report.

This report outlines activities undertaken by the Dairies pursuant to the Consent Order (EPA 2013) and Statement of Work (SOW) during the calendar year 2022, which covers the period from January 1 to December 31, 2022. This report includes the information required by Section III.K.2 of the SOW.

The goal of the work conducted in accordance with the Consent Order is to achieve drinking water quality that meets EPA maximum contaminant level (MCL) for nitrate of 10 milligrams per liter (mg/L) in the drinking water aquifer beneath and downgradient of the Dairies. The objectives of the work conducted in accordance with the SOW are as follows:

1. Expeditiously provide a permanent, safe alternative drinking water supply to residents using private drinking water wells that exceed the MCL for nitrate (nitrate as nitrogen, or N03-N) and are on or within 1 mile downgradient of the Dairies.
2. Take specific actions to further control potential sources of nitrogen at the Dairies.
3. Establish a network of monitoring wells to measure the effectiveness of the nitrogen source reduction actions on water quality in the shallow alluvial aquifer that serves as an underground source of drinking water.
4. Ensure effective nutrient management at the Dairies to reduce the introduction of nitrate to an underground source of drinking water.

In 2022, EPA and the Dairies corresponded via teleconference meetings, document submittals, and EPA comment letters regarding a number of actions pursuant to the Consent Order. EPA comment letters are noted (as applicable) throughout this report.

2 Alternative Drinking Water Supply

2.1 Evaluation and Treatment System Installations

In accordance with the Consent Order, in 2013 the Dairies identified 223 private residences within the boundary of or within 1 mile downgradient of their facilities. Thirty-three residences were vacant, could not be reached after multiple attempts, or refused to participate in the sampling. Out of 142 residences that were sampled for nitrate in drinking water (either by Hach test strip or laboratory analysis), 68 residences exceeded the MCL for nitrate in drinking water of 10 mg/L. Laboratory analyses conducted by the Dairies showed that nitrate concentrations in the residential samples ranged from 3.06 mg/L to 51.6 mg/L. A comprehensive dataset of the residential well sampling locations is provided in Figure 2.

Forty-five additional residences were documented to have a reverse osmosis (RO) treatment system already installed at the time of sampling. Pre-treatment nitrate concentrations at several Cow Palace employee residences with already installed RO systems ranged from 9.18 mg/L to 72.8 mg/L.

In accordance with the Consent Order, in 2013 the Dairies offered to install and maintain RO systems at residences that exceeded the MCL and offered to maintain RO systems at residences that already had one. Additional RO systems have been installed since that time.

At the remaining locations, the Dairies offered in 2013 to fund the installation and maintenance of RO treatment systems or to provide bottled water. A total of 36 residences accepted the offer for a new RO system, and 8 residences were supplied with bottled water. In addition, the Dairies also committed to maintain RO systems at an additional 15 residences where RO systems had been previously installed by the residences.

2.2 2022 Maintenance of Water Systems

As of 2022, there were a total of 66 residences within the 1-mile downgradient boundary of the Dairies that have accepted water system installation or maintenance. A summary of 2022 outreach and maintenance activities for these 66 residences is summarized in Table 1. A typical annual RO system maintenance appointment includes replacement of the 10-inch 1-micron sediment filter, replacement of the nitrate-removal cartridge, and replacement of the pre- and post-RO filters. The RO system is checked for wear and tear and leaks, and components are replaced as needed. Water from the tap is tested for nitrates to confirm the system has been installed or serviced properly.

Outreach activities were conducted by Anchor QEA to coordinate the RO system maintenance in 2022. Outreach activities included mailing bilingual RO system maintenance notification postcards written in English and Spanish (Appendix A), phone calls conducted in English and Spanish, and door-to-door outreach with a Spanish-language interpreter available on call.

RO system maintenance notification postcards written in English and Spanish were mailed in June and October 2022. Contact information to schedule an appointment for both English and Spanish speakers was included on either side of the postcard. One week after each round of RO maintenance notification postcards was mailed to residences, phone call outreach was conducted.

Phone call outreach was conducted in English and Spanish. Residences who provided contact information from previous year's outreach efforts were contacted first to schedule annual RO system maintenance appointments. Depending on when a residence responded to the offer of maintenance, multiple calls were made in an attempt to schedule an appointment.

Door-to-door visits were conducted at residences if the phone number was unknown, if the phone number was no longer in service, or if the previous occupant stated they no longer lived at the address. Door-to-door outreach was conducted in June 2022 after the first round of postcards and phone calls, then in October 2022 after the second round of phone calls and postcards. Both door-to-door outreach efforts included 2 days of in-person visits, with 1 day of door-to-door visits in the morning and the other day in the evening. If a residence chose to provide their contact information during these visits, the residence was contacted by phone and an appointment for the next available appointment date was scheduled the same day or the following day. Otherwise, appointments were scheduled as soon as the residence called to schedule an appointment. A maintenance notification postcard was provided to each residence, if access to the front door was inaccessible due to "No Trespassing" signs, closed gates, or aggressive dogs; the postcard was left in a visible location on the gate or other obvious point of entry from the main road.

Thirteen residences with laboratory results above 27 mg/L nitrate and who accepted an offer of RO system installation or RO system maintenance in 2013, or who have had an RO system installed since then, were offered the option of an additional RO maintenance appointment in November 2022, if the residence had received RO maintenance at least 4 months prior. All 13 residences received annual RO system maintenance in 2022.

Of these 13 residences:

- Four accepted the offer of additional RO system maintenance.
- Five received RO system maintenance less than 4 months prior.
- Two made appointments for additional RO system maintenance in November 2022, but at the time and date of their appointments, one residence was drilling a new well and had disconnected the RO system, and the other was not home for the appointment.
- Two residences did not respond to an offer of additional maintenance in November 2022.

Four residences were not responsive to any outreach efforts, and four residences declined RO system maintenance. One residence scheduled an appointment but was not home at the scheduled time and date, and the resident did not respond to subsequent calls to reschedule maintenance.

Prior to 2021, eight residences received bottled water delivery service. Of these residences, seven did not respond to an offer of RO system installation in 2013, and one residence refused installation. Since then, five residences have had an RO system installed while still receiving bottled water service. Notifications were sent to these five residences in May 2021 notifying them that they would be transitioned from bottled water service and RO system maintenance to RO system maintenance only.

Two of these residences accepted an offer of annual RO system maintenance in 2021 and were transitioned to RO system maintenance only. Two residences did not respond to outreach efforts; of these two, one had not accepted any bottled water deliveries for the entire year of 2021, and the other residence accepted bottled water deliveries for only 3 months out of the year. The fifth residence requested to maintain both bottled water delivery service and RO system maintenance.

In 2022, an RO system was installed at one residence that previously received bottled water service only. In total, four residences have transitioned to RO maintenance only and received annual RO system maintenance in 2022, one residence declined RO maintenance, one residence receives bottled water service and RO system maintenance, and two residences receive bottled water service only.

3 Actions to Further Control Potential Sources of Nitrogen

This section describes the status of actions taken to control potential sources of nitrogen from the Dairies, apart from the management of application fields. Application field management is discussed in Section 5.

3.1 Solid Separators

Section III.F.4 of the SOW requires the Dairies to take action within 60 days of the Effective Date of the Consent Order to reduce nitrate contributions from solid separators at each Dairy. Actions must include the following: 1) relocating solid separators onto an impervious surface; 2) installing a berm and containing areas receiving solids; and 3) directing leachate to storage ponds or lagoons.

In 2013, a review was conducted of the solid separator areas at each Dairy. Results indicated solid separator areas at each Dairy were found to be in compliance with the requirements of the SOW, as described in the *2013 Annual Report* (IES 2016).

In 2022, the solids separation systems at each Dairy included the following:

- Slope screen separator and polymer system at Cow Palace Dairy (this system replaced the centrifuge previously operated by the Dairy as described subsequently)
- Centrifuge system at Liberty/H&S Bosma Dairies
- Dissolved-air flotation (DAF) system at George DeRuyter & Son/D&A Dairies

3.2 Backflow Prevention

Section III.F.5 of the SOW requires the Dairies to install and maintain backflow prevention devices within 30 days of the Effective Date of the Consent Order to protect wells at each Dairy.

In 2013, the presence of backflow prevention devices at each Dairy was confirmed, as described in the *2013 Annual Report* (IES 2016). The Dairies' backflow prevention devices are detailed as follows:

- Liberty Dairy and H&S Bosma Dairy had pre-existing backflow preventers on its three production wells.
- Cow Palace Dairy also had existing backflow preventers on its four production wells.
- George DeRuyter & Son Dairy and D&A Dairy had a total of three production wells. Two of the three wells had previously installed backflow preventers. The third was installed in 2014.

In 2022, the backflow prevention devices remained operational.

3.3 Cow Pens

Section III.F.10 of the SOW requires the Dairies to minimize the ponding of liquid in the cow pen areas to reduce infiltration of nitrogen-rich water.

In 2022, the Dairies continued implementing cow pen management actions at each Dairy to prevent liquid ponding and infiltration. Pens were graded to ensure liquid generated in the pens was conveyed to each Dairy's lagoon system. Low spots occurring over time as a result of cow traffic were regraded and filled to prevent ponding. Cow pens were scraped on a weekly basis to remove accumulated manure and bedding material from the areas. Additionally, feed-mixing areas are located on asphalt or concrete surfaces, and Dairies with free stalls (Liberty/H&S Bosma Dairies and George DeRuyter & Son/D&A Dairies) are equipped with concrete flush lanes.

3.4 Roof Runoff

Section III.F.11 of the SOW requires the Dairies to confirm that roof runoff is not allowed to pond on the ground and infiltrate; roof runoff must either be kept separated from contaminated areas or directed to lagoons.

In 2022, roof runoff continued to be conveyed to the Dairies' lagoon systems. Roof runoff in animal operation areas is conveyed to the cow pens and feed lanes either by gutter or direct runoff from the roof surface. From the cow pens and feed lanes, the roof runoff is directed to the lagoon system. Roof runoff in feed-mixing areas is conveyed to the drains associated with the silage piles. Roof runoff controls are described in the *2013 Annual Report* (IES 2016).

3.5 Elimination of Furrow Irrigation

Section III.F.8 of the SOW requires the Dairies to eliminate furrow irrigation at each Dairy within 2 years of the Effective Date of the Consent Order. Furrow irrigation, also known as flood irrigation, is an age-old irrigation technique that irrigates fields by running water in furrows between the crop rows. Furrow irrigation results in over-saturation of parts of the field and has been shown to result in a higher incidence of water and nutrient transport below the root zone in comparison to sprinkler irrigation.

In 2013, the Dairies had several crop fields that still employed furrow irrigation. Furrow irrigation was eliminated at each Dairy by converting these remaining fields to sprinkler systems, as described in the *2013 Annual Report* (IES 2016).

From 2014 to 2022, no furrow irrigation has been used by the Dairies.

3.6 Lagoons

Section III.F.6 of the SOW requires the Dairies to submit to EPA a Lagoon Review Report within 60 days of the Effective Date of the Consent Order demonstrating the existing lagoons were constructed to the current Washington Natural Resources Conservation Service (NRCS) 313 standard. The Dairies submitted Lagoon Review Reports (ARCADIS 2013a, 2013b, 2013c) that were approved by EPA on July 11, 2013. Save for one lagoon, Cow Palace Lagoon No. 4, the Dairies did not provide

documentation that showed that their other 40 lagoons were designed and built to meet current NRCS standards.

For the 40 lagoons that did not meet the current NRCS 313 standard, the Dairies were required to submit a Lagoon Evaluation Plan to assess whether the lagoons met the standard. In 2014, the Dairies submitted a Lagoon Evaluation Method Determination QAPP (ARCADIS 2014) and Lagoon Evaluation QAPPs (IES 2014a, 2014b, 2014c). However, on February 6, 2015, the Dairies notified EPA of their election to forgo testing of the lagoons and instead begin lining them in accordance with the requirements in the Consent Order.

In 2022, the Dairies lined or abandoned several lagoons in accordance with Section III.F.6 of the SOW.

3.6.1 Cow Palace Dairy

Cow Palace Dairy elected to line its manure storage lagoons with a double-membrane liner system. This system includes two high-density polyethylene (HDPE) liners separated by a drainage layer. The drainage layer can consist of a layer of geocomposite material (as used for the Northwest Catch Basin [NW Catch Basin] lined in 2016) or a lower membrane liner with a dimpled surface that allows drainage between the liners without the need for a geocomposite (as used on Consolidated Lagoon No. 2). A leak detection system is installed between the liners to detect and collect accumulations of leachate associated with leaks in the upper liner should they occur. Monitoring of leachate production from this system is used to determine when repairs of the upper liner are required.

Cow Palace Dairy also upgraded its lagoon network to expand storage capacity in some lagoons (e.g., the consolidation and expansion of Lagoon Nos. 2 and 3 in 2017 and the consolidation and expansion of Settling Basins A and B in 2020) and eliminate other unneeded lagoons. This included the abandonment of one of the Cow Palace Dairy lagoons (the Northeast Catch Basin [NE Catch Basin]).

Cow Palace Dairy completed lining of their lagoons in 2020. With abandonments and consolidations, the total number of lagoons at Cow Palace Dairy has been reduced from nine to six.

No lagoon design or construction activities remained to be completed in 2022. Lagoon operations and maintenance (O&M) activities were performed for all the lined lagoons. These activities are described in more detail in Section 3.6.1.1. The status of the Cow Palace Dairy lagoon program is summarized in Figure 3.

3.6.1.1 Operations and Maintenance of Existing Lined Lagoons

In 2022, Cow Palace Dairy staff continued with the O&M of its lagoon system per the *Cow Palace Dairy Facility Operations, Maintenance, and Monitoring Plan* (WET 2018). O&M activities for existing lined lagoons included the following:

- **NW Catch Basin:** The NW Catch Basin was lined in 2016. Lagoon inspections and maintenance activities were completed in accordance with the O&M plan for this lagoon during 2022. A total of 230 gallons of leachate were generated in 2022 (Table 2). No significant maintenance or repair activities were required.
- **Consolidated Lagoon No. 2:** This lagoon was expanded (including consolidation with former Lagoon No. 3) and lined in 2017. Lagoon inspections were completed for this lagoon during 2022. No leachate generation was noted during 2022 (Table 2). No significant maintenance or repair activities were required.
- **Lagoon No. 4:** This lagoon was previously shown to comply with applicable Natural Resource Conservation Service design requirements for waste storage lagoons. It has a clay-amended soil liner. Lagoon inspections were completed during 2022. No significant maintenance or repair activities were required.
- **Lagoon No. 1:** This lagoon was lined in 2019. The Lagoon No. 1 work was reviewed and approved by the Washington State Department of Ecology (Ecology) Dam Safety Office in early February 2020, after which the lagoon was returned to service. A leak in the upper liner was detected upon startup and repaired by Northwest Linings in May 2020. The lagoon was returned to service and no additional leachate production has been observed since that time. Lagoon inspections were completed in accordance with the O&M plan for this lagoon during 2022. No leachate production was noted during 2022 (Table 2). No significant maintenance or repair activities were required in 2022.
- **Settling Basin AB:** Settling Basins A and B were consolidated and lined in 2020. Measurable liquid was observed in the Settling Basin AB sump after it was put into service in April 2021. A plugged manure line adjacent to the lagoon resulted in wastewater leaking into the soil around the liner. This spilled wastewater flowed downgradient and seeped between the primary and secondary liners, making its way to the leak detection sump. Lagoon wastewater did not leak through the upper primary liner, and there are no integrity issues with the liner. Lagoon inspections were completed for this lagoon during 2022. No leachate production was noted during 2022 (Table 2). No significant maintenance or repair activities were required.
- **Safety Debris Catch Basin:** The safety debris catch basin was lined in 2019. Lagoon inspections were completed for this lagoon during 2022. No leachate production was noted during 2022 (Table 2). No significant maintenance or repair activities were required.

Records of the weekly inspections conducted in 2022 are included in Appendix B.

3.6.1.2 Submittals and Approvals

In 2022, Cow Palace Dairy submitted the following documents related to lagoon construction:

- *Response to EPA Comment Letter 277 Regarding Cow Palace Dairy Lagoon No. 1* (Anchor QEA 2022a) – Submitted by Anchor QEA on February 24, 2022
- *Cow Palace Dairy Lagoon No. 1 and Safety Debris Catch Basin Completion Report* (LAI 2022) – Resubmitted by Landau Associates on February 25, 2022

3.6.2 Liberty/H&S Bosma Dairies

Liberty/H&S Bosma Dairies elected to line their manure storage lagoons with a hybrid double-liner system. This system includes an HDPE liner placed over the top of a geosynthetic clay liner (GCL). In this system, each liner protects and reinforces the other. The upper HDPE liner protects the lower GCL from drying out or being eroded by lagoon maintenance activities. The GCL helps add durability to the lining system in that the GCL can self-seal from small punctures. In this application, the GCL also has a long operational life. Leak detection surveys for the upper liner are performed using a combination of visual and electronic leak detection surveys in alternating years.

In 2022, Liberty/H&S Bosma Dairies continued activities toward upgrading their lagoon network to consolidate smaller lagoons and eliminate other unneeded lagoons. To date, this has triggered the consolidation of three Liberty Dairy lagoons in 2017 (now called Consolidated Lagoon No. 15); the abandonment of four H&S Bosma Dairy lagoons, which began in 2018; the consolidation of three H&S Bosma Dairy lagoons in 2019 (now called Consolidated Lagoon No. 10); the consolidation of two H&S Bosma Dairy lagoons (now called Consolidated Lagoon No. 7) in 2020; the abandonment of Lagoon No. 18, which was completed in 2022; and the consolidation of three H&S Bosma Dairy lagoons (now called Consolidated Lagoon No. 4) in 2021. The abandonment of Lagoon No. 3 and Lagoon Nos. 1 and 2 was initiated in 2021 and 2022, respectively, but is not yet complete. Abandonment of these final three remaining lagoons is ongoing and will be completed early 2023. Once the remaining abandonments have been completed, lining, consolidation, and abandonment activities at Liberty/H&S Bosma Dairies will have reduced the total number of active lagoons from 22 to 7.

These activities are described in more detail in Section 3.6.2.1. The status of the Liberty/H&S Bosma Dairies lagoon program is summarized in Figure 3.

3.6.2.1 Abandonment of Lagoon Nos. 1, 2, and 3

Lagoon Nos. 1, 2, and 3 were historically used to manage liquid and solid manure and stormwater generated from normal dairy operations. These lagoons are no longer needed for manure storage because of increased storage generated from lagoon consolidations and expansions and operational changes. Following abandonment, the area will be used for crop production.

Lagoon Nos. 1, 2, and 3 are proposed for abandonment to eliminate them as potential sources of nitrogen pollution to groundwater. Abandonment activities completed to date include the following:

- The Dairy notified EPA of its proposal to abandon the lagoons in December 2020 and submitted its first abandonment plan for all three lagoons in May 2021.
- In response to a request from EPA, the Dairy submitted a lagoon capacity review to EPA in April 2022 verifying that it had sufficient storage capacity to proceed with lagoon abandonment.
- All three lagoons have been removed from service and have been emptied of liquid and solid manures (cleanouts were completed at Lagoon No. 3 in November 2021, Lagoon No. 2 in May 2022, and Lagoon No. 1 in July 2022).
- Abandonment plans were previously submitted to EPA on May 27, 2021 (all three lagoons); January 18, 2022 (Lagoon No. 3); and April 25, 2022 (all three lagoons).
- EPA modified the April 2022 plan to focus on soil sampling requirements and conditionally approved that plan on May 12, 2022.
- Anchor QEA conducted soil sampling pursuant to the EPA-approved plan between May and September 2022, in addition to data collected previously in October and November 2021. Anchor QEA submitted an addendum to the Sampling and Quality Assurance Project Plan in November 2022 to resolve quality assurance issues associated with the original testing laboratory. Final soil testing data are included with this plan.
- Anchor QEA submitted a draft Interim Abandonment Plan to EPA on November 30, 2022, as required in EPA Letter 291. The plan was revised, renamed as the Interim Containment Action Plan, and resubmitted to EPA on December 18, 2022, to address comments provided by EPA in EPA Letter 294. That plan was modified and conditionally approved by EPA on December 21, 2022, in EPA Letter 295.
- The Dairy has completed the implementation of the Interim Containment Action Plan. That work was completed between late December 2022 and February 13, 2023.

Anchor QEA submitted a draft Final Abandonment Plan to EPA on December 30, 2022, and is awaiting comments. The plan addresses methods for final lagoon abandonment. Final lagoon abandonment includes construction and maintenance of an evapotranspiration cap, run-on controls and runoff collection and pump-out facilities to prevent infiltration of precipitation or other waters into the soils beneath the former lagoons. The plan provides protection of groundwater resources from potential leaching of nitrogen from subsurface soils beneath the lagoons and complies with lagoon abandonment requirements of Washington's current CAFO permit applicable to large dairy facilities.

3.6.2.2 Operations and Maintenance of Existing Lined Lagoons

Liberty Dairy performs routine weekly inspections of its lined lagoons (Consolidated Lagoon No. 15, Lagoon No. 14, the Red Water Pond, Consolidated Lagoon No. 10, Consolidated Lagoon No. 7, Lagoon No. 6, and Consolidated Lagoon No. 4) as described in the *Uniform Lagoon Operations, Maintenance, and Monitoring Plan – Bosma and DeRuyter Dairies* (Anchor QEA 2020). The routine inspections include visual inspections of the following:

- The liner for evidence of slumps of bulges
- Damage to the liner (e.g., holes, tears, or damaged seams)
- The perimeter of the lagoon, looking specifically for signs of access from animals or workers, damage to fencing/barrier, presence of trees or vegetation, wind damage, or rodent activity
- The embankments, looking for signs of erosion
- Inlet and outlet piping to check for obstructions or damage
- Accumulation of solids in the lagoon
- The agitation equipment to ensure that it is properly secured with the tethered lines and positioned away from the side slopes and bottom of the lagoon
- Gas venting piping to check for obstructions or damage

Records of the weekly inspections conducted in 2022 are included in Appendix B.

During 2022, the Dairy also completed biennial electronic leak detection surveys at six of the seven existing lined lagoons (the seventh lagoon is not due for a leak detection survey until 2023). These surveys were provided to EPA as part of monthly progress reporting and are also contained in Appendix B. The surveys reference the Dairy's updated lagoon numbering system as follows:

- Lagoon No. 1 (f.k.a. Consolidated Lagoon Nos. 15, 16, and 17): Two small punctures were detected in the above-water portions of the lagoon. No leaks were detected in the below-water portions of the lagoon. Both punctures were repaired and retested and meet specifications.
- Lagoon No. 2 (f.k.a. the Red Water Pond): Two small tears were detected in the above-water portions of the lagoon. No leaks were detected in the below-water portions of the lagoon. Both punctures were repaired and retested and meet specifications.
- Lagoon No. 3 (f.k.a. Lagoon No. 14): No leaks were detected in above-water or below-water portions of the lagoon.
- Lagoon No. 4 (f.k.a. Consolidated Lagoon Nos. 7 and 12): One small puncture was detected in the above-water portion of the lagoon. No leaks were detected in the below-water portions of the lagoon. The puncture was repaired and retested and meets specifications.
- Lagoon No. 5 (f.k.a. Consolidated Lagoon Nos. 10, 11, and 13): Six small punctures were detected in the above-water portion of the lagoon. One leak was detected in the below-water portion of the lagoon. The six above-water punctures were repaired and retested and meet

specifications. The one below-water leak was mapped for repair when the lagoon is next emptied.

- Lagoon No. 6 (f.k.a. Lagoon 6): Four small punctures were detected in the above-water portions of the lagoon. No leaks were detected in the below-water portion of the lagoon. The four above-water punctures were repaired and retested and meet specifications.

3.6.2.3 Submittals and Approvals

In 2022, Liberty/H&S Bosma Dairies submitted the following documents related to lagoon construction:

- *Liberty Dairy and H&S Bosma Dairy Plan for 2022 Lagoon Abandonments* (Anchor QEA 2022b) – Submitted January 3, 2022
- *H&S Bosma Dairy Lagoon No. 3 Abandonment Plan* (Anchor QEA 2022c) – Submitted January 18, 2022
- *H&S Bosma Dairy Lagoon No. 6 and Consolidated Lagoon No. 10 Completion Report* (Updated) (Anchor QEA 2022d) – Submitted February 16, 2022
- *H&S Bosma Dairy Consolidated Lagoon No. 4 Completion Report* (Anchor QEA 2022e) – Submitted February 22, 2022
- *H&S Bosma Dairy Lagoon Nos. 1, 2, and 3 Abandonment Plan* (Anchor QEA 2022f) – Submitted April 25, 2022
- *Liberty Dairy Lagoon No. 18 Lagoon Abandonment Completion Report* (Anchor QEA 2022g) – Submitted May 16, 2022
- *H&S Bosma Dairy Progress of Bosma Lagoon 1, 2, and 3 Soil Testing* (Anchor QEA 2022h) – Submitted August 10, 2022
- *H&S Bosma Dairy Lagoon Nos. 1, 2, and 3 Interim Abandonment Plan* (Anchor QEA 2022i) – Submitted November 30, 2022
- *H&S Bosma Dairy Lagoon Nos. 1, 2, and 3 Interim Containment Action Plan* (Anchor QEA 2022j) – Submitted December 18, 2022
- *H&S Bosma Dairy Lagoon Nos. 1, 2, and 3 Final Abandonment Plan* (Anchor QEA 2022k) – Submitted December 30, 2022

The following documents related to Liberty/H&S Bosma Dairies lagoons were approved by EPA in 2022:

- *Liberty Dairy Consolidated Lagoon No. 15 Completion Report* (Anchor QEA 2021a) – Approved January 5, 2022
- *Liberty Dairy Red Water Pond Completion Report* (Anchor QEA 2021b) – Approved January 5, 2022
- *H&S Bosma Dairy Lagoon No. 6 and Consolidated Lagoon No. 10 Completion Report* (Updated) (Anchor QEA 2022d) – Approved February 17, 2022

- *H&S Bosma Dairy Lagoon No. 6 Basis of Design Report 100% Design Submittal* (Anchor QEA 2019) – Approved November 17, 2022
- *Liberty Dairy Red Water Pond Basis of Design Report Final Design Submittal* (Anchor QEA 2018a) – Approved November 17, 2022
- *Liberty Dairy Red Water Pond Operations, Maintenance, and Monitoring Plan* (Anchor QEA 2018b) – Approved November 17, 2022
- *H&S Bosma Dairy Lagoon Nos. 1, 2, and 3 Interim Containment Action Plan* (Anchor QEA 2022j) – Approved December 21, 2022

Leak detection survey reports submitted to EPA in 2022 include those contained in Appendix B.

3.6.3 George DeRuyter & Son/D&A Dairies

George DeRuyter & Son/D&A Dairies elected to line their manure storage lagoons with the same double-liner system used at the Liberty/H&S Bosma Dairies. That system includes an HDPE liner placed over the top of a GCL. Leak detection surveys for the upper liner are performed using a combination of visual and electronic leak detection surveys in alternating years.

In 2022, George DeRuyter & Son/D&A Dairies completed the lining of one lagoon (George DeRuyter & Son Dairy Lagoon No. 1). The Dairy initiated the abandonment of the D&A Dairy Take-Up Pond in 2021 and completed the abandonment in June 2022. This work completed the Dairies' activities toward upgrading their lagoon network to optimize the storage capacity and configuration of their lagoon system, with expansions, consolidations, and abandonments where appropriate. To date, this has also included the consolidation and lining of Lagoon Nos. 3 and 4 at D&A Dairy in 2017, the consolidation and lining of Lagoon Nos. 1 and 2 at D&A Dairy in 2020, the expansion of the Stormwater Catch Basin at George DeRuyter & Son Dairy in 2018, and the abandonment of the Take-Up Pond. During 2020 the Dairy also consolidated and lined two additional lagoons and abandoned a third lagoon not regulated on the Consent Order. The upgraded manure digestor and DAF unit remained operational. The Dairy also continued to operate a nitrification/denitrification (NDN) treatment system to reduce nitrogen concentrations in the Dairy's liquid manure.

Lagoon lining activities for 2022 are described in more detail in Section3.6.3.2. The status of the George DeRuyter & Son/D&A Dairies Consent Order lagoon program is summarized in Figure 3. The completion of the lining and abandonment activities described herein at George DeRuyter & Son/D&A Dairies has resulted in a reduction in the total number of lagoons regulated under the Consent Order from 10 to 7. The number of other lagoons not regulated under the Consent Order has similarly been reduced from three to one.

3.6.3.1 Manure Digester, DAF, and NDN Treatment System

The George DeRuyter & Son Dairy three-lane manure digester remains in successful operation. Repairs and upgrades to the digester were completed in 2019, in coordination with Regenis, an experienced digester company, and Promus Energy LLC, a sustainable biofuels marketing company. The digester has been in continuous biogas production since that time. In mid-2021 a gas pipeline was extended to the Dairy to allow direct injection of the finished biogas into the pipeline system without trucking requirements. The digester was operational throughout the year with the exception of short downtimes of less than 5% for repairs or maintenance.

The NDN system was fully operational until taken offline in November 2021 to facilitate the lining of the lagoon that contains the NDN system (Lagoon No. 1). The NDN system is scheduled to be reinstalled and brought back online in spring 2022. While the NDN is fully operational, it is used to treat approximately 90% of the Dairy's manure. NDN treatment is not performed for manure during periods when the digester or DAF are offline for repairs or maintenance.

As of year-end 2022, the digester and DAF remain in good operation. All gas-cleaning equipment is operational. Low-carbon biogas is cleaned and injected into the on-site gas pipeline. Construction of the gas line extension project to allow this direct injection was completed in October 2021.

3.6.3.2 Lining Design and Implementation for George DeRuyter & Son Lagoon No. 1

The lining for Lagoon No. 1 at George DeRuyter & Son Dairy was initiated during 2021 and was completed in 2022. The Dairies submitted initial design documents to support the lining of this lagoon (along with the lining of George DeRuyter & Son Dairy Lagoon Nos. 2 and 3) in June 2021. The design was rejected by EPA because it did not include the required pre-design soil sampling data. These data were subsequently collected and the plan was resubmitted. After several iterations, the plan was approved by EPA on January 19, 2022.

Construction activities at George DeRuyter & Son Dairy Lagoon No. 1 were initiated in December 2021 after completion of Lagoon No. 2. The lining of Lagoon No. 1 was ultimately completed on June 8, 2022. A completion report for Lagoon No. 1 was submitted to EPA on July 8, 2022.

3.6.3.3 Abandonment of the D&A Dairy Take-Up Pond

The D&A Dairy Take-Up Pond is no longer required for manure storage. A draft abandonment plan for the Take-Up Pond was submitted to EPA for review in June 2021. After several iterations, a revised abandonment plan was submitted to EPA and approved in late December 2021 (see Section 3.6.3.5).

Manure was removed from the Take-Up Pond by the Dairy by December 17, 2021. Anchor QEA then collected samples of the lagoon sidewalls and bottom soil. These data were submitted to EPA in January 2022 along with an excavation plan. Excavation of between 1.5 and 3.5 feet of nutrient-rich soil from portions of the lagoon was completed in late January 2022. Final abandonment was completed in June 2022 with the backfilling of the lagoon with the former lagoon berms and additional clean soil. A completion report was submitted to EPA on July 8, 2022, and was approved on November 17, 2022.

3.6.3.4 Operations and Maintenance of Existing Lined Lagoons

In 2022, D&A Dairy and George DeRuyter & Son Dairy performed routine weekly inspections of Consolidated Lagoon No. 3; the Stormwater Catch Basin; Consolidated Lagoon No. 1; Lagoon No. 4; and Lagoon Nos. 1, 2, and 3 as described in the *Uniform Lagoon Operations, Maintenance, and Monitoring Plan – Bosma and DeRuyter Dairies* (Anchor QEA 2020). The routine inspections include visual inspections of the following:

- The liner for evidence of slumps of bulges
- Damage to the liner (e.g., holes, tears, or damaged seams)
- The perimeter of the lagoon, looking specifically for signs of access from animals or workers, damage to fencing/barrier, presence of trees or vegetation, wind damage, or rodent activity
- The embankments, looking for signs of erosion
- Inlet and outlet piping to check for obstructions or damage
- Accumulation of solids in the lagoon
- The agitation equipment to ensure that it is properly secured with the tethered lines and positioned away from the side slopes and bottom of the lagoon
- Gas venting piping to check for obstructions or damage

Records of the weekly inspections conducted in 2022 are included in Appendix B.

During 2022, the Dairy also completed biennial electronic leak detection surveys at six of the seven existing lined lagoons (the seventh lagoon is not due for a leak detection survey until 2023). These surveys were provided to EPA as part of monthly progress reporting and are also contained in Appendix B:

- D&A Consolidated Lagoon No. 3: Three small punctures were detected in the above-water portions of the lagoon. All three punctures were repaired and retested and meet specifications. One anomaly was detected in the below-water portion of the lagoon. The anomaly was associated with an outlet pipe end (also noted during a previous survey) and did not represent a leak (outlet pipes can transmit electrical current resulting in a false positive result during the test).

- George DeRuyter & Son Dairy Lagoon No. 4: Four small punctures were detected in the above-water portions of the lagoon. No leaks were detected in the below-water portions of the lagoon. All four punctures were repaired and retested and meet specifications.
- George DeRuyter & Son Dairy Stormwater Catch Basin: No punctures were detected in the above-water portions of the lagoon. No leaks were detected in the below-water portions of the lagoon.

During 2022, the Dairy also completed a leak detection survey for the non-Consent Order lagoon (George DeRuyter & Son Dairy Heifer Area Catch Basin) that was lined in 2020. Four small punctures were detected in the above-water portions of the lagoon. No leaks were detected in the below-water portions of the lagoon. All four punctures were repaired and retested and meet specifications.

3.6.3.5 Submittals and Approvals

George DeRuyter & Son/D&A Dairies submitted the following documents related to lagoon construction activities in 2022:

- *George DeRuyter & Son Dairy Lagoon Nos. 1, 2, and 3 Project-Specific Liner Construction Plans* (Anchor QEA 2022l) – Submitted January 12, 2022
- Soil Testing Data – D&A Dairies Take-Up Pond Soil Sampling Results Letter (Anchor QEA 2022m) – Submitted January 17, 2022
- Soil Testing Data – D&A Dairies Take-Up Pond Soil Sampling Results Revised Letter (Anchor QEA 2022n) – Submitted January 20, 2022
- *George DeRuyter & Son Dairy Lagoon Nos. 2 and 3 Completion Report* (Anchor QEA 2022o) – Submitted February 23, 2022
- *D&A Dairy Take-Up Pond Lagoon Abandonment Completion Report* (Anchor QEA 2022p) – Submitted July 8, 2022
- *George DeRuyter & Son Dairy Lagoon No. 1 Completion Report* (Anchor QEA 2022q) – Submitted July 8, 2022

The following documents related to George DeRuyter & Son/D&A Dairies lagoons were approved by EPA in 2022:

- *D&A Dairy Consolidated Lagoon No. 3 Completion Report* (Anchor QEA 2021c) – Approved January 5, 2022
- *George DeRuyter & Son Dairy Stormwater Catch Basin Completion Report* (Anchor QEA 2021d) – Approved January 5, 2022
- *D&A Dairy Take-Up Pond Lagoon Abandonment Completion Report* (Anchor QEA 2022p) – Approved November 17, 2022 (EPA Letter 292)

Leak detection survey reports submitted to EPA in 2022 include those contained in Appendix B.

4 Groundwater Monitoring Program

The Consent Order requires 8 years of quarterly groundwater monitoring, which was completed in Second Quarter 2021. Under the Consent Order, this 8-year monitoring period is to be followed by data evaluation and a formal determination of next steps. This data evaluation process is in progress.

Pending completion of the data evaluation process and definition of next steps under the Consent Order, EPA and the Dairies exchanged correspondence regarding the value of conducting continued groundwater monitoring. The Dairies made a written proposal to conduct ongoing monitoring in a letter to EPA dated October 4, 2021, and in follow-up letters dated November 11, 2021, and December 10, 2021. In the December 10, 2021, letter, the Dairies informed EPA that they planned to voluntarily perform groundwater monitoring for the foreseeable future.

EPA responded to the proposal from the Dairies for continued voluntary groundwater monitoring on January 25, 2022. In that letter, EPA stated that the Consent Order did not require continued groundwater monitoring but that it was in line with the goals of the Consent Order. Therefore, beginning in Fourth Quarter 2021, voluntary groundwater monitoring was commenced with continued groundwater elevation monitoring at all 26 site wells and groundwater sampling for nitrate only. Due to the ongoing negotiations at that time, no groundwater monitoring was conducted in Third Quarter 2021. Voluntary groundwater monitoring was conducted in Fourth Quarter 2021 and all four quarters of 2022.

The monitoring well network at the Dairies (Figure 1 and Table 3) consists of 26 monitoring wells screened in the surficial aquifer. Most of the wells (23 wells) are screened across the water table. The remaining wells (3 wells) are deeper wells that are paired with water table wells.

Figures 4 and 5 summarize potential on-site sources of nitrogen at the Dairies and identify key transport mechanisms and exposure pathways. The monitoring well network serves as a tool to evaluate how the aquifer is responding to actions taken to control these potential sources and transport pathways. The groundwater monitoring data are used by EPA to supplement and verify existing information at the Dairies.

A list of the wells in the network and well construction data are shown in Table 3 and are detailed as follows:

- Seven of the wells were installed by EPA in 2012 (EPA wells; identified as DC-01, DC-03, DC-04, DC-05, DC-07, DC-09, and DC-14).
- The remaining 19 wells were installed by the Dairies in 2013 (Consent Order wells; identified as YVD-02, YVD-03, YVD-04, YVD-05, YVD-06, YVD-07, YVD-08, YVD-09, YVD-10, YVD-11, YVD-12, YVD-13, YVD-14R, YVD-15, YVD-16, YVD-17, YVD-18, DC-03D, and DC-05D), except for well YVD-14R, which is a replacement for well YVD-14, originally installed by the Dairies in 2013.

4.1 Groundwater Monitoring Quality Assurance Project Plan

In 2022, groundwater monitoring was conducted according to the updated *Groundwater Monitoring QAPP* (Anchor QEA 2018c), which was conditionally approved by EPA on February 28, 2018.

According to the 2018 *Groundwater Monitoring QAPP* (Anchor QEA 2018c), 16 of the Consent Order wells are monitored quarterly and 10 are monitored annually to assess nitrate concentrations and groundwater chemistry in the surficial aquifer. As of Third Quarter 2019, upgradient monitoring well YVD-02 was moved from the annual schedule to the quarterly monitoring schedule due to elevated nitrate concentrations detected in that well in Second Quarter 2019. However, due to the redirecting of an irrigation ditch into underground piping, YVD-02 has been dry since Third Quarter 2020, and no groundwater samples could be collected in 2022. Beginning in Third Quarter 2020, quarterly sampling was resumed at well DC-07 due to elevated nitrate concentrations detected in that well during Second Quarter 2020.

4.2 Well Installation and Maintenance

In 2022, no groundwater monitoring well installations or replacements were required.

Monitoring well YVD-02 was dry during all four quarters of 2022. YVD-02 is screened in a shallow basalt layer and is located just downgradient of a former irrigation canal. Groundwater elevations decreased in this well following replacement of the open canal with an enclosed irrigation pipeline. The well subsequently became dry and has not had sufficient water to allow sampling since Second Quarter 2020. YVD-02 is checked during each quarterly monitoring event and will continue to be sampled if sufficient water is present.

4.2.1 Dedicated Bladder Pumps

In 2017, dedicated bladder pumps were installed in each groundwater well. During 2022, all bladder pumps remained operational, and no changes to the sampling methodology were required.

4.2.2 Monitoring Well Pressure Transducers

Continuous long-term groundwater elevations are being monitored using non-vented Solinst Levelogger Junior Edge pressure transducers in six monitoring wells to evaluate seasonal fluctuations and trends in groundwater elevations. Two pressure transducers were installed in one of the shallow/deep monitoring well pairs to evaluate differences in hydraulic head and vertical gradients between the shallow and deep portions of the surficial aquifer. Wells with transducers installed originally included the following:

- DC-03
- DC-05/DC-05D well pair
- YVD-03

- YVD-08
- YVD-11

Additionally, a Solinst Barologger Edge barometric pressure transducer is deployed at well YVD-08 to compensate water levels for atmospheric pressure.

Transducers recorded water levels in hourly increments from 12:00 p.m. on October 15, 2013, through 8:00 a.m. on December 7, 2020. Beginning at 8:45 a.m. on December 7, 2020, the transducers began recording water levels in 15-minute increments to provide more accurate calibration with manual depth-to-water measurements. During data downloads, depths to water in wells were manually measured using an electronic water level meter.

Whether ongoing transducer data will be required in the future has not been resolved with EPA. Due to equipment malfunctions, DC-03 is the only well with a functioning transducer as of December 2022. The status of the other wells is as follows:

- The suspension lines used to hang the transducers in wells YVD-03 and YVD-08 broke during the Fourth Quarter 2020 groundwater monitoring event, and the transducers fell to the bottom of the wells. Recovery of the transducers has not been possible with either hooks or magnets due to stainless-steel weights placed on top of the transducers to properly position them. To date, the transducers have not been replaced in the wells, and no current data are available.
- The transducers in wells DC-05, DC-05D, and YVD-11 would not connect to the downloading device, either in the field or in the office. The transducers were returned to the manufacturer for data retrieval and have not been replaced in the wells.

4.3 Quarterly Groundwater Monitoring Data Reports

During 2022, quarterly groundwater monitoring events were conducted as follows:

- First Quarter 2022 – March 14 to March 15, 2022
- Second Quarter 2022 – June 5 to June 8, 2022
- Third Quarter 2022 – September 12 to September 14, 2022
- Fourth Quarter 2022 – December 5 to December 8 and December 27 to December 28, 2022

In 2022, quarterly groundwater monitoring data reports were submitted to EPA as follows:

- *First Quarter 2022 Groundwater Monitoring Data Report* (Anchor QEA 2022r) – Submitted May 16, 2022
- *Second Quarter 2022 Groundwater Monitoring Data Report* (Anchor QEA 2022s) – Submitted August 15, 2022

- *Third Quarter 2022 Groundwater Monitoring Data Report* (Anchor QEA 2022t) – Submitted November 17, 2022
- *Fourth Quarter 2022 Groundwater Monitoring Data Report* (Anchor QEA 2023) – Submitted February 27, 2023

The quarterly groundwater monitoring data reports are included in Appendix C. Current and historical data are presented in the tables and figures of the quarterly reports and are also summarized in Section 4.4.

4.4 Summary of Findings

Historical groundwater chemistry data are presented in Table 4. Groundwater nitrate concentrations detected in 2022 for each well are presented in Figure 6. Historical groundwater elevations in the surficial aquifer from the beginning of monitoring in 2013 through 2022 are listed in Table 5. Surficial aquifer groundwater elevation contour maps for the four quarters in 2022 are presented in Figures 7a through 7d. Time-series trend plots of nitrate concentrations in groundwater from the beginning of monitoring in 2013 through Fourth Quarter 2022 are presented in Figures 8 through 12.

4.4.1 Groundwater Nitrate Monitoring

Results of the 2022 groundwater nitrate monitoring include the following:

- Nitrate concentrations in water table well DC-03 have decreased since First Quarter 2022 to a historically low concentration of 138 mg/L in Fourth Quarter 2022.
- Nitrate concentrations detected in 2022 at well DC-07 ranged from 6.20 mg/L in Fourth Quarter 2022 to 28.5 mg/L in Second Quarter 2022. Nitrate concentrations in well DC-07 were historically below the MCL between 2013 and Second Quarter 2020. Since Second Quarter 2020, the MCL has been exceeded 7 times out of 10 completed monitoring events. The change in groundwater nitrate concentrations at this well followed the termination of clean chiller water discharges to a ditch located upgradient of the well. That chiller water discharge was terminated in late 2018. During the past nine monitoring events from Third Quarter 2020 to Fourth Quarter 2022, the measured nitrate concentrations in well DC-07 have averaged 16.4 mg/L. This is very similar to the average nitrate concentration in the well located immediately east (well YVD-15, average nitrate concentration 18.5 mg/L) during the same time period. Groundwater nitrate concentrations in this well show a seasonal fluctuation that mirrors changes in groundwater elevation (this well is within the area where groundwater elevations are influenced by the nearby irrigation canal).
- Nitrate concentrations detected in 2022 at well DC-14 ranged from 48.8 mg/L in First Quarter 2022 to 57.4 mg/L in Second Quarter 2022. Between 2013 and June 2016, the nitrate concentrations in this well were highly variable, ranging from a low of 5.8 mg/L to a high of 26.0 mg/L. After a permanent pump was installed in the well prior to the September 2016

monitoring event, the groundwater nitrate concentrations decreased to below the MCL, reaching a minimum concentration of 2.41 mg/L in June of 2017. Nitrate concentrations have increased steadily quarter over quarter between September 2017 to a maximum concentration of 57.4 mg/L in Second Quarter 2022. During this same time period, groundwater elevations decreased approximately 7.0 feet in well DC-14.

- Nitrate concentrations in water table well DC-05 have historically been greater than co-located deeper well DC-05D; however, in Fourth Quarter 2022 their concentrations were nearly equal. The nitrate concentrations in DC-05 have decreased from 41.7 mg/L in Second Quarter 2022 to 10.0 mg/L in Fourth Quarter 2022. Similarly, the nitrate concentrations in DC-05D have been below the MCL since Second Quarter 2022 after 6 consecutive years above the MCL.
- Nitrate concentrations in four of the five northern downgradient wells (DC-09, YVD-05, YVD-06, and YVD-07) and three of the four upgradient wells (DC-01, YVD-03, and YVD-04) have remained below the nitrate MCL since Third Quarter 2016 and Second Quarter 2015, respectively. The fourth upgradient well (YVD-02; completed in perched water above a shallow bedrock layer) has been dry since late 2020. This well ran dry following the piping of an adjacent irrigation return water canal that eliminated the source of the perched water in this area.
- Nitrate concentrations have been consistently below the nitrate MCL in downgradient well YVD-17 since the beginning of the monitoring program.

4.4.2 Groundwater Nitrate Concentration Trend Analysis

An analysis of groundwater nitrate observations from 2013 through 2022 was conducted. This included several steps. First, the changes in the groundwater plume characteristics were evaluated using isoconcentration contour maps. Figure 13a illustrates the maximum concentrations and extent of the nitrate plume based on the highest running average (average of four consecutive monitoring events). Figure 13b then illustrates the most frequent running average nitrate concentration (average of the four 2022 monitoring events).

The second analysis method included groundwater trend analysis. The trend analysis was conducted in Pro UCL using the Mann-Kendall trend analysis method to assess whether the apparent trends are statistically significant. This is a non-parametric method widely used for groundwater trend analysis. Based on the observed nitrate concentration patterns in each well the trend analysis was conducted in one of two ways. Where there was no apparent change in groundwater trend direction, the analysis was performed using all available data. In cases where there was an apparent change in groundwater trend direction (i.e., an increasing trend followed by decreasing trend), the trend analysis was performed using all data from the apparent point of trend reversal. Table 6 summarizes the data used in the analysis and the trend observations for each well. A summary of current nitrate trends is

presented graphically in Figure 14. Nitrate concentration trend plots of the Consent Order wells are presented in Figures 15a through 15c for the central, eastern, and western wells, respectively.

Results of the trend analysis indicate the following trends in nitrate concentrations as of year-end 2022:

- Upgradient wells (4): Three upgradient wells exhibited nitrate concentrations consistently below the MCL during the most recent four sampling events. The fourth upgradient well (YVD-02) has been dry for the past nine monitoring events. None of the upgradient wells exhibited an increasing trend.
- Downgradient water table wells (19):
  - Five downgradient wells have been consistently below the MCL (DC-09, YVD-05, YVD-06, YVD-07, and YVD-17). None of these wells exhibit increasing trends.
  - Seven downgradient wells exhibit decreasing trends (DC-03, DC-04, DC-05, YVD-10, YVD-12, YVD-14R, and YVD-15). All of these wells had previously exhibited increasing trends.
  - Four downgradient wells exhibit stable trends that are neither increasing nor decreasing (DC-07, YVD-08, YVD-11, and YVD-16). Well YVD-08 previously exhibited an increasing trend. This trend stabilized following reduction of application field nitrogen concentrations and lining of nearby manure lagoons.
  - Three downgradient wells exhibit increasing trends (DC-14, YVD-09, and YVD-13). Well YVD-13 is located in an area with a thick overlying silt layer. It may be responding with a lag to higher groundwater nitrate concentrations in adjacent areas. Groundwater elevations in well DC-14 have decreased substantially over the past four years. This change may be affecting observed nitrate concentrations as described previously. Well YVD-09 remains within its historic range of nitrate concentrations, but the Mann-Kendall analysis identifies the trend as increasing when all data are used in the analysis.
- Deeper wells (3): All three deeper wells exhibit stable trends (DC-03D, DC-05D, and YVD-18). Of these wells, YVD-18 previously exhibited an increasing trend that has since stabilized.

4.4.3 Site Hydrogeology

4.4.3.1 Groundwater Flow Direction and Horizontal Hydraulic Gradients

Groundwater in the surficial aquifer flows in a northeast to southwest direction with little seasonal change in hydraulic gradient. In 2022, the average hydraulic gradient from the topographically higher areas in the northern part of the site to the southern part of the site was 0.013 (foot per foot), with an average of 0.026 in the topographically higher area upgradient of the Dairies, 0.011 in the central area of the site, and 0.0042 in the topographically lower area downgradient of the Dairies.

4.4.3.2 Vertical Hydraulic Gradients

Vertical gradients in 2022 at the three shallow/deep well pairs (DC-03/DC-03D, DC-05/DC-05D, and YVD-13/YVD-18) were consistently upward at well pairs DC-03/DC-03D and YVD-13/-18 and downward at well pair DC-05/-05D. The vertical gradients have been more variable in the previous years, with sporadic fluctuations between upward and downward vertical gradients at all three well pairs. The variable vertical gradients may be caused by periodic pumping cycles from domestic and irrigation wells in the vicinity.

4.4.3.3 Seasonal Groundwater Elevation Patterns

The hydrographs for many of the monitoring wells show a seasonal pattern of water level increases and decreases. For example, the water level in monitoring well YVD-02 historically increased about 12 feet from first quarter to second quarter before an adjacent irrigation ditch was converted to a closed pipe, after which the seasonal pattern became less pronounced.

Another example of seasonal water level fluctuation is observed in well YVD-17, which is located adjacent to the large, unlined Southside irrigation canal run by the Sunnyside Valley Irrigation District. According to the District fact sheet, irrigation usually runs from April 1 through October 20 with canal priming operations beginning in mid-March. The water elevation in YVD-17 varies seasonally by about 6 feet. The lowest water level of each year has consistently occurred in the first quarter (approximately April 1), and the highest water level of each year has consistently occurred in the third quarter (approximately October 1). This suggests that the travel time of water from the flowing irrigation canal to the relatively shallow drinking water aquifer at YVD-17 is likely in the range of days to weeks.

EPA has concluded that the seasonal fluctuations observed at monitoring wells indicate that percolation of water from the land surface to the aquifer in the vicinity of the Dairies can and does occur in a range of days to months. The time of travel depends on many factors including the soil type, existing amount of water in the soil, the duration and amount of water, evapotranspiration, and depth to the water table. The percolating water could originate from surface water such as a canal or pond, excess irrigation water from a field, an earthen lagoon, precipitation, or some other source. The groundwater elevation seasonal patterns for each monitoring well are shown in the figure included in Appendix D and in the following table:

Monitoring Well ID	Clear Seasonal Pattern? (Y/N)	Well Depth from Ground Surface to Midpoint of Screen (feet)	Highest Groundwater Elevation in 3Q (Fall) and Lowest in 1Q (Spring)	Highest Groundwater Elevation in 4Q (Winter) and Lowest in 2Q (Summer)	Highest Groundwater Elevation in 1Q (Spring) and Lowest in 3Q (Fall)
YVD-02	Y	25	X		
YVD-17	Y	38	X		

Monitoring Well ID	Clear Seasonal Pattern? (Y/N)	Well Depth from Ground Surface to Midpoint of Screen (feet)	Highest Groundwater Elevation in 3Q (Fall) and Lowest in 1Q (Spring)	Highest Groundwater Elevation in 4Q (Winter) and Lowest in 2Q (Summer)	Highest Groundwater Elevation in 1Q (Spring) and Lowest in 3Q (Fall)
DC-04	Y	40	X		
DC-07	Y	49		X	
DC-03	Y	73	X		
DC-05	Y	74		X	
YVD-14R	Y	81		X	
YVD-10	Y	93			X
YVD-15	Y	95		X	
YVD-11	N	107			
DC-03D	Y	111	X		
YVD-09	N	112			
YVD-16	Y	112			X
DC-05D	Y	122		X	
YVD-13	Y	131		X	
DC-14	N	139			
YVD-12	Y	141			X
DC-01	N	150			
YVD-07	Y	158			X
YVD-06	Y	159			X
YVD-05	Y	172			X
YVD-08	Y	172			X
YVD-18	Y	175		X	
DC-09	Y	184			X
YVD-03	Y	190			X
YVD-04	Y	235			X

5 Actions to Ensure Effective Nutrient Management

Section III.F.1 and Section III.F.2 of the SOW describe immediate nitrate source control actions. Per Section III.F.1, each Dairy must submit a Dairy Facility Application Field Management Plan (AFMP) to EPA and conduct pre-plant and post-harvest soil sampling, with the goal of reducing the soil nitrate level to below 45 parts per million (ppm) at the 2-foot depth. Per Section III.F.2, each Dairy must submit an Irrigation Water Management Plan (IWMP) to EPA and install flow meters and moisture sensors with the goal of minimizing water movement below the root zone.

Per Section III.F.1 of the SOW, pre-plant and post-harvest soil sampling is required for application fields for the period of fall 2013 through spring 2022 ("six months and twelve months after the Effective Date of the Consent Order and within a month of the anniversaries of those dates for eight years"). Since spring 2022, the Dairies conducted voluntary monitoring of application fields consistent with requirements outlined in the Ecology CAFO General Permit, using the same soil testing procedures as previously performed under the Consent Order. This annual report summarizes data collected both under the Consent Order (spring 2022) and under the CAFO permit monitoring (fall 2022).

As of fall 2022, 97% of the 34 application fields at the three Dairies complied with the 45-ppm target for the 2-foot depth interval (12 to 24 inches). Spring and fall nitrate concentrations in all application fields at Cow Palace Dairy remained below the 45-ppm target at the 2-foot depth interval (12 to 24 inches). Spring nitrate concentrations were below the 45-ppm target in all Liberty/H&S Bosma Dairies fields except in field LD-SU07. By fall, all application fields at Liberty/H&S Bosma Dairies were below the 45-ppm target. Spring nitrate concentrations were below the 45-ppm target in all George DeRuyter & Son/D&A Dairies fields; however, in fall, one application field at George DeRuyter & Son/D&A Dairies exceeded the 45-ppm target (GDS-SU04, 47 ppm nitrate; Figure 16).

During 2022, many of the soil moisture sensors installed in the manure application fields were repaired and upgraded to address operational problems.

5.1 Application Fields

The use of an agronomic rate to guide nutrient applications was the primary management tool used to achieve the goal of reducing nitrate at the 2-foot depth in each application field to less than 45 ppm. To calculate an agronomic rate, dairy nutrient sources are evaluated (through sampling and analysis procedures described in the updated *Dairy Facility AFMP* [Anchor QEA 2018d] or equivalent sampling performed under CAFO permit requirements) for total nitrogen, which principally includes ammonium nitrogen, nitrate nitrogen, and organic nitrogen. Other potential sources of nutrients, such as organic matter, irrigation water, crop residue, and past manure applications, are established through sampling and calculation and accounted for in the calculation of an agronomic rate.

Following application, only a portion of the nitrogen measured in the dairy nutrient sources is available to the crop during the growing season. Available nitrogen is calculated using the nutrient source parameters. Residual soil nitrogen is measured by soil sampling and is a critical component of an agronomic rate. Due to variation in crop physiology and rooting depth, not all of the measured residual nitrogen within the soil will be available to the growing crop over the season. Therefore, some of the nitrogen is considered to be "positionally unavailable" or "not accessible."

As the crop develops, in-season adjustments are sometimes made using tissue samples (petioles) or soil samples. These samples can be taken to assess if current nutrient availability will be sufficient to meet crop needs to finish out the crop. If it is determined that additional nitrogen will be required to meet crop demand, then the initial agronomic rate is adjusted. An agronomic rate should not be considered to be an absolute maximum or minimum, as in-season dynamics can change. However, if applications are made outside of these parameters, then documentation of the reasons for the change in rate are required.

Manure nutrient contents measured for various liquid and solid manure sources for pre-plant and post-harvest are summarized for each Dairy in Tables 7a to 7d (Cow Palace Dairy), Tables 8a to 8d (Liberty/H&S Bosma Dairies), and Tables 9a to 9d (George DeRuyter & Son/D&A Dairies). Other nutrient management activities and results are further described for each Dairy in Sections 5.3, 5.4, and 5.5.

5.2 Irrigation Water Management

Section III.F.2 of the SOW requires that each Dairy must submit an IWMP to EPA and install flow meters and moisture sensors with the goal of minimizing water movement below the root zone.

As described in the IWMPs, at each Dairy, a system of data loggers and moisture sensors was installed within each field to help guide irrigation water applications with the goal of reducing the potential for the movement of water below the crop root zone. For this purpose, the crop root zone was conservatively assumed to be 2 feet deep. Figure 17 depicts an IWMP Conceptual Site Model (IES 2015a, 2015b, 2015c) that provides a simplified and general depiction of the forces and components involved within irrigated fields. However, it does not represent all the forces that can act on irrigation water within an irrigated system.

The Consent Order requires at least two soil moisture monitoring locations in each of the Dairies' 34 application fields. Each monitoring location, or "station," includes three sensors at different soil depths. Most fields have two sensor stations, and a some have three. The Dairies installed 82 moisture sensor stations in 2,303 acres of application fields, which on average is one station for every 28 acres. Table 10 summarizes the network of 82 irrigation sensor stations.

5.2.1 Sensor Installation and Maintenance

The maximum amount of water that is held in soil against the pull of gravity is referred to as the "field capacity" (NRCS 2017). The results of the field capacity testing and soil moisture monitoring station installation is described in the field capacity soil testing reports for irrigation water management (IES 2015a, 2015b, 2015c).

Agrimanagement completed testing in September and October 2014 to establish field capacities of application field soils. Pessl iMetos data loggers with Decagon[1] moisture sensors were installed during November 2014. Separate sensors were installed at 1 foot below ground surface (bgs), 2 feet bgs, and 3 feet bgs. The moisture sensors measure the volumetric water content (VWC; water volume divided by soil volume). As shown on the example provided in Figure 18, the VWC at 1 foot bgs is generally more variable during precipitation or irrigation compared to the VWC at 2 feet and 3 feet bgs. The VWC at 2 feet and 3 feet bgs is more gradual in response to the rainfall or irrigation event.

Data are collected from the moisture sensors on an hourly basis and transmitted up to four times per day via cell modem to a web application. These data are evaluated once per week, and field-specific recommendations are provided. In the event field capacity is exceeded at the 3-foot depth, the web application sends a text notification to the professional irrigation consultant (Agrimanagement) and to farm managers to notify them that field capacity has been exceeded.

During 2022, the Dairies conducted repairs and upgrades to fix soil moisture sensors that had been damaged during harvest operations or that were inoperable due to equipment malfunctions. As of January 2023, the type of cellular service relied on for some of the data loggers was discontinued by the cell service provider. Agrimanagement is working with the Dairies and EPA to replace the affected loggers with new ones compatible with current cellular service availability prior to the start of the irrigation season in spring 2023.

5.2.2 Irrigation Monitoring Results

During 2022, the irrigation season extended from early April through mid-October. The weather experienced during the 2022 irrigation season was characterized by below-average temperatures for most of April, May, and June, but temperatures were fairly average in July and August and slightly above average in September and October. The lower early season temperatures along with spring rains resulted in delayed crop development, which required lower irrigation rates. The mid-to-latter summer temperatures were more typical, but precipitation was well below average.

The Consent Order requires at least two moisture monitoring stations in each of the 34 fields (some fields have three). As noted in Section 5.2.1, some moisture sensor stations were undergoing repairs

[1] Decagon was bought by Meter Group, which all replacement sensors are now purchased from.

and replacement during the irrigation season. Table 10 summarizes information regarding each sensor location, including instances when exceedances of field capacity were measured at the 3-foot soil depth. Observations include the following:

- All 34 application fields had at least one operable sensor station for all or part of the irrigation season.
- Field capacity exceedances at the 3-foot soil depth per sensor were noted at a frequency of 1.3% across entire 2022 irrigation season for all Dairies combined (i.e., 98.7% of the measurements indicated soil moisture levels were maintained below field capacity at the 3-foot soil depth). Several of these exceedances appeared to be related to wet spring soils that were unrelated to irrigation events.

The 2022 moisture sensor data are described in individual season summary site reports for each field and are included in Appendix E.[2,3,4]

5.3 Cow Palace Dairy Application Fields

In 2022, pre-plant and post-harvest soil sampling was conducted by Agrimanagement at the seven application fields associated with Cow Palace Dairy from May 17 and 20, 2022 (pre-plant), and from September 9 to November 9, 2022 (post-harvest). Liquid and solid manure samples were collected on April 20, 2022 (pre-plant), and September 20, 2022 (post-harvest). A summary of 2022 pre-plant and post-harvest data is provided in Table 11. For the entirety of the 2022 season, nitrate concentrations in all application fields associated with Cow Palace Dairy were below 45 ppm at the 2-foot depth.

Cow Palace Dairy manure nutrient concentrations for total nitrogen (N), total ammonium (NH4), total phosphorus (P), and total potassium (K) from 2013 to 2022 are provided in Tables 7a, 7b, 7c, and 7d.

5.3.1 Soil Nitrate Level Summary

In 2022, based on soil sampling results collected, nitrate concentrations at the 2-foot depth interval were all below 45 ppm for both the pre-plant and post-harvest samplings.

The number of application fields with nitrate levels exceeding 45 ppm in the second foot from 2013 to 2022 is depicted in Figure 19. Average post-harvest soil nitrate concentrations measured in the seven application fields associated with Cow Palace Dairy have generally decreased since 2013 (Figure 20). From fall 2013 to fall 2022, nitrate concentrations have decreased by 56% in the first foot, 83% in the second foot, and 87% in the third foot. As discussed in Section 5.1, residual soil nitrogen

[2] In the line graph of each application field season report, the line between the green shading and the blue shading is field capacity at the third foot (or the green is the favorable zone, red is below favorable, and blue is above favorable).
[3] In the bar graph of each application field season report, the blue data bars represent precipitation. Overlapping data bars may appear darker (blue versus dark blue). To clarify, all blue bars represent precipitation.
[4] Certain application field season reports include notes regarding sensor performance during the season.

measured in each field is an important element in the development of the agronomic rate for that field. The 2022 season was the seventh full year where the nitrate concentrations were consistently below 45 ppm at the 2-foot depth interval.

5.3.2 Application Field Management

In 2022, in addition to agronomic rate, the following management tools and strategies were used toward achieving soil nitrate concentrations below 45 ppm at the 2-foot depth interval in application fields associated with Cow Palace Dairy:

- Improved application timing to better coincide with crop nutrient uptake
- In-season tissue and soil sampling to evaluate crop nutrient uptake progress

Overall, manure applications were well controlled, and as discussed in Section 5.3.1. All field nitrogen applications for 2022 were below the ranges recommended by Agrimanagement. 100% of the Cow Palace fields are in the "Low Risk" category (indicating a field with less than 15 ppm nitrate at the 2-foot depth interval) as defined in Washington's current CAFO permit.

5.3.3 Field Moisture Management

At Cow Palace Dairy there are a total of 17 moisture sensor locations in seven fields. In 2022, as discussed in Section 5.2.1, malfunctioning moisture sensor stations were repaired, replaced, and upgraded. The following is a summary based on available data:

- Two fields (CP-SU02 and CP-SU03) has no field capacity exceedances observed at the 3-foot soil depth through the entire 2022 irrigation season.
- Two fields (CP-SU01 and CP-SU05) had six field capacity exceedances observed at the 3-foot soil depth through the entire 2022 irrigation season.
- Three fields (CP-SU04A, CP-SU04B, and CP-SU06) had eight or more field capacity exceedances observed at the 3-foot soil depth through the entire 2022 irrigation season.
- Total field capacity exceedances observed at the 3-foot depth per sensor occurred at a frequency of 1.6% over the entire 2022 irrigation season (Table 10).

In response to the field capacity exceedances noted, water application to these fields was adjusted by turning the water off or by lengthening the time between planned applications until moisture levels decreased below field capacity. These adjustments resolved the issue.

5.4 Liberty/H&S Bosma Dairies Application Fields

In 2022, pre-plant and post-harvest soil sampling was conducted by Agrimanagement at the 13 application fields associated with Liberty/H&S Bosma Dairies from May 6 to June 20, 2022 (pre-plant), and from September 28 to October 27, 2022 (post-harvest). Liquid and solid manure

samples were collected on April 20, 2022 (pre-plant), and September 20, 2022 (post-harvest). A summary of 2022 pre-plant and post-harvest data is provided in Table 12.

Liberty Dairy manure nutrient concentrations for total N, total NH4, total P, and total K from 2013 to 2022 are provided in Tables 8a, 8b, 8c, and 8d.

5.4.1 Soil Nitrate Level Summary

The number of application fields with nitrate levels exceeding 45 ppm in the second foot from 2013 to 2022 is depicted in Figure 19. Average post-harvest soil nitrate concentrations measured in the 13 application fields associated with Liberty/H&S Bosma Dairies decreased substantially since 2013 (Figure 21). From fall 2013 to fall 2022, nitrate concentrations have decreased by 67% in the first foot, 76% in the second foot, and 67 in the third foot. As discussed in Section 5.1, residual soil nitrogen measured in each field is an important element in the development of the agronomic rate for that field.

Field LD-SU07 exceeded the 45-ppm nitrate goal during spring 2022 (Figure 16) but fell below the 45-ppm goal by fall 2022. This field was in a triticale-silage corn rotation. It is not clear what the reason was for the increase in the soil nitrate levels between fall 2021 and spring 2022, but appropriate agronomic adjustments were made that brought the nitrate levels back down prior to the fall 2022 sampling event.

5.4.2 Application Field Management

In 2022, in addition to agronomic rate, the following management tools and strategies were used toward achieving and maintaining soil nitrate concentrations below 45 ppm at the 2-foot depth interval in application fields associated with Liberty/H&S Bosma Dairies:

- Improved application timing to better coincide with crop nutrient uptake
- In-season tissue and soil sampling to evaluate crop nutrient uptake progress
- Rotation changes to provide application flexibility as well as increased nutrient uptake

Overall, manure applications were well controlled, and soil sample concentrations for nitrate have continued to decrease or be maintained. As of fall 2022, 67% (8 of 12) of the Liberty/H&S Bosma Dairy fields are in the "Low Risk" category (indicating a field with less than 15 ppm nitrate at the 2-foot depth interval) as defined in Washington's current CAFO permit. Three fields (25%) were in the "Moderate Risk" (15 to 30 ppm) category, and one field (8%) was in the "High Risk" (30 to 45 ppm) category.

5.4.3 Field Moisture Management

At Liberty/H&S Bosma Dairy, there are a total of 30 sensor locations in 13 fields. In 2022, as discussed in Section 5.2.1, malfunctioning moisture sensor stations were repaired, replaced, and upgraded. The following is a summary based on available data for the 2022 irrigation season:

- Four fields (LD-SU03, LD-SU04, LD-SU07, and LD-SU09) had no field capacity exceedances observed at the 3-foot soil depth through the entire 2022 irrigation season.
- Four fields (LD-SU02, LD-SU05, LD-SU06, and LD-SU10) had one or two field capacity exceedances observed at the 3-foot soil depth through the entire 2022 irrigation season.
- Five fields (LD-SU08 N, LD-SU08 S, LD-SU14, LD-SU16, and LD-SU17) had five or more field capacity exceedances observed at the 3-foot soil depth through the entire 2022 irrigation season.
- Total field capacity exceedances observed at the 3-foot depth per sensor occurred at a frequency of 1.1% over the entire 2022 irrigation season (Table 10).

In response to the field capacity exceedances noted, water application to these fields was adjusted by turning the water off or by lengthening the time between planned applications until moisture levels decreased below field capacity. These adjustments resolved the issue.

5.5 George DeRuyter & Son/D&A Dairies Application Fields

In 2022, pre-plant and post-harvest soil sampling was conducted by Agrimanagement at the 14 application fields associated with George DeRuyter & Son/D&A Dairies, from May 9 to May 19, 2022 (pre-plant), and from October 4 to November 8, 2022 (post-harvest). Liquid and solid manure samples were collected on April 20, 2022 (pre-plant), and September 20, 2022 (post-harvest). A summary of 2022 pre-plant and post-harvest data is provided in Table 13.

George DeRuyter & Son Dairy manure nutrient concentrations for total N, total NH4, total P, and total K from 2013 to 2021 are provided in Tables 9a, 9b, 9c, and 9d.

5.5.1 Soil Nitrate Level Summary

The number of application fields with nitrate levels exceeding 45 ppm in the second foot from 2013 to 2021 is depicted in Figure 19. Average post-harvest soil nitrate concentrations measured in the 14 application fields associated with George DeRuyter & Son/D&A Dairies decreased substantially since 2013 (Figure 22). From fall 2013 to fall 2022, nitrate concentrations have decreased by 71% in the top foot, 83% in the second foot, and 73% in the third foot. As discussed in Section 5.1, residual soil nitrogen measured in each field is an important element in the development of the agronomic rate for that field.

Only field GDS-SU04 exceeded the 45-ppm nitrate goal during the fall 2022 sampling event (Figure 16). This field is in a triticale-silage corn rotation. Spring 2022 measurements were below the 45-ppm goal but slightly exceeded the 45-ppm goal during fall 2022, measuring at 47 ppm nitrate. Agronomic adjustments were made that are expected to result in a continued downward trend in 2023.

5.5.2 Application Field Management

In 2022, in addition to agronomic rate, the following management tools and strategies were used toward achieving soil nitrate concentrations below 45 ppm at the 2-foot depth interval in application fields associated with George DeRuyter & Son/D&A Dairies:

- Improved application timing to better coincide with crop nutrient uptake
- In-season tissue and soil sampling to evaluate crop nutrient uptake progress
- Rotation changes to provide application flexibility

Overall, manure applications were well controlled, and soil sample concentrations for nitrate have continued to decrease or be maintained. All field manure applications for 2022 were within the acceptable recommendation ranges. As of fall 2022, 64% of the George DeRuyter & Son/D&A Dairies application fields regulated under the Consent Order are in the "Low Risk" category (indicating a field with less than 15 ppm nitrate at the 2-foot depth interval) as defined in Washington's current CAFO permit. Three fields (21%) were in the "Moderate Risk" (15 to 30 ppm) category, and one field each (7%) was in the "High Risk" (30 to 45 ppm) and the "Very High Risk" (45 ppm and above) category.

5.5.3 Field Moisture Management

At George DeRuyter & Son/D&A Dairies, there are a total of 35 sensor locations in 14 fields. In 2022, as discussed in Section 5.2.1, malfunctioning moisture sensor stations were repaired, replaced, and upgraded. All irrigation sensors will be repaired and fully operable by the start of the irrigation season in March 2023. The following is a summary based on available data:

- Two fields (GDS-SU06 and GDS-SU08) has no field capacity exceedances observed at the 3-foot soil depth through the entire 2022 irrigation season.
- Four fields (GDS-SU04, GDS-SU07, GDS-SU09, and GDS-SU10) had only one field capacity exceedance observed at the 3-foot soil depth through the entire 2022 irrigation season.
- One field (GDS-SU12) had three field capacity exceedances observed at the 3-foot soil depth through the entire 2022 irrigation season.
- Seven fields (GDS-SU01, GDS-SU02, GDS-SU03, GDS-SU05, GDS-SU11, GDS-SU13, and GDS-SU14) had four or more field capacity exceedances observed at the 3-foot soil depth through the entire 2022 irrigation season.
- Total field capacity exceedances observed at the 3-foot depth per sensor occurred at a frequency of 1.3% over the entire 2022 irrigation season (Table 10).

Once exceedances were noted, water application to these fields was adjusted by turning the water off or by lengthening the time between planned applications until moisture levels decreased below field capacity.

5.6 Off-Site Transfers

In 2022, the Dairies generated and exported liquid and solid manures and composted solids consistent with requirements outlined in the Ecology CAFO General Permit. These details are described in Appendices F, G, and H. Exported manures during 2022 included the following:

- Cow Palace: Exports included 4,233,918 gallons of liquid manure and 33,600 tons of solid manure (including compost).
- Liberty/H&S Bosma Dairies: Exports included 1,000,000 gallons of liquid manure and 33,000 tons of solid manure (including compost).
- George DeRuyter & Son/D&A Dairies: Exports included 12,774,100 gallons of liquid manure and 44,378 tons of solid manure (including compost).

6 Other Reports, Plans, and Actions

6.1 Annual Reports

In 2022, the Dairies submitted the following documents related to annual reporting:

- *2020 Annual Report* (Anchor QEA 2022u) – Submitted February 11, 2022 (EPA Letter 274)
- *2021 Annual Report* (Anchor QEA 2022v) – Submitted March 4, 2022

In 2022, no documents related to annual reporting were approved by EPA.

6.2 Quality Assurance Project Plans

Per Section III.A of the SOW, the Dairies must submit to EPA a QAPP prior to commencing any monitoring, sampling, field measurements, or laboratory sample analyses.

Each QAPP is prepared in accordance with *Guidance for QAPPs* (EPA 2001) and *EPA Requirements for QAPPs* (EPA 2002), as well as applicable amendments. The project data quality objectives are developed for use in the QAPP in accordance with *Guidance on Systematic Planning Using the Data Quality Objectives Process* (EPA 2006).

In 2022, there were no updates to project QAPPs. The 2022 groundwater monitoring events, which were outside of the Consent Order requirements, were conducted with several deviations from the associated QAPP (Anchor QEA 2018c) as described in Section 4.1.

6.3 Health and Safety Plan

Per Section III.B of the SOW, the Dairies must submit to EPA a health and safety plan (HASP) at least 14 days in advance of initial field work for each task.

Each HASP is compliant with the Occupational Safety and Health Act and its implementing regulations. The HASP will be updated periodically, as applicable, to address changes in work or field activities. The current HASP (Anchor QEA 2016) was submitted to EPA on September 13, 2016.

In 2022, there were no loss time injuries or recordable incidents.

6.4 Public Involvement

Per Section III.C of the SOW, the Dairies must notify EPA of their interest in participating in the public involvement process within 30 days of the effective date of the Consent Order. On April 18, 2013, the Dairies notified EPA of their interest in participating in the public involvement process.

In 2022, no public involvement activities were performed.

7 References

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8 Certifications

Cow Palace Dairy Certification

I certify under the penalty of law that this document and attachments were prepared by me or under my direction or supervision in accordance with a system designed to assure that qualified personnel gathered and evaluated the information submitted. Based on my inquiry of any and persons directly responsible for gathering and analyzing the information obtained, I certify that the information contained in or accompanying this submittal is to the best of my knowledge and belief, true, accurate, and complete. As to those identified portion(s) of this submittal for which I cannot personally verify the accuracy, I certify that this submittal and attachments were prepared in accordance with procedures designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those directly responsible for gathering the information, or the immediate supervisor of such person(s), the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Cow Palace, LLC

Signature	Adam Dolsen
Name	Adam Dolsen
Title	Member
Date	2-27-23

George DeRuyter & Son Dairy, D&A Dairy, and George & Margaret Certification

I certify under the penalty of law that this document and attachments were prepared by me or under my direction or supervision in accordance with a system designed to assure that qualified personnel gathered and evaluated the information submitted. Based on my inquiry of any and persons directly responsible for gathering and analyzing the information obtained, I certify that the information contained in or accompanying this submittal is to the best of my knowledge and belief, true, accurate, and complete. As to those identified portion(s) of this submittal for which I cannot personally verify the accuracy, I certify that this submittal and attachments were prepared in accordance with procedures designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those directly responsible for gathering the information, or the immediate supervisor of such person(s), the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

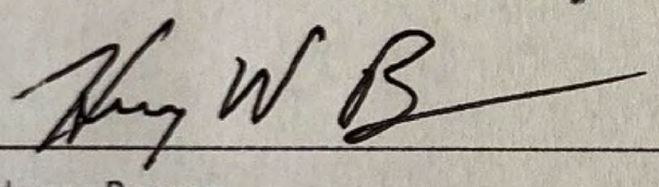
George DeRuyter & Son Dairy, LLC, D&A Dairy, LLC (also known as D and A Dairy, L.L.C.), and George & Margaret, LLC

Signature	Dan DeRuyter
Name	Dan DeRuyter
Title	Member
Date	3/2/23

Liberty Dairy Certification

I certify under the penalty of law that this document and attachments were prepared by me or under my direction or supervision in accordance with a system designed to assure that qualified personnel gathered and evaluated the information submitted. Based on my inquiry of any and persons directly responsible for gathering and analyzing the information obtained, I certify that the information contained in or accompanying this submittal is to the best of my knowledge and belief, true, accurate, and complete. As to those identified portion(s) of this submittal for which I cannot personally verify the accuracy, I certify that this submittal and attachments were prepared in accordance with procedures designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those directly responsible for gathering the information, or the immediate supervisor of such person(s), the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Liberty Dairy, LLC (and its associated dairy facility H&S Bosma Dairy)

Signature 

Name Henry Bosma

Title Partner

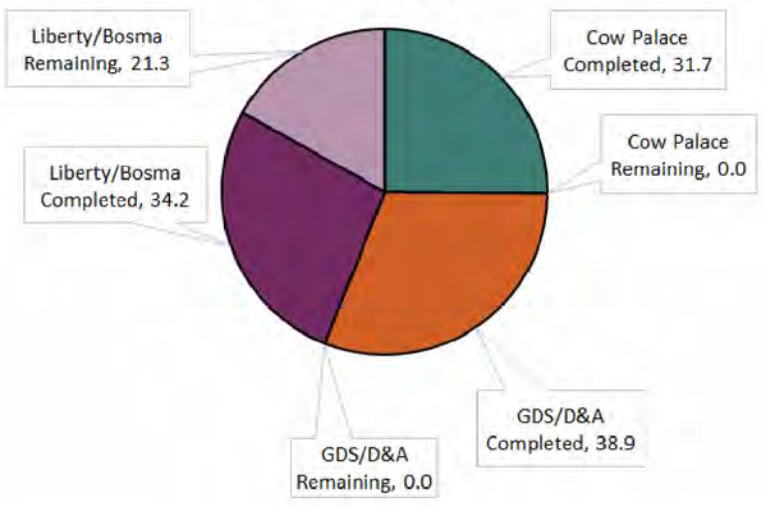
Date 2-28-2023

	Liberty/Bosma Dairy																							
										Consolidated[a]			Consolidated[a]			Consolidated[a]							
Lagoon ID	1	2	3	4a	4b	5	6	8	9	10	(11)	(13)	12	(7)	14	15	(16)	(17)	18	19	20	RWP	VTS	Total
Initial Capacity (M gal)	14.4	2.6	4.3	12.6			2.45	0.6	0.3	2.0			4.5		5.3	2.6			1.9	0.4	0.3	1.2	na	55.5
Revised Capacity (M gal)	14.4	2.6	4.3	13.1			2.72	na	na	2.6			4		6.7	2.7			1.9	na	na	1.2		56.1
2016																								
2017																								
2018																								
2019																								
2020																								
2021																								
2022																								

	George DeRuyter Dairy								D&A Dairy					
									Consolidated[a]		Consolidated[a]			
Lagoon ID	1	2	3	4	SWC B	DIG	DAF	NDN	1	2	3	(4)	TUP	Total
Initial Capacity (M gal)	4.3	10.7	5.8	4.5	0.73	n/a	n/a	n/a	8.8		2.4		1.7	38.9
Revised Capacity (M gal)	4.3	8.4	5.8	2.1	4.42	n/a	n/a	n/a	9.7		2.58		n/a	37.3
2016														
2017														
2018														
2019														
2020														
2021														
2022														

	Cow Palace Dairy									
		Consolidated[a]			Consolidated[a]					
Lagoon ID	1	2	(3)	4	SBA	SBB	CNW	CNE	SDB	Total
Initial Capacity (M gal)	10.6	8.99		3.7	3.5		2.79	1.1	1.0	31.7
Revised Capacity (M gal)	13.8	24.3		3.7	3.5		2.79	na	0.7	48.8
2016										
2017				●						
2018										
2019										
2020										

Progress of Lagoon Lining and Abandonment by Initial Capacity (M gal)



Notes:

Designed
Scheduled work in progress
Lagoon Lined
Abandonment completed
Treatment system construction
Abandonment in progress

CNW: Catch Basin NW
CNE: Catch Basin NE
DIG: Digester
DAF: Dissolved Air Flotation Unit
NDN: Nitrification/Denitrification System
RWP: Red Water Pond
SBA: Settling Basin A
SBB: Settling Basin B
SDB: Safety Debris Basin
SWCB: Stormwater Catch Basin
TUP: Take Up Pond
VTS: Vermiculture Treatment System
● Lagoon assessed, meets applicable NRCS standards

a. Lagoon IDs show in parentheses are part of consolidated lagoons; black Lagoon IDs are the current lagoon ID number.

1. Lagoon volumes are listed based on operational volumes (with min 2 feet of freeboard). Volumes are based on survey data where available. Where survey data are not available, volumes are based on the volumes listed in the Lagoon Work Plans.

2. Completed volumes shown do not include lagoons taken out of service, emptied, and cleaned in 2021 and 2022 for abandonment since the abandonment work was not fully completed.

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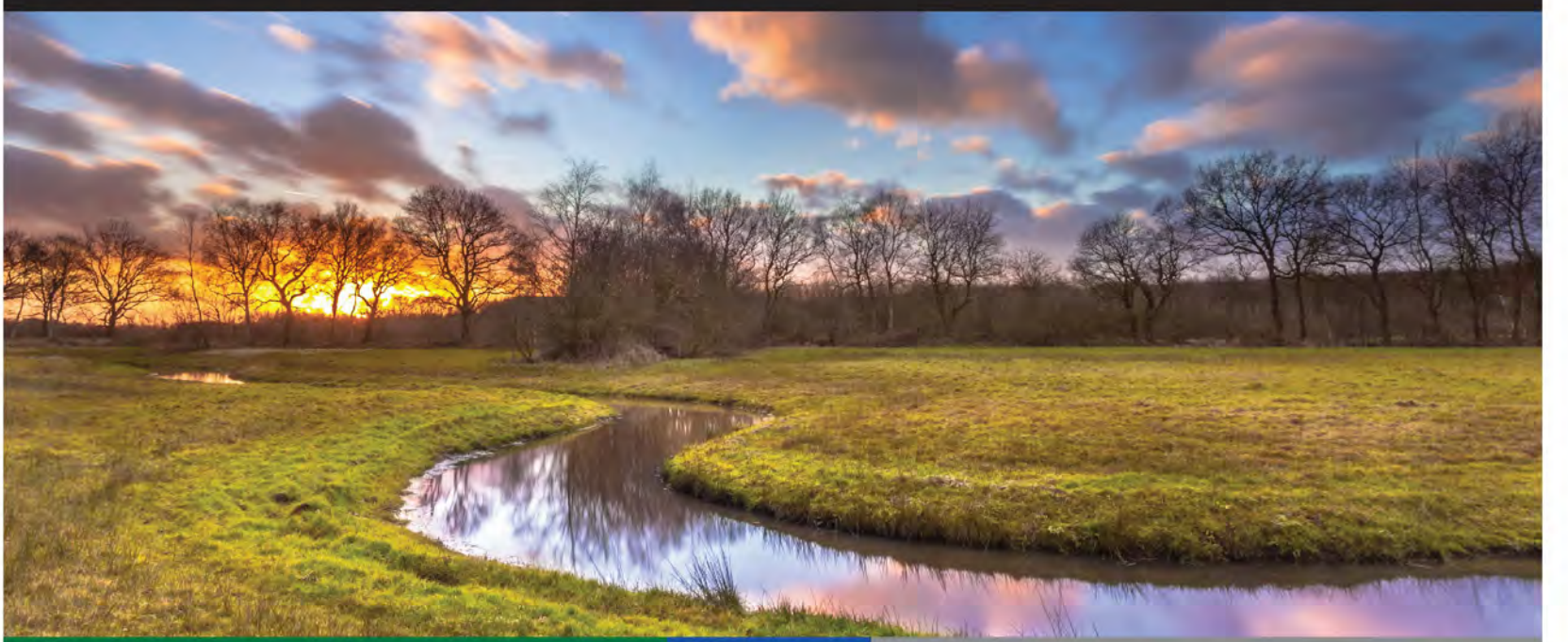
ANCHOR QEA

Figure 3
Progress of Lagoon Lining and Abandonments
2022 Annual Report
Yakima Valley Dairies

Eric Winiecki Declaration
Exhibit P

Water & Environmental TECHNOLOGIES

Cow Palace Dairy Facility Installation Quality Assurance and Quality Control Manual



Granger, Washington

April 18, 2018

Facilities Covered: Lagoon 1

EPA Region 10

AOC Docket No.

SDWA-10-2013-0080

Prepared for:
Cow Palace Dairy, Inc.
1631 N. Liberty Road
Granger, WA 98932

Prepared by:
Water & Environmental Technologies
480 East Park Street
Butte, MT 59701
406.782.5220

Table of Contents

List of Appendices ii
List of Acronyms ii
ABSTRACT iii
1.0 INTRODUCTION 1
1.1 PURPOSE 1
1.2 SCOPE 1
1.3 LINER MATERIALS 1
1.4 SUBMITTALS 1
2.0 GEOMEMBRANE INSTALLATION QA MANUAL 1
2.1 STANDARD TEST METHODS 1
2.2 MATERIAL DELIVERY 1
2.3 EARTHWORK 1
2.4 PANEL PLACEMENT 1
2.5 TRIAL WELDS 1
2.6 GEOMEMBRANE FIELD SEAMING 2
2.7 DESTRUCTIVE SEAM TESTING 2
2.8 NON-DESTRUCTIVE SEAM TESTING 2
2.9 DEFECTS & REPAIRS 2
2.10 REPAIR PROCEDURES 2
2.11 AS-BUILT/RECORD DRAWINGS 2
2.12 ATTACHMENTS/APPENDICES 3
3.0 GEOCOMPOSITE INSTALLATION QA MANUAL 3
3.1 PACKAGING 3
3.2 MATERIAL DELIVERY 3
3.3 UNLOADING & STORAGE PROCEDURES 3
3.4 DEPLOYMENT 3
3.5 OVERLAPS & SEAMS 4
3.6 ATTACHMENTS/APPENDICES 4
4.0 GEOTEXTILE INSTALALTION QA MANUAL 4
4.1 MATERIAL DELIVERY PROCEDURES 4

4.2 MATERIAL UNLOADING PROCEDURES 4
4.3 MATERIAL HANDLING & STORAGE PROCEDURES 4
4.4 INSTALLATION PROCEDURES 5
4.5 SEAMING QUALITY & METHOD 5

List of Appendices

Appendix A Geomembrane Installation Specification
Appendix B Manufacturing Quality Control Manual
Appendix C Installer Construction Quality Control Manual

List of Acronyms

ASTM	American Society of Testing and Materials
EPA	Environmental Protection Agency (US)
GSI	Geosynthetic Institute
HDPE	High Density Polyethylene
QA	Quality Assurance
WET	Water & Environmental Technologies

ABSTRACT

The purpose of this Project Quality Assurance and Quality Control Manual is to provide guidance to the Manufacturer, Contractor, and Installer to ensure all materials and work to be conducted are supplied and executed according to accepted industry construction specifications, testing, and standards. Industry-accepted manufacturing and construction practices must be implemented to ensure that the lagoon system is easy to operate, long lasting, and is constructed without any leaks or operational issues.

1.0 INTRODUCTION

This Installation Quality Assurance Manual for the Lagoon 1 liner project was prepared by Water & Environmental Technologies (WET) on behalf of Cow Palace, LLC (Cow Palace) as required by the US Environmental Protection Agency (EPA) Region 10.

1.1 PURPOSE

The purpose of this document is to outline the requirements of all manufacturer-supplied installation QA manuals used during construction to ensure that the liners are installed in accordance with the project specifications and manufacturer recommendations. The QA manuals supplied by the manufacturer will describe in detail the testing and installation procedures required to meet the objective of a zero-leak facility.

1.2 SCOPE

The Contractor will submit to the Engineer all manufacturer QA installation procedures and manuals prior to project execution in accordance with the project specifications. The QA manuals must be approved by the Engineer prior to project execution.

1.3 LINER MATERIALS

The following liner materials will be used for the Lagoon 1 liner project:

- **Primary Liner**
  The primary liner will consist of a textured HDPE geomembrane. The liner must meet the requirements outlined in the Project Drawings and Project Specifications.

- **Secondary Liner and Collection/Detection System**
  The secondary liner will consist of an HDPE geomembrane featuring 0.13 inch-tall HDPE studs meeting the requirements outlined in the Project Drawings and Project Specifications. The studs provide space between the secondary liner and primary liner that serves as the leak collection pathway.

1.4 SUBMITTALS

The Contractor will submit to the Engineer the following:

- Manufacturer - Supplied Geomembrane Installation QA Manual
- Manufacturer - Supplied Geocomposite Installation QA Manual
- Manufacturer - Supplied Geotextile Installation QA Manual

Once submittals are received and made a part of this document, the Installation Quality Assurance Manual will be submitted to EPA for review.

2.0 GEOMEMBRANE INSTALLATION QA MANUAL

The Geomembrane Installation QA Manual will provide quality assurance procedures consistent with industry accepted practices to ensure that the geomembrane products installed will perform for its intended purpose. All installation work will be performed in accordance with the QA Installation Manual and project specifications.

2.1 STANDARD TEST METHODS

Standard test methods will be referenced. These test methods include but are not limited to ASTM standards and GSI standards.

2.2 MATERIAL DELIVERY

Material delivery procedures will be described including, but not limited to:

- Keeping an inventory of all materials delivered
- Logging of roll numbers on inventory checklist
- Cross-referencing with the Bill of Lading supplied by the manufacturer
- Noting any visible damage to materials and record on inventory checklist

2.3 EARTHWORK

Earthwork requirements will be described including:

- Responsible party for preparing and maintaining subgrade
- Responsible party for assuring subgrade is properly prepared prior-to deployment of liner material

2.4 PANEL PLACEMENT

Panel placement procedure including:

- Assignment of numbering designation to each panel
- Panel numbers marked in the center of each deployed panel with pertinent information
- Procedures for panel deployment

2.5 TRIAL WELDS

Procedures for conducting trial welds will be described in detail including at a minimum.

- Frequency of tests
- Sampling procedures
- Trial weld testing
- Pass/Fail Criteria

2.6 GEOMEMBRANE FIELD SEAMING

Field seaming procedures of the geomembrane will be described in detail including at a minimum:

- Numbering of the seam
- Recording of the welding technician's initials, machine number, date and time at the start of every seam and on the seam log.
- Field seaming process (fusion or extrusion welding)
- Verification by welding technician that all seams are prepared and executed in conformance with the manufacturer's specifications.

2.7 DESTRUCTIVE SEAM TESTING

Procedures for destructive seam testing will be described in detail including at a minimum:

- Frequency of testing
- Location of tests
- Labeling of samples
- Logging of sample test data
- Pass/Fail requirements

2.8 NON-DESTRUCTIVE SEAM TESTING

Procedures for non-destructive seam testing will be conducted using spark testing and will be described in detail. If ASTM procedure is used, reference the ASTM procedure used.

2.9 DEFECTS & REPAIRS

Procedures for identifying defects and prescribing subsequent repairs will be described in detail including at a minimum:

- Identification of defect type (liner hole, liner depression, etc.)
- Documentation of procedure to be used for repair defect

2.10 REPAIR PROCEDURES

Procedures for repairing defects will be described in detail.

2.11 AS-BUILT/RECORD DRAWINGS

The QA Installation Manual will mandate that the installer provides as-built drawings documenting at a minimum:

- Panel numbers and roll numbers corresponding to the panel placement log
- All destructive testing and repair locations

2.12 ATTACHMENTS/APPENDICES

The QA Manual will provide sample forms as attachments or appendices that include the following at a minimum:

- Inventory Check List Log
- Subgrade Surface Acceptance Log
- Panel Placement Log
- Trail Weld Log
- Seam Log
- Destructive Test Log
- Non-Destructive Log – Liner Integrity Survey Log (For Spark Testing)

3.0 GEOCOMPOSITE INSTALLATION QA MANUAL

The Geocomposite Installation QA Manual will provide quality assurance procedures consistent with industry accepted practices to ensure that the geocomposite products installed will perform for its intended purpose. All installation work will be performed in accordance with the QA Installation Manual and project specifications.

3.1 PACKAGING

The QA Installation Manual will describe the packaging requirements from the manufacturer in detail.

3.2 MATERIAL DELIVERY

Material delivery procedures will be described including at a minimum:

- Keeping an inventory of all materials delivered
- Logging of roll numbers on inventory checklist
- Cross-referencing with the Bill of Lading supplied by the manufacturer
- Noting any visible damage to materials and record on inventory checklist

3.3 UNLOADING & STORAGE PROCEDURES

Unloading and storage procedures will be described including at a minimum:

- Unloading equipment requirements
- Storage requirements
- Storage surface requirements

3.4 DEPLOYMENT

Deployment procedures for handling and installing the geocomposite will be described in detail including at a minimum:

- Procedure for deployment on slopes
- Temporary ballasting against wind

3.5 OVERLAPS & SEAMS

Procedures for overlaps & seams will be described in detail including at a minimum:

- Overlap in the machine and transverse direction
- Cable tie spacing requirements
- Method of seaming top and bottom geotextile of the geocomposite

3.6 ATTACHMENTS/APPENDICES

The QA Manual will provide sample forms as attachments or appendices that include the following at a minimum:

- Inventory Checklist Form
- Certificate of Acceptance Form

4.0 GEOTEXTILE INSTALLATION QA MANUAL

The Geotextile Installation QA Manual will provide quality assurance procedures consistent with industry accepted practices to ensure that the geocomposite products installed will perform for its intended purpose. All installation work will be performed in accordance with the QA Installation Manual and project specifications.

4.1 MATERIAL DELIVERY PROCEDURES

The QA Installation Manual will describe the material delivery procedures from the manufacturer in detail.

4.2 MATERIAL UNLOADING PROCEDURES

Unloading procedures will be described in detail, including at a minimum:

- Unloading equipment requirements
- Material unloading procedures

4.3 MATERIAL HANDLING & STORAGE PROCEDURES

Handling and storage procedures will be described in detail for the material, including at a minimum:

- Handling procedures
- Direct contact with heavy equipment
- Storage requirements

4.4 INSTALLATION PROCEDURES

Complete installation procedures for the material will be detailed.

4.5 SEAMING QUALITY & METHOD

The seaming quality and methods for the geotextile will be detailed.

Appendix A

Geomembrane Installation Specification

"Partner in Quality"

HDPE AND LLDPE GEOMEMBRANE INSTALLATION SPECIFICATION

The information provided in this manual uses current quality control and quality assurance standards within the geomembrane industry. It is the sole responsibility of the user to determine the suitability and use of the information and/or discusses material (s). Agru America, Inc. is not an installer of Geosynthetics Membranes. This manual is provided only as a guideline and is not meant as an authority. Agru America will not be held liable for the installation of Geosynthetic Membranes by others.

1.1

INDEX

1. GENERAL

1.1. Summary
1.2. References
1.3. Submittals
1.4. Quality Control
1.5. Delivery, Storage and Handling
1.6. Project Conditions
1.7. Material Warranty
1.8. Geomembrane Installation Warranty
1.9. Geomembrane Pre-Construction Meeting

2. PRODUCTS

2.1 Source Quality Control
2.2 Geomembrane

3. EXECUTION

3.1 Sub Grade Preparation
3.2 Geomembrane Deployment
3.3 Seaming Procedures
3.4 Pipe Penetration and Structure Sealing
3.5 Field Quality Control
3.6 Liner Acceptance
3.7 Anchor Trench
3.8 Scrap Materials

4. MEASUREMENT and PAYMENT

4.1 Per Contractual Agreement

5. GEOTEXTILES, GEONETS and GEOCOMPOSITES

5.1 Geotextile
5.2 Geonet
5.3 Geocomposite
5.4 Repair Procedures

6. SEAM STRENGTH PERFORMANCE SPECIFICATIONS

6.1Tables

1. GENERAL

1.1 Summary

This specification includes furnishing and installing HDPE and LLDPE geomembranes. The HDPE formulated sheet density includes 0.940 g/cc or greater. The LLDPE formulated sheet density includes 0.939 or less. Geomembranes with both smooth and textured surfaces are included.

1.2 References

1.2.1. American Society for Testing and Materials (ASTM):

1.2.1.1. ASTM Standard D4437, 1988 (1999), "Standard Practice for Determining the Integrity of Field Seams Used in Joining Flexible Polymeric Sheet Geomembranes", ASTM International, West Conshohocken, PA, 1999, DOI: 10.1520/D4437-99, www.astm.org.

1.2.1.2. ASTM Standard D 5199, 2001 (2006), "Standard Test Method for Measuring the Nominal Thickness of Geosynthetics", ASTM International, West Conshohocken, PA, 2001, DOI: 10.1520/D5199-01R06, www.astm.org.

1.2.1.3. ASTM Standard D 5641, 1994 (2006), "Standard Practice for Geomembrane Seam Evaluation by Vacuum Chamber", ASTM International, West Conshohocken, PA, 1994, DOI: 10.520/D5641-94R06, www.astm.org.

1.2.1.4. ASTM Standard D 5820, 1995 (2006), "Standard Practice for Pressurized Air Channel Evaluation of Dual Seamed Geomembranes", ASTM International, West Conshohocken, PA, 1995, DOI: 10.1520/D5820-95R06, www.astm.org.

1.2.1.5. ASTM Standard D 5994, 1994 (2003), "Standard Test Method for Measuring Core Thickness of Textured Geomembrane", ASTM International, West Conshohocken, PA, 1994, DOI: 10.1520/D5994-98R03, www.astm.org.

1.2.1.6. ASTM Standard D 6365, 1999 (2006), "Standard Practice for the Nondestructive Testing of Geomembrane Seams using the Spark Test", ASTM International, West Conshohocken, PA, 1999, DOI: 10.1520/D6365-99R06, www.astm.org.

1.2.1.7. D5820-95, Pressurized Air Channel Test for Dual Seamed Geomembranes

1.2.2. Geosynthetic Research Institute (GRI):

1.2.2.1. GRI GM 9, 1995, "Cold Weather Seaming of Geomembranes", Geosynthetic Institute, Folsom, PA, www.geosynthetic-institute.org

1.2.2.2. GRI GM 10, 1997 (2006), "The Stress Crack Resistance of HDPE Geomembrane Sheet", Geosynthetic Institute, Folsom, PA, www.geosynthetic-institute.org

1.2.2.3. GRI GM 13, 1997 (2009), "Test Properties, Testing Frequency for High Density Polyethylene (HDPE) Smooth and Textured Geomembranes", Geosynthetic Institute, Folsom, PA, www.geosynthetic-institute.org

1.2.2.4. GRI GM 14, 1998, "Selecting Variable Intervals for Taking Geomembrane Destructive Seam Samples Using the Method of Attributes" Geosynthetic Institute, Folsom, PA, www.geosynthetic-institute.org

1.2.2.5. GRI GM 17, 2000 (2009), "Test Methods, Test Properties and Testing Frequency for Linear Low Density Polyethylene (LLDPE) Smooth and Textured Geomembranes", Geosynthetic Institute, Folsom, PA, www.geosynthetic-institute.org

1.2.2.6. GRI GM 19, 2002 (2010), "Seam Strength and Related Properties of Thermally Bonded Polyolefin Geomembranes", Geosynthetic Institute, Folsom, PA, www.geosynthetic-institute.org

1.3 Submittals

1.3.1. Submit the following to the Project Engineer or Property Owner, for review and approval, within a reasonable time, to expedite shipment and/or installation of the Geomembrane:

1.3.1.1. Documentation of Manufacturer's Qualifications (as specified in subsection 1.04A);

1.3.1.2. Manufacturer's Quality Control Program Manual (or descriptive documentation);

1.3.1.3 Material Properties Sheet, (including at a minimum all properties specified in GRI GM 13 and test methods used);

1.3.1.4. Material Sample;

1.3.1.5. Documentation of Installer's qualifications, (as specified below);

1.3.1.5.1. Submit a list of at least ten facilities completed by installer. (For each installation, provide the name and type of facility, facility location, date of installation, name and telephone number of facility contact, type and thickness of geomembrane used and, surface area of the installed geomembrane.)

1.3.1.5.2. Submit resumes or qualifications of the Installation Supervisor, Master Seamer and Technicians assigned to this project.

1.3.1.5.3 Installer's Quality Control Program

1.3.1.6. Material and Liner Installation Warranties;

1.3.1.6.1. Submit a copy of all material warranties.

1.3.1.6.2. Submit a copy of all liner installation warranties.

1.3.2. Shop Drawings

1.3.2.1. Submit copies of shop drawings for engineer's approval within a reasonable time. Shop drawings shall show the proposed panel layout identifying seams and details. Seams should generally follow the direction of the slope. Butt seams or roll-end seams should not occur on a slope unless approved by the Owner's Representative. However, if allowed, these seams should be staggered.

1.3.2.2. Placement of geomembrane should not occur until Owner's Representative has received and approved the shop drawings.

1.3.3. Additional Submittals (To be provided during and after installation is complete.)

1.3.3.1 Manufacturer's warranty (refer to subsection 1.07).

1.3.3.2. Geomembrane installation warranty (refer to subsection 1.08).

1.3.3.3. Daily written acceptance of sub-grade surface (refer to subsection 3.01.C).

1.3.3.4. Low-temperature seaming procedures if applicable (refer to subsection 3.03.A).

1.3.3.5. Prequalification test seam samples (refer to subsection 3.05.A.6).

1.3.3.6. Field seam non-destructive test results (refer to subsection 3.05.B.1).

1.3.3.7. Field seam destructive test results (refer to subsection 3.05.C.6).

1.3.3.8. Daily field installation reports (refer to subsection 3.05.G).

1.3.3.9. Installation record drawing (refer to subsection 3.05).

1.4 Quality Control

1.4.1. Manufacturer's Qualifications: The manufacturer shall have at least five (5) years experience in the manufacturing of the specified or similar geomembrane product and shall have manufactured at least 1,000,000 M^2 (10,000,000 FT^2) of the specified type of geomembrane or a similar product during the last five years.

1.4.2. Installer's Qualifications

1.4.2.1. The Geomembrane Installer shall be an approved installer by the Manufacturer.

1.4.2.2. The Geomembrane Installer shall have at least three (3) years experience installing the specified or similar geomembrane and shall provide a list outlining at least ten (10) projects totaling 500,000 M^2 (5,000,000FT^2) of the specified type of geomembrane or similar completed within the past three (3) years.

1.4.2.3. A Field Installation Supervisor performs and assumes responsibility throughout the geomembrane installation including geomembrane panel

layout, seaming, patching, testing, repairs, and all other outlined responsibilities. The Field Installation Supervisor shall have experience in or supervision in the installation and seaming of at least ten (10) projects totally 500,000 M^2 (5,000,000 FT^2) of geomembrane or the type specified or similar product.

1.4.2.4. Seaming shall be performed under the direction of a Master Seamer (who may also be the Field Installation Supervisor or Crew Foreman) with seaming experience of a minimum of 300,000M^2 (3,000,000FT^2) of the geomembrane type specified or similar product, using the same type of seaming apparatus to be used in the current project. During the seaming, the Field Installation Supervisor and/or Master Seamer are present.

1.4.2.5. Qualified technicians employed by the Geomembrane installer complete all seaming, patching, testing, and other welding operations.

1.5 Delivery, Storage and Handling

1.5.1. Manufacturer labels must be on all rolls delivered to the project.

1.5.2. A firmly affixed label attached to the selvage edge, shall clearly state the manufacturer's name, product identification, material thickness, roll number, roll type, roll dimensions and roll weight.

1.5.3. The Manufacturer protects the Geomembrane from mud, dirt, dust, puncture, cutting or any other damaging or deleterious conditions.

1.5.4. Continuously and uniformly supported, rolls are stored away from high traffic areas on a smooth, level surface. Chocks keep the rolls secure when necessary.

1.6 Project Conditions

Do not install Geomembrane in the presence of standing water, while precipitation is occurring, during excessive winds, or when material temperatures are outside the limits specified in Section 3.3.2.1 and 3.3.3.

1.7 Material Warranty

Material manufacturer shall guarantee material against defects and premature aging from environmental conditions on a pro rata basis for a specified period of time acceptable to owner and manufacturer.

1.8 Geomembrane Installation Warranty

The Geomembrane Installer shall guarantee the geomembrane installation against defects in the installation and workmanship for a time period satisfactory to all parties commencing with the date of final acceptance.

1.9 Geomembrane Pre-Construction Meeting

1.9.1. A Pre-Construction Meeting held at the site prior to installation of the geomembrane will include the Geomembrane Installer, Owner, Owner's representative (Engineer and/or CQA Firm), and the Earthwork Contractor.

1.9.2. Topics for this meeting shall include:

1.9.2.1. Health and Safety

1.9.2.2. Lines of authority and communication, resolution of any project document ambiguity.

1.9.2.3. Methods for documenting, reporting and distributing documents and reports

1.9.2.4. Procedures for packaging and storing archive samples.

1.9.2.5. Review of time schedule for all installation and testing.

1.9.2.6. Review of panel layout and numbering systems for panels and seams including details for marking on geomembrane

1.9.2.7. Procedures and responsibilities for preparation and submission of as-built panel and seam drawings

1.9.2.8. Temperature and weather limitations, installation procedures for adverse weather conditions, defining acceptable sub grade, geomembrane, or ambient moisture and temperature conditions for working during liner installation

1.9.2.9. Sub grade conditions, dewatering responsibilities and sub grade maintenance plan

1.9.2.10. Deployment techniques including allowable sub grade for the geomembrane

1.9.2.11. Plan for controlling expansion/contraction and wrinkling of the geomembrane

1.9.2.12. Covering of the geomembrane and cover soil placement

1.9.2.13. Measurement and payment schedules

1.9.2.14. Responsibilities of each party

1.9.3. A designated person will document the meeting and send a copy of the minutes to each person in attendance.

2. PRODUCTS

2.1. Source Quality Control

2.1.1. Manufacturing Quality Control

2.1.1.1. The test methods and frequencies used by the manufacturer for quality control/quality assurance of the above geomembrane prior to delivery, shall be in accordance with the latest revision of the GRI GM 13 for HDPE geomembrane or GRI GM 17 for LLDPE geomembrane, or modified as required for project specific conditions.

2.1.1.2. The manufacturer's geomembrane quality control certifications, including results of quality control testing of the products, as specified in subsection 2.01.A.3, must be supplied to the Owner's Representative to verify that the materials supplied for the project are in compliance with all product and or project specifications. The certification, signed by a responsible party employed by the manufacturer, such as the QA/QC Manager, Production Manager, or Technical Services Manager, includes lot and roll numbers and corresponding shipping information.

2.1.1.3. The Manufacturer provides production/manufacturing Certification that the geomembrane and welding rod supplied for the project are from the same material type and are compatible.

2.2. Geomembrane

2.2.1. The geomembrane shall consist of new, first quality products designed and manufactured specifically for the purpose of this work. The product will satisfactorily complete testing demonstrating its suitability and durability for the purposes intended. The geomembrane rolls shall be seamless, high density polyethylene (HDPE - Formulated Sheet Density ≥ 0.94g/cc) or linear low density polyethylene (LLDPE - Formulated Sheet Density ≤ 0.939 g/cc) containing no plasticizers, fillers or extenders and shall be free of holes, blisters or contaminants, and leak free verified by 100% in line spark or equivalent testing. The geomembrane supplied is a continuous sheet with no factory seams in rolls.

The geomembrane will meet the property requirements as shown in (GRI GM 13for HDPE) or (GRI GM 17 for LLDPE). To down load current GRI GM specifications go to the Geosynthetic Research Institute: http://www.geosynthetic-institute.org/specifications.htm

2.2.2. Material conformance testing by the Owner's Representative, if required, will be conducted using in-plant sampling or as specified for the project.

2.2.3. The geomembrane seams shall meet the property requirements as shown in **Section 5** or as required by project specifications

3. EXECUTION

3.1 Sub-grade Preparation

3.1.1. The sub grade shall be prepared in accordance with the project specifications. The geomembrane sub grade shall be uniform and free of sharp or angular objects that may damage the geomembrane prior to installation of the geomembrane.

3.1.2. The Geomembrane Installer and Owner's Representative shall inspect the surface before covering with the geomembrane on each day's operations to verify suitability.

3.1.3. The Geomembrane Installer and Owner's Representative shall provide daily a written acceptance of the surface before covering with the geomembrane. During installation, the Installer and Owner's Representative must ensure daily surface maintenance ensuring sub-grade suitability.

3.1.4. Prior to placement of the geomembrane, the Installer and Owner's Representative must repair all sub grade damaged by construction equipment and deemed unsuitable for geomembrane deployment. The Installer and Owner's Representative provides approval for all repairs. All damage and repair protocol including contractor and Installer responsibilities, are outlined in the preconstruction meeting.

3.2 Geomembrane Placement

3.2.1. The Owner's Representative approves all applicable certifications and quality control certificates listed in subsection 1.03 within the timeframe specified in the Contract Documents. If the material does not meet project specifications, the Contractor removes it from the work area.

3.2.2. The geomembrane installation must follow the limits shown on the project drawings and essentially as shown on approved Panel Placement Drawings. Submit any changes made to Panel Placement Drawings before deployment of liner materials. The Installer must receive approval for the changes prior to deployment of liner materials.

3.2.3. When temperatures are lower than 0 degrees C (32 degrees F), unless approved by the Owner's Representative, no geomembrane material can be unrolled and/or deployed. The Owner's Representative may adjust the minimum temperature for material deployment. The Installer and Owner's Representative defines temperature limitations during the preconstruction meeting. Only deploy the quantity of geomembrane anchored and seamed together in one day.

3.2.4. No vehicular traffic shall travel on the geomembrane other than an approved low ground pressure vehicle or equivalent. The Owner's Representative shall It is suggested that a test pad simulating the methods to be used and showing no damage to the liner will result, be performed prior to implementation of the proposed method.

3.2.5. Use sand bags or equivalent ballast as necessary temporarily holding the geomembrane material in position under the foreseeable and reasonably - expected wind conditions. Sand bag material shall be sufficiently close- knit to prevent fines from working through the bags and discharging on the geomembrane.

3.2.6. Installer and Owner's representative should not place geomembrane if moisture prevents proper sub grade preparation, panel placement, or panel seaming. Defined in the preconstruction meeting, the moisture limitations provide direction for the Installer and Owner's representative.

3.2.7. Damaged and rejected panels (or portions) shall be marked, removed from the work area, and the removal recorded/documented.

3.2.8. The geomembrane should not "bridge over" voids or low areas in the sub grade. The geomembrane shall rest in intimate contact with the sub grade.

3.2.9. Wrinkles caused by panel placement or thermal expansion should be minimized in accordance with section 1.09 paragraph B11.

3.2.10. Considerations on Site Geometry: In general, seams shall be oriented parallel to the line of the maximum slope. In corners and odd shaped geometric locations, minimization of the total length of field seams is required. Seams shall not be located at low points in the sub-grade unless geometry requires seaming at such locations and if approved by the Owner's Representative.

3.2.11. All panels must overlap prior to the seaming process. This overlap affects a weld and allows for proper testing. In no case shall this overlap be less than 75mm (3 in.).

3.2.12. Sharp stones or other hard objects that could potentially damage the membrane should not be within 1" (25mm) of the surface to be lined.

3.2.13. Sub-grade should be firm, unyielding and able to support deployment equipment without damage or rutting to the sub-grade.

3.3 Seaming Procedures

3.3.1. Cold weather installations should follow guidelines as outlined in GRI GM9.

3.3.2. The seaming process shall not occur when liner temperatures are less than 0 degrees C (32 degrees F) unless the Installer and/or Owner's Representative complies with the following conditions.

3.3.2.1. The seaming of the geomembrane at material temperatures below 0 degrees C (32 degrees F) only transpires when the Geomembrane Installer can demonstrate the following to the Owner's Representative using pre-qualification test seams.

3.3.2.1.1. Field seams comply with the project specifications.

3.3.2.1.2. The safety of the crew ensured.

3.3.2.1.3. Geomembrane material can be fabricated (i.e. pipe boots, penetrations, repairs. etc.) at sub-freezing temperatures.

3.3.2.2. The Geomembrane Installer shall submit to the Owner's Representative for approval, detailed procedures for seaming at low temperatures, possibly including the following:

3.3.2.2.1. Preheating of the geomembrane,

3.3.2.2.2. Using a tent or other device preventing heat loss during seaming and rapid heat loss subsequent to seaming,

3.3.2.2.3. Completion of a Number of test welds to determine appropriate seaming parameters.

3.3.3. If the geomembrane sheet temperature is above 75 degrees C (170 degrees F) as measured by an infrared thermometer or surface thermocouple, seaming transpires only with the approval by the Owner's Representative. This approval depends upon the recommendations by the manufacturer and on a field demonstration by the Geomembrane Installer using prequalification test seams to demonstrate that seams comply with the specification.

3.3.4. Seaming shall primarily be performed using automatic fusion welding equipment and techniques. Use of extrusion welding takes place where fusion welding is not possible such as at pipe penetrations, patches, repairs and short (less than a roll width) runs of seams.

3.3.5. In the case of fish mouths or excessive wrinkles at the seam overlap section, cut along the ridge of the wrinkles on the back into the panel if necessary. Terminate

the cut with a keyhole cut (nominal 10 mm (1/2 in) diameter hole) minimizing the crack/tear propagation. Then, seam the overlay. Patch the key hole cut with an oval or round patch of the same base geomembrane material extending a minimum of 150 mm (6 in.) beyond the cut in all directions.

3.3.6. When extrusion welding 60 mil (1.5mm) or greater HDPE, it is advisable to bevel the top portion of the seam in a lengthwise direction to maximize intimate contact of material and improve continuity of weld.

3.3.7. Prior to seaming, confirm the area for welding is free of moisture, dirt and any foreign matter that can affect the integrity of the weld on an ongoing basis.

3.3.8. Take precaution and safety of the liner technicians, in extreme heat or cold, which can affect the health of the individuals.

3.3.9. Seaming should run through the Anchor Trench to terminate at the end of the sheet goods.

3.4 Pipe and Structure Penetration Sealing System

3.4.1. Provide penetration-sealing system as shown in the Project Drawings.

3.4.2. Construct all penetrations from the base geomembrane material, flat stock, prefabricated boots and accessories as shown on the Project Drawings. In the case of Structured Liners such as SuperGripNet™, DrainLiner™ or similar materials offered by Agru America, Inc, use the smooth or textured liner of the same density for such fabrications. Weld the pre-fabricated or field fabricated assembly to the geomembrane as shown on the Project Drawings to prevent leakage. Once complete, test the assembly as outlined in section 3.05.B. If the Installer cannot perform the field non-destructive testing, attachments will be field spark tested by standard holiday leak detectors in accordance with ASTM

6365. Spark testing should be done in areas where both air pressure testing and vacuum testing is not possible.

3.4.2.1. Equipment for Spark testing shall be comprised of but not limited to; a hand held holiday spark tester, and conductive wand that generates a high voltage.

3.4.2.2. The testing steps performed by the Geomembrane Installer include:

3.4.2.2.1. Place an electrically conductive tape or wire beneath the seam prior to welding.

3.4.2.2.2. Complete a calibration test on a trial seam containing a non-welded segment ensuring the identification of such a defect (non-welded segment) under the planned machine settings and procedures.

3.4.2.2.3. Upon completion of the weld, enable the spark tester and hold approximately 25mm (1 in) above the weld moving slowly over the entire length of the weld in accordance with ASTM 6365. If no spark occurs, the weld is leak free.

3.4.2.3. A spark indicates a hole in the seam. The Geomembrane Installer locates, repairs, and retests the faulty area.

3.4.2.4. When flammable gasses are present, use special care and precautions in the area to be tested.

3.5. Field Quality Control

The Owner's Representative must receive information prior to all pre qualification and production welding and testing, or as agreed upon in the pre construction meeting.

3.5.1. Prequalification Test Seams

3.5.1.1. The Geomembrane Installer tests seams and prepares seams verify seaming parameters (speed, temperature and pressure of welding equipment) are adequate.

3.5.1.2. Each welding technician creates seams and tests each in accordance with ASTM D 4437 at the beginning of each seaming period. Welding technicians test the seaming under the same conditions and with the same equipment and operator combination as production seaming. The test seam shall be approximately 3.3 meters (10 feet) long for fusion welding and 1 meter (3 feet) long for extrusion welding with the seam centered lengthwise. At a minimum, each welding technician creates one test seam after seaming 4–6 hours; additional tests may be required with changes in environmental conditions.

3.5.1.3. Two 25 mm (1 in) wide specimens shall be die-cut by the Geomembrane Installer from each end of the test seam. The specimens tested by the Geomembrane Installer require using a field tension meter testing both tracks for peel strength and shear strength. Each specimen should fail in the parent material and not in the weld, "Film Tear Bond"(F.T.B. failure). When the seam separation is equal to or greater than 25% of the track width, it is a failed test.

3.5.1.4. Listed in the Tables in Section 5 provide the minimum acceptable seam strength values obtained for all specimens tested. Four specimens out of five must meet the acceptable seam strength values for consideration as passing.

3.5.1.5. If a test seam fails, the welding technician must immediately conduct an additional test seam. If the additional test seam fails, the welding technician rejects the seaming apparatus. The technician must correct the apparatus deficiencies and produce a successful test seam before using the apparatus for any other/additional production seaming.

3.5.1.6. The technician labels a sample from each test seam. The label indicates the date, geomembrane temperature, number of the seaming unit, technician performing the test seam and pass or fail description. The technician then gives the sample to the Owner's Representative for archiving.

3.5.2. Field Seam Non-destructive Testing

3.5.2.1. The technician non-destructively tests over the full seam length before the Geomembrane Installer covers it. Numbered or otherwise designated, each seam's label includes the location, date, test unit, name of tester and outcome of all non-destructive testing. Once recorded, the technician submits the information to the Owner's Representative.

3.5.2.2. Testing should be done as the seaming work progresses, not at the completion of all field seaming, unless agreed to in advance by the Owner's Representative. All defects found during testing shall be numbered and marked immediately after detection. The technician must repair, retest, and remark all defects indicating the acceptable completion of the repair.

3.5.3. Non-destructive testing shall be performed using vacuum box, air pressure or spark testing equipment.

3.5.4. Experienced technicians familiar with the specified test methods perform all non-destructive tests. The Geomembrane Installer demonstrates all test methods verifying the validity of said test procedures for the Owner's Representative.

3.5.5. The Geomembrane Installer tests all extrusion seams using a vacuum box in accordance with ASTM D 4437 and ASTM D 5641 and the following equipment and procedures:

3.5.5.1. Equipment for testing extrusion seams is not limited to but should include:

3.5.5.1.1. A vacuum box assembly consisting of a rigid housing,

3.5.5.1.2. A transparent viewing window,

3.5.5.1.3. A soft rubber gasket attached to the base,

3.5.5.1.4. Port hole or valve assembly and a vacuum gauge,

3.5.5.1.5. A vacuum pump assembly equipped with a pressure controller and pipe connections,

3.5.5.1.6. A rubber pressure/vacuum hose with fittings and connections,

3.5.5.1.7. A plastic bucket,

3.5.5.1.8. A wide paintbrush or mop, and

3.5.5.1.9. A soapy solution.

3.5.5.2. The Geomembrane Installer must charge the vacuum pump and adjust the tank pressure to approximately 35 kPa (5 psig).

3.5.5.3. The Geomembrane Installer shall create a leak tight seal between the gasket and geomembrane interface by wetting a strip of geomembrane approximately 0.3m (12 in) by 1.2m (48 in) (length and width of box) with a soapy solution, placing the box over the wetted area, and then compressing the box against the geomembrane. The Geomembrane Installer shall then close the bleed valve, open the vacuum valve, maintain initial pressure of approximately 35 kPa (5 psig) for approximately 3-4 seconds. The Installer must continuously examine the geomembrane through the viewing window for the presence of soap bubbles, indicating a leak. If no bubbles appear after 3-4 seconds, consider the area leak free. Once the area is leak free, depressurize the box and move it over the next adjoining area with an appropriate overlap and the process repeated.

3.5.5.4. All areas where soap bubbles appear shall be marked, repaired and then retested.

3.5.5.5. At seam locations where the Installer is unable to non-destructively test, such as pipe penetrations, the Installer must substitute alternate non-destructive spark testing (as outlined in section 3.04.B) or equivalent.

3.5.5.6. All seams that are vacuum tested shall be marked with the date tested, the name of the technician performing the test and the results of the test.

3.5.6. Double Fusion seams with an enclosed channel shall be air pressure tested by the Geomembrane Installer in accordance with ASTM D 5820 and ASTM D 4437 and the following equipment guidelines and procedures.

3.5.6.1. Equipment for testing double fusion seams shall be comprised of but not limited to: an air pump equipped with a pressure gauge capable of generating and sustaining a pressure of 210 kPa (30 psig), mounted on a cushion to protect the geomembrane; and a manometer equipped with a sharp hollow needle or other approved pressure feed device.

3.5.6.2. The Geomembrane Installer completes all testing activities. Both ends of the seam to be tested are sealed and a needle or other approved pressure feed device inserted into the tunnel created by the double wedge fusion weld. The air pump shall be adjusted to a pressure of 210 kPa (30 psig), and the valve closed. Allow 2 minutes for the injected air to come to equilibrium in the channel, and sustain pressure for 5 minutes.

If pressure loss does not exceed 28 kPa (4 psig) after the five-minute period, the Installer considers the seam leak tight. Release pressure from the opposite end verifying pressure drop on needle to ensure testing of the entire seam. The needle or other approved pressure feed device shall be removed and the feedhole sealed.

3.5.6.3. If loss of pressure exceeds 28 kPa (4 psig) during the testing period or pressure does not stabilize, the Geomembrane Installer locates, repairs and retests the faulty area.

3.5.6.4. Record all results of the pressure testing on the liner at the seam tested and on a pressure testing record.

3.5.6.5. If release of pressure from opposite end of tested seam does NOT deflate seam, the Installer takes measures to determine the cause and remedies to air test 100% of the seam under scrutiny.

3.5.7. Destructive Field Seam Testing

3.5.7.1. The Installer analyzes one destructive test sample per 150 linear m (500 linear ft) seam length or the Geomembrane Installer shall take another predetermined length in accordance with GRI GM 14 from a location specified by the Owner's Representative. The Geomembrane

Installer receives the sample locations without advance notice of the locations. The Geomembrane Installer cuts samples as directed by the Owner's Representative before the complete installation and as seaming progresses.

3.5.7.2. All field samples shall be marked with their sample number and seam number including the sample number, date, time, location, and seam number recorded. The Geomembrane Installer shall repair all holes in the geomembrane resulting from obtaining the seam samples. All patches shall be vacuum box tested or spark tested. If the installation of a permanent patch over the test location the same day of sample collection is not possible, place a temporary patch either tack welded or hot air welded over the opening until affixing a permanent patch.

3.5.7.3. Testing requires the destructive samples size at least 300 mm (12 in) wide, 1m (36 in) long, with the seam centered lengthwise. The sample shall be cut into three equal sections and distributed as follows: one section given to the Owner's Representative as an archive sample; one section given to the Owner's Representative for laboratory testing as specified in paragraph 5 below; and one section retained by the Geomembrane Installer for field testing as specified in paragraph 4 below.

3.5.7.4. For field-testing, the Geomembrane Installer shall cut 10 identical 25 mm (1 in) wide replicate specimens from his sample. The Geomembrane Installer shall test five specimens for seam shear strength and five for peel strength. The Geomembrane Installer performs peel tests on both the inside and outside weld tracks. To be acceptable, four (4) of five (5) test specimens must pass the stated criteria in section 2.02 with less than 25% separation. If four (4) of five (5) specimens pass, the sample qualifies for testing by the testing laboratory if required.

3.5.7.5. If the specifications require an independent seam testing, conduct the testing in accordance with ASTM 5820 or ASTM D4437.

3.5.7.6. Prepare and submit all reports of the results of examinations and testing to the Owner's Representative.

3.5.7.7. For field seams, if a laboratory test fails, it is an indicator of the possible inadequacy of the entire seamed length corresponding to the test sample. The Geomembrane Installer should take additional destructive test portions at locations indicated by the Engineer; (typically 3 m (10 ft) on either side of the failed sample) and perform additional laboratory seam tests. Passing tests shall be an indicator of adequate seams. Failing tests shall be an indicator of non-adequate seams. When seams fail the destructive test, the Installer re-seams or repairs seams with a cap-strip. Cap-strip seams shall be non-destructively vacuum box tested until achieving adequacy of the seams. The Geomembrane Installer must destructively test all Cap strip seams exceeding 50 M in length (150 FT).

3.5.7.8. The Installer keeps all samples out of critical areas such as in the bottom of ponds and other locations such as slopes and sumps.

3.5.8. Identification of Defects

3.5.8.1. The Installer and Owner's Representative inspects panels and seams during and after panel deployment to identify all defects, including holes, blisters, un-dispersed raw materials and signs of contamination by foreign matter.

3.5.9. Evaluation of Defects: The Installer must complete a non-destructive test for each suspect location on the liner (both in seam and non-seam areas) using one of the methods described in Section 3.05.B. Each location failing non-destructive testing is marked, numbered, measured and posted on the daily "installation" drawings and subsequently repaired.

3.5.9.1. If a destructive sample fails the field or laboratory test, the Geomembrane Installer shall repair the seam between the two

nearest passed locations on both sides of the failed destructive sample location.

3.5.9.2. All repairs of defective seams, tears or holes use either re-seaming or applying an extrusion welded cap strip process.

3.5.9.3. Re-seaming may consist of either:

3.5.9.3.1. Removing the defective weld area and re-welding the parent material using the original welding equipment; or

3.5.9.3.2. Re-seam the defective weld area by extrusion welding along the overlap at the outside seam edge left by the fusion welding process.

3.5.9.3.3. Cap stripping entire faulty seam.

3.5.9.4. The Installer repairs blisters, larger holes, and contamination by foreign matter using required patches and/or extrusion weld beads. Each patch shall extend a minimum of 150 mm (6 in) beyond all edges of the defects.

3.5.9.5. Locate, measure and record all repairs.

3.5.10. Verification of Repairs on Seams: Each repair requires a non-destructive test using either vacuum box or spark testing methods. An indication of a successful repair includes areas passing the non-destructive test. Areas failing the tests require re-seaming and retesting until results show a passing test. Requirements for areas failing the tests include re-seaming and retesting until passing test results. The Installer records the number, date, location, technician and test outcome of each patch.

3.5.11. Daily Field Installation Reports: At the beginning of each day's work, the Installer shall provide the Engineer with daily reports for all work accomplished on the previous workday. Reports shall include the following:

3.5.11.1. Total amount and location of geomembrane placed

3.5.11.2. Total length and location of seams completed, name of technicians doing seaming and welding unit numbers

3.5.11.3. Drawings of the previous day's installed geomembrane showing panel numbers, seam numbers and locations of non-destructive and destructive testing

3.5.11.4. Results of pre-qualification test seams

3.5.11.5. Results of non-destructive testing

3.5.11.6. Results of vacuum testing of repairs

3.5.12. Prior to covering the liner, report all Destructive test results.

3.5.13. Perform and complete all quality assurance no more than 72 hours after geomembrane deployment.

3.6 Liner Acceptance

3.6.1. The Owner's Representative accepts the Geomembrane liner when:

3.6.1.1.1. The entire installation is completed or an agreed upon subsection of the installation is finished.

3.6.1.2. The Installer submits all completed QC documentation to the owner.

36.1.3. Verification of the adequacy of all field seams and repairs and associated geomembrane testing is complete.

3.6.1.4. All submittals are accepted.

3.07 Anchor Trench

Construct as specified on the project drawings.

3.8 Disposal of Scrap Materials

3.8.1. On completion of installation, the Geomembrane Installer shall dispose of all trash and scrap material in a location approved by the Owner, remove equipment used in connection with the work herein, and shall leave the premises in a neat acceptable manner. Finally, remove all scrap material from the surface of the geomembrane.

4. MEASUREMENT AND PAYMENT

The project specifications document/outline the required measurements and payment of services. All parties sign all documents prior to project start up.

5. GEOTEXTILES, GEONETS and GEOCOMPOSITES

5.1 Geotextiles

The general arrangement of Geotextiles includes aligning seams parallel to the prevailing slope and seams finished by either heat seaming with an approved hand held or self-motivated thermal device or by sewing with a stitching approved by the engineer. Whichever stitching method is used, the thread should be compatible with the fabric and have similar chemical resistance to the liner used.

5.2 Geonet

Geonet may be butt joined or lapped if specified. At five-foot (5'/1.5m) intervals along the edge, the Installer applies Nylon/plastic cable ties to the net edge.
Complete end splices as follows:

1. On slopes, the ends will overlap two feet (2'/0.6m) with uphill panels on top and two (2) rows of cable ties applied at 6" spacing or per engineers specification.
2. In flat areas, the ends will overlap a minimum to six inches (6"/15 cm) and one (1) row of three (3) cable ties applied.

5.3 Geocomposites

Geocomposites can overlap with the net portion tied and the Geotextile portion thermally bonded or seamed as required by the project specifications.

5.4 Repairs

Repair any holes, tears, or burns through the Geotextile from thermal seaming by patching with the same Geotextile. The patch will be a minimum of twelve inches (12"/30cm) larger (in all directions) than the area repaired and will be spot bonded thermally. Repair all geonet holes and/or tears using a patch of the same geonet. Patches are a minimum of twelve inches (12"/30cm) larger in all directions than the area repaired. Tie the patch in place using a minimum of four (4) nylon cable ties.

6.0 - TABLES

"This section shall include the current GRI GM13 (HDPE) or GRI GM17 (LLDPE) manufacturer's specification or a revision of GRI GM13 (HDPE) or GRI GM 17 (LLDPE) specific to the unique project requirements and/or standards, as determined by the owner or owners' agent." TO BE INSERTED BY COMPANY PREPARING SUBMITTALS TO GUARANTEE MOST CURRENT GRI SPECIFICATION.

SEAM STRENGTHS - HDPE and LLDPE GRI GM 19

Table 1: Seam Strength and related Properties of Thermally Bonded Smooth and Textured **High Density Polyethylene (HDPE)** Geomembrane **(English Units)**

Geomembrane Nominal Thickness	**30 mils**	**40 mils**	**50 mils**	**60 mils**	**80 mils**	**100 mils**	**120 mils**
Hot Wedge Seams (1)							
shear strength(2), lb/in.	**57**	**80**	**100**	**120**	**160**	**200**	**240**
shear elongation at break(3) , %	50	50	50	50	50	50	50
peel strength (2), lb/in.	**45**	**60**	**76**	**91**	**121**	**151**	**181**
peel separation, %	25	25	25	25	25	25	25
Extrusion Fillet Seams (1)							
shear strength(2), lb/in.	**57**	**80**	**100**	**120**	**160**	**200**	**240**
shear elongation at break(3) , %	50	50	50	50	50	50	50
peel strength (2), lb/in.	**39**	**52**	**65**	**78**	**104**	**130**	**156**
peel separation, %	25	25	25	25	25	25	25

Notes for Table 1 – (Used also for hot air and ultrasonic seaming methods.)

1. Value listed for shear and peel strength are for 4 out of 5 test specimens; the 5th specimen can be low as 80% of the listed values
2. Elongation measurements should be omitted for field testing

Table 2: Seam Strength and related Properties of Thermally Bonded Smooth and Textured **Linear Low Density Polyethylene (LLDPE)** Geomembrane (**English Units)**

Geomembrane Nominal Thickness	**30 mils**	**40 mils**	**50 mils**	**60 mils**	**80 mils**	**100 mils**	**120 mils**
Hot Wedge Seams [1]							
shear strength[2], lb/in.	**45**	**60**	**75**	**90**	**120**	**150**	**180**
shear elongation at	50	50	50	50	50	50	50
break[3] , %	**38**	**50**	**63**	**75**	**100**	**125**	**150**
peel strength [2], lb/in.	25	25	25	25	25	25	25
peel separation, %							
Extrusion Fillet Seams [1]							
shear strength[2], lb/in.	**45**	**60**	**75**	**90**	**120**	**150**	**180**
shear elongation at	50	50	50	50	50	50	50
break[3] %	**34**	**44**	**57**	**66**	**88**	**114**	**136**
peel strength [2], lb/in.	25	25	25	25	25	25	25
peel separation, %							

Notes for Table 2 - Also for hot air and ultrasonic seaming methods

1. *Value listed for shear and peel strength are for 4 out of 5 test specimens; the 5th specimen can be low as 80% of the listed values*
2. *Elongation measurements should be omitted for field testing*

Non-Destructive Air Channel Test

Table 3: Initial Pressure Schedule

		Field Testing
Material	Minimum PSI	Maximum PSI
30 mil	15	30
40 mil	20	30
60 mil	24	30
80 mil	24	30
100 mil	24	32

Table 4: Maximum Allowable Pressure Drop

Material Field Test (after five minutes)

30 mil 4 PSI
40 mil 4 PSI
60 mil 4 PSI
80 mil 4 PSI
100 mil 4 PSI

Note: At all times before heat sealing the end of the seam, the operator should insure that the void or air channel is free of obstruction.

Agru America, Inc. is not an installer of Geosynthetics and does not represent as such. Agru America, Inc. developed this manual only as a guideline and not as an authority of exactitude. Agru America will not be held liable for the installation of others.

Appendix B

Manufacturing Quality Control Manual

MANUFACTURING QUALITY CONTROL

SALES OFFICE:

AGRU AMERICA, INC.

500 Garrison Road

Georgetown, SC 29440

Toll Free: (800) 373-2478

Telephone: (843) 546-0600

Fax: (843) 527-2738

salesmkg@agruamerica.com

www.agruamerica.com

AGRU AMERICA, INC. - QA/QC

Manufacturing – Quality Assurance/Quality Control

AGRU AMERICA, Inc. extrudes high density polyethylene (HDPE) and linear low density polyethylene (LLDPE) geomembrane, HDPE Geonet, and Geocomposite products at its plant located at 500 Garrison Road, Georgetown, South Carolina, 29440.

Our USA Manufacturing Quality Assurance Program is dependent on the utilization of an in-house laboratory which is, when necessary, complemented with testing performed by certified outside laboratories such as:

- Precision Geosynthetic Laboratories; Anaheim, CA
  Telephone (714) 520-9631; Fax (714) 520-9637
- TRI/Environmental, Inc.; Austin, Texas
  Telephone (512) 263-2101; Fax (512) 263-2558

  And other GRI-LAP accredited laboratories.

Raw Material – Manufacturer's Certificate of Conformity

HDPE and LLDPE resin is supplied to our plant in bulk and subjected to the following procedures:

- Prior to shipment, our resin supplier submits a certificate of analysis. Once approved, the resin is released for shipment to our plant.
- One sample is taken from each rail car after arrival and tested as follows:
  Melt Index ASTM D1238 190°C, 2.16kg, and Density ASTM D792.
- Once the tests have been completed and results found to be in compliance with our requirements, the resin is then unloaded into our silo system.
- At this stage, our supplier has performed one battery of tests and Agru America has performed one to verify the manufacturer's certificate of analysis.
- Off specification resin is returned to the supplier.
- The Manufacturer's MFI Test Data is reported on the Quality Certificate (Agru America's MFI Testing is done to verify this data).

GEOMEMBRANE

The Extrusion Process

The resin is conveyed through a vacuum pump system and flexible hoses to a dryer hopper, feeding the resin by gravity into an 8-inch barrel. This barrel is divided into five heating zones, each heating zone being computer controlled and constantly monitored.

A screw in the barrel turns at a prescribed and monitored speed. It conveys the resin slowly to full plastication, and then the plasticated resin is fed through a manifold into a coat hanger die having a width of approximately 24 feet. The die lips are open to a prescribed distance governed by the thickness of the geomembrane to be extruded.

Exiting the die, the plasticated resin forms a controlled and monitored bead, which feeds into a chrome three-roll stack in a prescribed pattern. Each chrome roll is set at a prescribed temperature, controlled by water circulation.

Exiting the controlled cooling of the roll stack, the geomembrane travels down the take off haulers towards the winder. On the way to the take off, the liner is trimmed to bring the finished width to the applicable standard. Trimmings are granulated.

The trimmed edge of one side of the geomembrane is marked at every 3.28 ft with thickness, Agru America name and year of manufacture. This marking also serves as product identification.

The geomembrane is visually inspected for surface defects as it travels down the take off by both the extruder and the winder operators.

The geomembrane is wound on a recycled HDPE core having 6" ID (150mm), 7" OD (175mm) and 22'8" (6.8m) length. Each smooth roll weighs approximately 3,000 pounds (1360 kg). Microspike® rolls weigh approximately 3,200 pounds (1450 kg). All rolls are fitted with two nylon slings when shipped.

Post Extrusion Quality Control

Once start-up conditions are over and commercial extrusion is initiated, post-production quality control comes into operation. A series of test procedures are performed based upon either our Standard Frequency of testing (attached), or frequencies required by customer specifications.

A sample approximately 11" by the full width of the geomembrane is taken from every roll. Based on the specified test frequencies, certain specimens are die cut, tested and the results summarized on the Quality Certificate issued by our Quality Control Department. The certificate is signed electronically by the Quality Control Manager. The Quality Control Manager reports directly to the President of the Company.

Rolls failing to comply with either Customer Project Specifications and/or our own latest revision to our published data sheets are set aside and re-classified as off-spec (Class B rolls).

Quality Certificates are provided for all rolls of geomembranes (sample smooth & Microspike® certificates are attached). with the exception of off-spec (Class B rolls).

Sometimes a third party Quality Assurance representative is mandated by the owner of a project to oversee our manufacturing QA. We gladly subscribe to this procedure and make all our records available 24 hours a day for the duration of the mandate.

The following roll identification items are reported in our Quality Certificate:

Roll number

(example) **203366 -06**

First digit	machine
Second and third digits	week of year
Fourth digit	day of week (Monday=1, Sunday=7)
Last two digits	roll number (first roll of week is 01, etc.)

The two last digits separated from the others indicate the year the roll was produced.

Using the above key:

Roll #203366 -06 was produced on Liner Machine #2 on Wednesday in the third week in 2006.

Product Description (liner type: Smooth, Microspike®, Drain®, Super Gripnet®, etc.)

Roll Length & Width in feet & meters

Raw material lot and/or batch number and supplier/product identification (from Resin Manufacturer's Certificate of Analysis – sample attached)

The following test results are reported in the Geomembrane Quality Certificate, derived from our Standard Test Frequency (attached) and/or supplied raw material manufacturer Certificates of Analysis:

Test / Method	Results Reported & Modifications to Standard (if any)
Thickness †ASTM D5199(Smooth), or †D5994(Textured) **(Both Modified)**	Minimum, Maximum, and Average Sheet Thickness in mm and mils. **Modification from Standard** = Measurements are taken upon sample reaching Lab Temperature Equilibrium.
Asperity Height †GRI GM12 **(Modified)** Textured liner only	Asperity height in mils **Modifications from Standard** = Edge samples are collected from the smooth/textured junction, **not** 1 foot from edge. ASTM D5994 specimens are used for this test, not direct placement.
Density †ASTM D792	Density in g/cc
Melt Flow Index †ASTM D1238	g/10minutes (Conditions =190°C, 2.16kg). **NOTE:** Resin Manufacturer's **Certificate of Analysis result** is reported. Our testing verifies this result.
Carbon Black Content †ASTM D4218	% Carbon Black by weight
Carbon Black Dispersion †ASTM D5596	Category (Only near spherical agglomerates per GRI GM 13 & 17)
Tensile Strength †ASTM D6693 Type IV, 2 inches / minute **(Modified)**	Average Strength @ Yield in psi, ppi, & N/mm Average Strength @ Break in psi, ppi, & N/mm Average Elongation @ Yield in % Average Elongation @ Break in % **Modification from Standard** = Average of MD & TD results are reported **NOTE 1:** The D6693 results equate to the following **D638 Modifications**: Gage Length for Yield = 1.3", for Break = 2" **NOTE 2:** Yield data not reported for LLDPE
Dimensional Stability †ASTM D1204 **(Modified)**	Average Dimensional Change in % **Modification from Standard** = Average Dimensional Change of MD & TD is reported. Test is run upon sample reaching Lab Temperature Equilibrium
Tear Resistance †ASTM D1004 **(Modified)**	Tear Resistance in Lbs & N. **Modifications from Standard** = Test is run upon sample reaching Lab Temperature Equilibrium. Average Tear Resistance of MD & TD is reported.
Puncture Resistance †ASTM D4833 †FTMS 101C Method 2065 **(Both Modified)**	Puncture Resistance in Lbs & N. **Modification from Standard** = Test is run upon sample reaching Lab Temperature Equilibrium.
Environmental Stress Crack Resistance (ESCR) †ASTM D1693 **(CERTIFIED)**	This test is n longer run by Agru America, and the result is now certified by Agru America for 1500 hours (Certification letter is attached, as well as GAI-LAP's approval of the certification.)
Notched Constant Tensile Load †ASTM D5397 (Single Point, Appx.)	Pass / Fail at 300 hours (or as required by customer specifications) This test run on HDPE only, and on smooth edge of textured liners.
Oxidative Induction Time (OIT) †ASTM D3895 Standard, 200°C, 1atm.	OIT Time in minutes. **Modification from Standard** = One run only – if result is below 120 minutes, a second run is done to verify the first.

†GRI-LAP Accredited for this method (INCLUDING Modifications)

The following Test methods are also performed per railcar in our Standard MQC, but results are **not** reported on our Quality Certificates (results can be forwarded if necessary).

Test / Method	Results Reported
Low Temperature Brittleness ASTM D746 **THIS TEST OUTSOURCED TO AN ACCREDITED 3rd PARTY LAB**	Pass / Fail for each specimen (5 specimens in both MD & TD), % of samples passing. **NOTE:** Standard MQC Temperature tested to is **-60°C**. Lower Temperatures can be done if required by customer specifications.

Additional Test Procedures
(Available if Specified from GRI-LAP Accredited Third Party Labs)

Hydrostatic Resistance	ASTM D751
Volatile Loss	ASTM D1203
Resistance to Soil Burial	ASTM D3083 using ASTM D638 Type IV dumbbell at 2"/min.
Water Absorption	ASTM D570
Coefficient of Thermal Expansion	ASTM D696
Friction Angle Direct Shear Method	ASTM D5321
Moisture Vapor Transmission Rate 100°F - 100% RH	ASTM E96
Transmissivity (Profiled) Various gradients & confining pressure	ASTM D4716
Multi-axial Tensile Strain at Rupture (percent)	ASTM D5617
Modulus of Elasticity (or 2% Secant Modulus)	ASTM D638 (Modulus) or ASTM D5323

Drainage Net (Geonet)

AGRU America drainage net is made from a blend of high quality virgin HDPE and a carbon black masterbatch. The purpose of the carbon black is to protect the plastic from UV damage in the field application.

All raw materials as well as the finished products are conistently monitored by specially trained lab technicians. Raw materials are tested as above for Geomembrane.

The blend of raw materials is plasticized by an extruder, which presses the melt through a screen changer to filter out impurities. The plastic is then fed into a rotating die which creates the net. The cooling of the net takes place in a water tank at a tightly controlled temperature. A series of nip rollers pull the net out of the tank and through the downstream equipment to the winders. The net is cut to length automatically and wound onto a 4" OD cardboard core.

Before the finished rolls are taken out of the winder frame, the quality control technician either releases the material into stock or classifies the material as scrap.

When approved by QC, the rolls are stretch wrapped and transferred to the storage yard.

Geocomposite

In addition to the drainage net, AGRU America offers geocomposites which consist of geotextiles laminated to one or both sides of the net.

All geotextiles used for this lamination process are being inspected to meet AGRU America's (or project) specifications.

The lamination process takes place just before the net reaches the winders at the end of the extrusion line. After melting the surface of the HDPE drainage net, a geotextile is pressed into the net by means of a calender. The outer 6 inches of net are not laminated and the geotextile overlaps the net by an additional 6 inches on both sides of the product.

Before the finished rolls are taken out of the winder frame, the quality control technician either releases the material into stock or classifies the material as scrap.
When approved by QC, the rolls are stretch wrapped and transferred to the storage yard.

All drainage net and geocomposite rolls are labeled as follows:

- one label on each face of the roll
- two hand written roll numbers on the stretch wrap packaging
- one label on the laboratory sample
- numbering system is as above for geomembrane

The following test results are reported in the Geonet/Composite Quality Certificate, derived from our Test Results and/or supplied raw material manufacturer Certificates of Analysis:

Test / Method	Results Reported & Modifications to Standard (if any)
Thickness (Geonet) †ASTM D5199	Minimum, Maximum, and Average Geonet Thickness in mm and mils. **Modification from Standard** = Measurements are taken upon sample reaching Lab Temperature Equilibrium. English Units reported
Density (Geonet) †ASTM D792	Geonet Density in g/cc
Melt Flow Index (Geonet) †ASTM D1238	g/10minutes (Conditions =190°C, 2.16kg). **NOTE:** Resin Manufacturer's **Certificate of Analysis result** is reported. Our testing verifies this result.
Carbon Black Content (Geonet) †ASTM D4218	% Carbon Black by weight
Peak Tensile Strength (Geonet) †ASTM D5035 or †ASTM D7179 **(Both Modified)**	MD Only tested, TD upon request only. Peak Strength @ Break in ppi **Modification from Standard** = English Units reported
Mass Per Unit Area (Geonet) †ASTM D5261	Average Mass per Unit Area in lb/ft^2 **Modification from Standard** = English Units reported
Transmissivity (Geonet) †ASTM D4716	Transmissivity, m^2 / sec Plate to Plate , 21°C, **gradient = 0.1, load = 10,000psf, seat time = 15 minutes** is Agru America's Standard Geonet MQC Transmissivity test (may be changed per project MQC specs)
Transmissivity (Geocomposite) †ASTM D4716	Transmissivity, m^2 / sec Plate to Plate , 21°C, **gradient = 0.1, load = 10,000psf, seat time = 15 minutes** is Agru America's Standard Geocomposite MQC Transmissivity test (may be changed per project MQC specs)
Ply Adhesion (Geocomposite) †ASTM D7005	Peel Strength, lbs/in, min. ave.

†**GRI-LAP Accredited for this method (INCLUDING Modifications)**

Appendix C

Installer Construction Quality Control Manual

NORTHWEST LININGS &
GEOTEXTILE PRODUCTS, Inc.
"Helping to Protect the Environment"
21000 77th Avenue South
Kent, WA 98032
(253) 872-0244 • (800) 729-6954
FAX: (253) 872-0245
www.northwestlinings.com

NORTHWEST LININGS & GEOTEXTILES PRODUCTS, INC.
CONSTRUCTION QUALITY CONTROL MANUAL
FOR HDPE AND LLDPE CONTAINMENT MEMBRANE
FIELD INSTALLATIONS

NORTHWEST LININGS AND GEOTEXTILES
HDPE/LLDPE-FIELD QUALITY CONTROL MANUAL

I. INTRODUCTION

A. This manual describes the Quality Control Procedures utilized by Northwest Linings (NWL) Installation Personnel to assure quality workmanship and installation integrity of HDPE/LLDPE Geomembranes.

B. Geosynthetic components of lining systems which are addressed in this manual are HDPE/LLDPE Geomembranes. NWL recognizes that specific documentation of the specific installation is required to substantiate this Quality Control Program.

II. HDPE/LLDPE GEOMEMBRANE INSTALLATION

A. Earth Work

1. The general and/or earthwork contractor shall be responsible for preparing and maintaining the subgrade in a condition suitable for liner installation unless agreed otherwise.

2. Surfaces to be lined shall be smooth and free of debris, roots, and angular or sharp rocks to a depth of four (4) inches. All fill shall consist of well-graded material free of organics, trash, clayballs or other harmful matter. No sharp edged stones, stones larger than one (1) inch diameter or hard objects shall be allowed within the top four (4) inches of the subgrade. The surface shall be compacted in accordance with project specifications but in no event below the minimum required to provide a firm unyielding foundation sufficient to permit the movement of deployment vehicles and welding equipment over the surface without causing rutting or other harmful effects. The subgrade shall have no sudden sharp or abrupt changes in grade.

3. The earthwork contractor shall protect the subgrade from becoming too dry, flooding and freezing. Protection, if required, may consist of a thin plastic protective cover (or other material as approved by the engineer) installed over the subgrade until the placement of the liner begins. Subgrade found to have cracks greater than 1/2 inch in width or depth or which exhibit swelling, heaving or other similar conditions shall be reworked by the general contractor to remove these defects.

4. Surface acceptance: Upon request, NWL will provide the Owner's Representative with a written acceptance of the surface lined. This acceptance will be limited to an amount of area that NWL linied in a particular work shift. Subsequent repairs to the subgrade and the surface shall remain the responsibility of the earthwork contractor.

B. Crest Anchorage System

1. The anchor trench shall be excavated by the earthwork contractor to lines and widths shown on the design drawings prior to geomembrane placement.

2. Anchor trenches excavated in clay soils susceptible to desiccation cracks should be excavated only the distance required for that days liner placement to minimize the potential for cracking of the clay soils.

3. Corners in the anchor trench shall be slightly rounded where the geomembrane enters the trench to minimize sharp bends in the liner.

C. Preparation for Geomembrane Deployment

1. Panel Layout: Prior to liner deployment, layout drawings shall be produced to indicate the panel configuration and location of seams.

2. Identification: Each panel used shall be given a numeric or alpha-numeric identifier with a logical progression. This identification shall also include the date of deployment and manufacturing roll number.

D. Field Panel Placement

1. Location: NWL will attempt to install field panels at the location indicated on the layout drawing. If panels are positioned in a location other than that indicated on the layout drawings, the revised location shall be noted in the field on a layout drawing which will be modified at the completion of the project to reflect actual panel locations.

2. Weather Conditions: Geomembrane deployment shall not be done during any precipitation, in the presence of excessive moisture (i.e. fog, dew), in an area of standing or ponded water, or during high winds.

3. Method of Deployment:

    1. The method and equipment used to deploy the panels must not damage the geomembrane or the supporting subgrade surface.

    2. No personnel working on the liner will smoke, wear shoes that can damage the geomembrane, or engage in actions which could result in damage to the geomembrane.

    3. Adequate temporary ballast and/or anchoring, (i.e. sandbags,) which will not damage the geomembrane, will be placed to prevent uplift of the liner by wind.

    4. The geomembrane will be deployed in a manner to minimize wrinkles.

    5. Any damage to a panel of geomembrane will be repaired in accordance with Section IV. Any area of a panel seriously damaged (torn, twisted, or crimped) will be marked, repaired, and/or removed from the work area with resulting seaming and/or repairs performed in accordance with Section IV of this document.

E. Field Seaming

1. General Requirements:

    1. Layout: In general, seams shall be oriented parallel to the slope (down hill), horizontal seams on slopes shall be kept to a minimum. Whenever possible, horizontal seams should be located not less than five (5) feet from the toe of the slope. Each seam shall be numbered in a manner compatible with the panel layout drawing for documentation of seam testing results.
    2. Personnel: All personnel performing seaming operations shall be trained in the operation of the equipment being used and will qualify by successfully welding a test seam as described herein. The project foreman will provide direct supervision of all personnel seaming to verify proper welding procedures are followed.

F. Equipment:

1. Fusion Welding: Fusion Welding consists of placing a heated wedge, mounted on a self propelled vehicular unit, between two (2) overlapped sheets such that both sheets are heated to temperatures ranging from 600 degrees F. to 850 degrees F. After being heated by the wedge, the overlapped edges pass through a set of preset pressure rollers which compress the panels together forming a continuous homogenous fusion weld. The fusion welder is equipped with a temperature readout device which continuously monitors the temperature of the wedge.

2. Extrusion Fillet Welding: Extrusion welding consists of introducing a ribbon of molten resin along the edge of the seam overlap to the two sheets to be welded. The molten polymer causes some of the material of each sheet to be liquefied resulting in a homogeneous bond between the molten weld bead and the surfaces of the sheets. The extrusion welder is equipped with gauges giving the temperature in the apparatus and the preheat temperature at the nozzle.

G. Seam Preparation:

1. Fusion Welding:

1. Overlap the panels approximately four (4) to 6 (six) inches.

2. Clean the seam area prior to seaming to assure the area is clean and free of moisture, dust, dirt and debris.

3. It is acceptable to grind the overlap at butt seams the facilitate airtesting through this seam area.

4. Adjust the panels so that seams are aligned with the fewest possible number of wrinkles and "fishmouths".

2. Extrusion Welding:

1. Overlap the panels a minimum of three (3) inches.

2. Temporarily bond the panels to be welded taking care not to damage the geomembrane.

3. Clean the seam area prior to seaming to assure the area is clean and free of moisture, dust dirt and debris of any kind prior to grinding.

4. Grind seam overlap and weld within15 minutes of grinding. In manner that does not cause excessive damage the geomembrane.

5. Purge the extruder prior to beginning the seam to remove all heat-degraded Extrudate from the barrel.

6. Keep welding rod clean and dry.

H. Test Seams:

Test seams shall be performed at the beginning of each seaming period or at least once each five to six hours for each seaming apparatus used that day. Test seams shall be made on fragment pieces of the liner and under the same conditions as actual seams.

1. Test Seam Length:

The test seam shall be at least three feet long, made by joining 2 pieces at least 9" in width.

2. Sample Procedures:

1. Visually inspect the seam for squeeze out, footprint, pressure and general appearance.

2. Two samples one inch wide shall be cut from the test seam. The samples shall then be tested in peel and shall not fail in the seam. A passing test shall be exibit film tear bond (FTB). If a sample fails, the entire procedure shall be repeated.

3. If any of the second set of samples fail, the machine shall not be accepted and used for seaming until the problem is corrected and 2 passing tests are achieved.

4. After completion of the test the remaining portion of the test seam shall be discarded. Documentation of the test seams will be maintained by listing date, time (am or pm), machine I.D. number, operators initials, temperature control setting and test results.

5. Passing test results records shall be maintained on NWL's test weld report form.

6. If test samples are to act as destructive samples then the sample shall be marked, logged and saved. I

I. General Seaming Procedures:

1. Seaming shall extend past the outside edge of the comntainment area and can continue to the area to be placed in the anchor trench.
2. While welding a seam, monitor and maintain the proper overlap.
3. Inspect seam area to assure area is clean and free of moisture, dust, dirt and debris of any kind.
4. While welding a seam, monitor temperature gauges to assure proper settings are maintained and that the machine is operating properly.
5. Align wrinkles at the seam overlap to allow welding through a wrinkle.
6. Fishmouths or wrinkles at seam overlaps that cannot be welded through shall be cut along the ridge in order to achieve a flat overlap. The cut area shall be seamed. Any portion where the overlap is inadequate shall be patched with an oval or round patch extending six inches beyond the cut in all directions.
7. All cross/butt seams between two rows of seamed panels shall have the overlaps trimed back to prevent the wedge of the welder from becoming stuck in the overlap. It is acceptable to grind the overlap at butt seams the facilitate airtesting through this seam area.
8. All "T" joints shall have the overlap from the wedge welder seam trimmed back to allow an extrusion fillet weld. Then grind four (4) to six (6) inches on either side of the seam and extrusion weld all of the area prepared by grinding.

J. Weather Conditions:

NWL relies on the experience of the Project Superintendent and the results of test seams to determine seaming restriction by weather. Many factors, such as ambient temperature, humidity, wind, sunshine, etc., can effect the integrity of field seams and must be taken into account when deciding whether or not seaming should proceed. Test seams are required prior to daily production seaming to determine if the weather conditions will effect NWL's ability to produce quality seams. Additional non-destructive and destructive testing of production seams substantiate the decision made by the Project Superintendent to seam on any given day.

SECTION III Seam Testing-Quality & Control-Geomembranes

A. Concept:

NWL installation crews will non-destructively test all field seams over their full length using air pressure testing, vacuum testing or other approved method, to verify the continuity and integrity of the seams.

B. Air Pressure Testing:

The weld seam created by the fusion welding process is composed of two welded seams separated by an unwelded channel approximately 3/8 of an inch wide. This channel permits seams to be tested by inflating the sealed channel with air to a predetermined pressure and observing the stability of the pressurized channel over time.

C. Equipment for air testing:

1. An air pump (manual or motor driven) capable of generating and sustaining a pressure of 30 PSI.
2. A rubber hose with fittings and connections.
3. A sharp hollow needle with a pressure gauge capable of reading and sustaining a pressure of 30 PSI.
4. Procedure for air testing:

5. Seal both ends of the seam to be tested.

6. Insert needle in the sealed channel.

7. Inflate the test channel to a pressure between 25 to 30 PSI, in accordance with the following schedule, close valve, and allow time for the injected air to come into equilibrium in the channel. Observe initial pressure after this time.

INITIAL PRESSURE SCHEDULE*				MAX. PRESSURE DIFF.
MATERIAL	(MIL)	MIN. PSI	MAX. PSI	AFTER 5 MINUTES
	40	25	30	4
	50	26	30	4
	60	27	30	4
	80	30	30	4
	100	30	30	4

8. Observe and record the air pressure five minutes after the relaxing period ends. If loss of pressure exceeds the value above or if the pressure does not stabilize, locate the faulty area and repair.

9. Upon completion of the pressure test the end of the seam opposite the pressure gauge is cut. A decrease in gauge pressure must be observed or the air channel will be considered blocked and the test will be repeated after the blockage is corrected.

10. Remove needle and seal resulting hole by extrusion welding.

11. Record test results on non-destructive test form

12. In the event of a Non-Complying Air pressure test, the following procedure shall be followed.

13. Check seam-end seals and retest seams.

14. If non-compliance reoccurs, cut one inch samples from each end of the seam and additional samples at the distance specified.

15. Perform destructive field peel test on the samples.

16. If all samples pass destructive testing remove the overlap left by the wedge welder and perform an Air Pressure/Soap Test or vacuum test.

17. If a leak is detected by the air pressure/soap or the vacuum test, repair by extrusion welding. Test repair by vacuum testing.

18. If no leak is discovered air pressure/soap testing, the seam will pass non-destructive testing.

19. If no leak is discovered by vacuum testing, the seam will pass non-destructive testing.

20. If one or more samples fail the peel test, additional samples will be taken.

21. When two passing samples are located, the seam between these two locations will be considered complying. The area outside of this length will be considered non-complying and the entire length extrusion welded.

22. Test the entire length of the repaired seam by vacuum testing.

D. Air Pressure Testing/Soap Testing:

This test is used when the seam fails the air pressure test due to slow pressure loss. The procedure is to constantly supply pressure to the seam air channel while spraying the length with a soap and water solution and visually examining the seam for bubbles. Note: This option is not recommended during high wind conditions.

1. Equipment for Air Pressure/Soap Testing:
    1. The same equipment as the air pressure test.
    2. A soap solution and means to apply the solution.
2. Procedure for Air Pressure/Soap Testing:
    1. Trim excess overlap material off at edge of seam
    2. Insert needle gauge assembly in opposite ends of the seam to be tested to show that pressure is continuous throughout the channel.
    3. Maintain 30 psi
    4. Apply soap solution to the weld edge and visually examine for bubbles.
    5. If no bubbles appear the problem is with the inside track "secondary weld". This seam is acceptable providing it has passed peel tests.
    6. If any bubbles appear on the outside track “Primary weld”, repair defect by extrusion welding and vacuum test the repair.

E. Vacuum Testing:

This test is used when the geometry of the weld makes air pressure testing impossible or impractical or when attempting to locate the precise location of a defect believed to exist after air pressure testing.

1. Equipment for vacuum testing:
    1. Vacuum box consisting of a rigid housing, a transparent viewing window, a soft neoprene gasket attached to the bottom, port hole or valve assembly and a vacuum gauge.
    2. Vacuum pump assembly or compressor with a venturi equipped with a pressure controller and pipe connections.
    3. A rubber pressure/vacuum hose with fittings and connections.
    4. A soap solution with a means to apply the solution.
2. Procedure for Vacuum Testing:
    1. Trim excess overlap from seam.
    2. Apply soap solution to the area to be tested.
    3. Place the vacuum box over the area and apply sufficient downward pressure to seal the box against the liner. Activate the vacum motor and look for soap bubbles
    4. Ensure that a leak-tight seal is created.

5. For a period of not less than five seconds, examine the geomembrane through the viewing window for the presence of soap bubbles.

6. If no bubbles appear after five seconds, turn off the motor and move overlap and repeat the process.

3. Procedure for non-complying test:

1. Mark all areas where soap bubbles appear and repair the marked areas.

2. Retest repaired areas.

F. Destructive Testing:

The purpose of destructive testing is to determine and evaluate seam strength. These tests require direct sampling and thus subsequent patching. therefore destructive testing should be held to a minimum to reduce the amount of repairs required.

1. Procedure for Destructive Testing:

1.1. Destructive test samples shall be marked and cut out randomly at a minimum average frequency of one test location every 500 feet of seam length.

1.2. Additional test may be taken in areas of contamination, offset welds, visible crystallinity or other potential cause of faulty welds.

1) Sample Size:

a) The sample should be twelve inches wide with a seam fourteen inches long centered lengthwise in the sample. The sample may be increased in size to accommodate independent lab testing by the owner or by specific project specifications.

b) Ten one inch sample shall be cut from each end of the test seam for field testing on a calibrated field tensiometer. 5 in Peel and 5 in Shear.

2) If field peel samples pass with FTB and the shear samples pass it will be assumed the sample passes destructive testing. An additional portion of the sample test strip can be sent to a third party laboratory for testing to evaluate seam strength and confirm field testing if required.

a) Procedure in the event of Destructive Test Failure:

1. Cut additional field samples for testing a minimum of ten (10) feet either side of the Test test these according to section 2. If the samples pass then reconstruct seam between the passing samples with the extrusion welder.

2. Heat tack the overlap along the length of the seam to be reconstructed and extrusion weld

3. Vacuum test the extrusion weld.

4. If either of the samples fails then additional samples are taken in accordancer with the above proceduce until passing samples are found.

5. In the case of reconstructed seams exceeding 150 feet, a sample must be taken and pass destructive testing

6. All destructive seam samples tested by Northwest Linings will be numbered and recorded on a destructive seam test form.

3. Northwest Linings Quality Assurance Laboratory Testing:

a) If destructive sample are sent to a qualified laboratory they will be tested in "Seam Strength" and "Peel Adhesion" (ASTM D 3083 and ASTM D413) as modified in NSF Standard No. 54. Five specimens shall be tested for each test method with data recorded. Four out of the five specimens must pass for each test in order for the seam to pass the destructive test.

SECTION IV Defects and Repairs

A. Inspection

1. Northwest Linings Project Superintendent shall conduct a detailed walk through and visually check all seams and non-seam areas of the geomembrane for defects, holes, blisters and signs of damage during installation.

2. All other NWL installation personnel shall at all times, be on the lookout for any damaged areas. Damaged areas shall be marked and repaired.

B. Procedure

1. Repair procedures: Any portion of the geomembrane showing a flaw, or failing destructive or non-destructive test shall be repaired. Several methods exist for repairs, and the decision as to the appropriate method shall be made by NWL's Project Superintendent. Methods available for repair:

1. Patching - used to repair large holes, tears and destructive sample locations. All patches shall extend at least six inches beyond the defect and all corners of patches shall be rounded.

2. Grinding and welding - used to repair sections of extruded seams.

3. Spot welding or seaming - used to repair small tears, pinholes or other minor localized flaws.

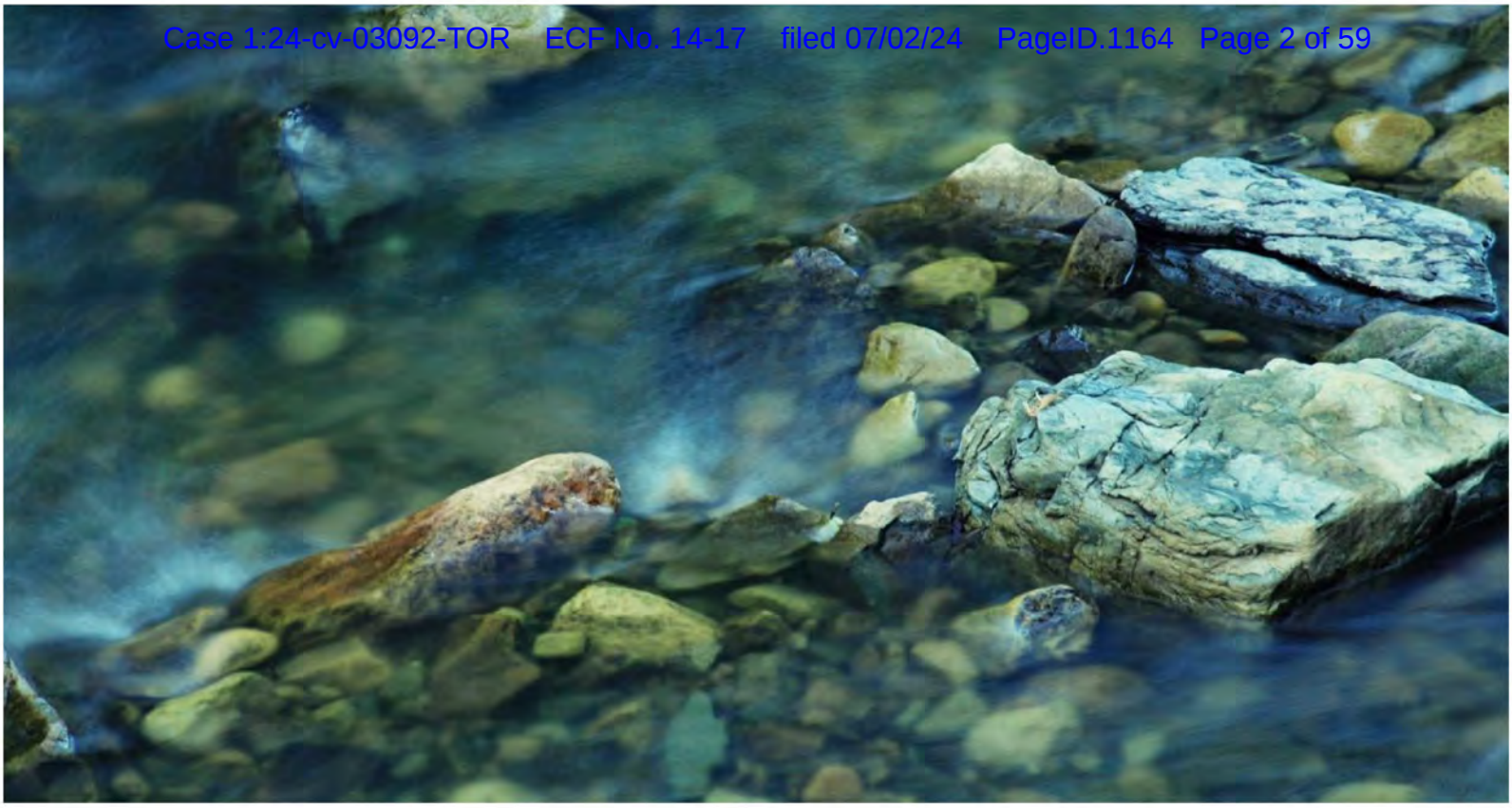
4. Capping - used to repair lengths of failed extruded areas.

5. Removal of a bad seam and replacement with a strip of new material seamed into place.

C. Verification of Repairs:

1. Every repair shall be non-destructively tested using the methods set out in this manual Repairs which pass the non-destructive test shall be deemed adequate. Large repairs may require a destructive test. Repair test results shall be logged on a repair report form. The repair location shall be recorded on a record drawing.

Eric Winiecki Declaration
Exhibit Q



March 31, 2020
Cow Palace Dairy Lagoon No. 1 and Safety Debris Catch Basin
Administrative Order on Consent Docket No. SDWA-10-2013-0080

ANCHOR QEA

Cow Palace Dairy Lagoon No. 1 and Safety Debris Catch Basin Completion Report

Prepared for Cow Palace, LLC

March 31, 2020
Cow Palace Dairy Lagoon No. 1 and Safety Debris Catch Basin
Administrative Order on Consent Docket No. SDWA-10-2013-0080

Cow Palace Dairy Lagoon No. 1 and Safety Debris Catch Basin Completion Report

Prepared for
Cow Palace, LLC
1631 North Liberty Road
Granger, Washington 98932

Prepared by
Anchor QEA, LLC
1119 Pacific Avenue, Suite 1600
Tacoma, Washington 98402

Project Number: 190996-01.01
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TABLE OF CONTENTS

1 Introduction 1

1.1 Site Description 1

2 Summary of Construction 2

2.1 Initial Preparation and Grading of Lagoon 2

2.2 Subgrade Preparation 2

2.3 Anchor Trench Excavation 3

2.4 Inlet and Outlet Piping 3

2.5 Liner System Installation 3

2.5.1 Geotextile Fabric 4

2.5.2 Geocomposite Gas Vent Strips 4

2.5.3 Flexible Membrane Liner – Drain Liner 4

2.5.4 Flexible Membrane Liner – Primary Liner 5

2.5.5 Leak Detection and Collection System 5

2.6 Barrier System 5

3 Summary 6

4 References 7

5 Certification 8

Cow Palace Dairy, LLC, Certification 8

TABLE

Table 1 Lagoon Capacities 6

FIGURE

Figure 1 Cow Palace Dairy Lagoon Map

APPENDICES

Appendix A Construction Quality Assurance Firm Report

Appendix B As-Built Drawings

ABBREVIATIONS

Contractor	Hilmes Construction, Inc.
CQA	construction quality assurance
CQA Firm	Peak GeoSolutions
CQC/CQA	construction quality control
Dairy	Cow Palace Dairy, LLC
FML	flexible membrane liner
HDPE	high-density polyethylene
mil	millimeter
oz	ounce per square yard
PVC	polyvinyl chloride
QA	quality assurance
Report	*Cow Palace Dairy Lagoon No. 1 and Safety Debris Catch Basin Completion Report*
SDCB	Safety Debris Catch Basin

1 Introduction

This *Cow Palace Dairy Lagoon No. 1 and Safety Debris Catch Basin Completion Report* (Report) was prepared by Anchor QEA, LLC, on behalf of Cow Palace Dairy, LLC (herein referred to as the "Dairy"), as required by the U.S. Environmental Protection Agency Region 10 Administrative Order on Consent SDWA-10-2013-0080. Under the Administrative Order on Consent, the Dairy was required to line Lagoon No. 1 and the Safety Debris Catch Basin (SDCB).

The purpose of this Report is to provide a detailed description of work conducted in accordance with the approved *Construction Drawings* (Anchor QEA 2019a, 2019b), *Technical Specifications* (WET 2017; Anchor QEA 2019c), *Addendum Number 1* (Anchor QEA 2019d), *Construction Quality Assurance Plan* (Anchor QEA 2019e), *Design Basis, Cow Palace, Lagoon 1* (WET 2018) and *Cow Palace Safety Debris Catch Basin Basis of Design Report* (Anchor QEA 2019f). This Report details the construction activities, discusses the final as-built conditions, and documents the results of the construction quality control/construction quality assurance (CQC/CQA) program.

1.1 Site Description

The Lagoon No. 1 and the SDCB are located at the Cow Palace Dairy (1631 North Liberty Road, Granger, Washington), south of the Dairy's main operation (Figure 1). Waste management operations at Lagoon No. 1 will include collection and storage. Lagoon No. 1 will receive liquid manure from lagoons to the north and the SDCB and store the liquid manure until it can be used to fertilize crops. The SDCB will serve as an emergency overflow basin that will be utilized in extreme precipitation events or equipment failure. A concrete sump adjacent to the SDCB will normally collect wastewater flows and will pump directly to Lagoon No. 1, bypassing the SDCB. During large precipitation events or pump failure, flows from the concrete sump will overflow to the SDCB. Wastewater collected in the SDCB will be pumped to Lagoon No. 1 for storage.

The current project included lining Lagoon No. 1 and the SDCB. A pumping system (an agitator on a floating pontoon) will be used to convey the liquid manure from the SDCB to Lagoon No. 1 and from Lagoon No. 1 to the irrigation system.

2 Summary of Construction

This section describes the construction activities undertaken to regrade and line the existing Lagoon No. 1 and the SDCB. The activities conducted as part of the lining each lagoon are listed as follows in chronological order:

- Initial lagoon preparation, excavation, and grading
- Subgrade preparation
- Anchor trench excavation
- Inlet pipe installation
- Leak detection system installation
- Liner system installation and testing

The construction was completed by Hilmes Construction, Inc., from Moses Lake, Washington (Contractor), and Northwest Linings & Geotextile Products, Inc., subcontracted to the Contractor. General construction oversight and CQA was conducted by Anchor QEA. Specialized CQA—specifically for compaction testing, subgrade compliance, and geosynthetic installation—was conducted by Peak GeoSolutions (CQA Firm), subcontracted to Anchor QEA.

2.1 Initial Preparation and Grading of Lagoon

Prior to the mobilization of the Contractor, the lagoons were taken out of service, and Dairy personnel performed liquid and solid removal activities. Liquid and solid manure was removed from the existing lagoons using standard earthmoving equipment (i.e., dozer and excavator). Manure solids were either relocated to the composting area or placed in an area that drained to another lagoon.

2.2 Subgrade Preparation

The Contractor mobilized to the site on September 23, 2019, and its work began with construction staking. Mass excavation and rough grading was then conducted to achieve the general configuration of the designed side slopes, lagoon bottom, and embankment conditions, followed by subgrade preparation. In general, the excavated soil generated through rough grading was suitable for use as on-site fill material and was used during the final grading process. A sample of the on-site fill material was collected by the CQA Firm and sent to an independent third-party material testing firm to determine moisture curves to be used during the on-site compaction testing. Results of the laboratory analysis are included in Appendix A.

During grading operations, the on-site fill material was scarified, moisture-conditioned, and compacted in 12-inch lifts using a vibratory drum roller. Compaction testing was performed on the lifts by the CQA Firm at various locations on the lagoon bottom and along the slopes to verify that fill areas were compacted to a minimum of 95% of the maximum dry density and within 2% of the

optimum moisture content as determined using the Modified Proctor (ASTM International D1557). In addition, the subgrade was proof-rolled with drum rollers to verify the subgrade was in non-yielding conditions (i.e., no evidence of "pumping"). Results of the compaction testing by Anchor QEA's third-party CQA Firm are included in Appendix A.

The final subgrade elevations are shown in the as-built drawings included in Appendix B.

2.3 Anchor Trench Excavation

Upon completion of the final subgrade grading, an anchor trench was excavated at the top of the lagoon embankment to secure the liner system. The anchor trench was located approximately 2 feet above the maximum operating level with dimensions meeting Washington State Natural Resources Conservation Service standards of between 18 and 24 inches deep, 12 and 24 inches wide, and approximately 3 feet from the top of the slope.

2.4 Inlet and Outlet Piping

All but one existing polyvinyl chloride (PVC) inlet pipe at Lagoon No. 1 and one inlet pipe at the SDCB were removed or abandoned. A new 10-inch high-density polyethylene (HDPE) inlet pipe was installed at the northern end of Lagoon No. 1, and a new 18-inch HDPE inlet pipe was installed at the eastern side of the SDCB from the concrete collection sump. Pipe connections installed to join the newly installed HDPE pipe to existing PVC pipes were joined by couplers.

The final as-built locations and inverts of the installed pipes are shown in the project as-built drawings (Appendix B).

2.5 Liner System Installation

The liner systems at Lagoon No. 1 and the SDCB were installed between November 18, 2019, and January 24, 2020, and consisted of the following components:

- Prepared subgrade
- 10-ounce-per-square-yard (oz) non-woven geotextile
- Geocomposite gas vent and HDPE cover strips
- Flexible membrane liner (FML) consisting of 50-millimeter (mil) HDPE (drain liner)
- FML consisting of 60-mil textured HDPE (primary liner)

Prior to installation of the liner system components, various quality assurance (QA) activities were conducted, including but not limited to the following:

- The material product data was reviewed by the CQA Firm to confirm compliance with the *Technical Specifications* (WET 2017).
- Manufacturer quality control testing of the manufactured rolls was reviewed.

- After the geosynthetics arrived on site, the roll numbers were checked against the shipping papers to confirm that the rolls present matched the reviewed rolls.
- Additional QA samples were cut from the delivered liners and sent to a third-party material testing firm.

Further discussion on the QA measures listed in this section, as well as results of the third-party material testing, are included in the CQA Firm's report (Appendix A).

2.5.1 Geotextile Fabric

Following subgrade preparation and testing, a 10-oz geotextile fabric was placed directly on the prepared subgrade. The geotextile serves as a cushion layer to protect the HDPE drain liner FML from the larger subgrade aggregate and improve the contact interface between the FML and the lagoon slopes.

2.5.2 Geocomposite Gas Vent Strips

For gas ventilation purposes, a network of 4-foot-wide (minimum), 200-mil geocomposite gas vent strips were placed directly on top of the 10-oz non-woven geotextile. The geocomposite gas vent strips consist of an HDPE drainage net laminated to a non-woven geotextile. The strips were installed with the non-woven geotextile facing the subgrade.

Further documentation of the gas ventilation system installation, as well as the CQA methods and tests conducted, are included as part of CQA Firm's report (Appendix A).

2.5.3 Flexible Membrane Liner – Drain Liner

Following the installation of the gas venting components, a 50-mil HDPE FML drain liner was installed using a forklift with a spreader bar attachment. The drain liner is manufactured with 130-mil studs fully integrated into the FML that promote drainage to the leak detection sump in the event of a leak in the primary liner. The drain liner was placed with the studded side up directly over the geotextile. The panels were seamed together utilizing an automated welding apparatus to conduct a double-wedge fusion weld. At the inlet pipe penetration, the Contractor encapsulated the pipe with a pipe sleeve constructed of the same material as the HDPE primary liner. Once secured, the Contractor's liner installer welded a continuous extrusion weld along the perimeter of the skirt at the location where the skirt and sleeve meet and at the location where the pipe and the sleeve meet.

Further documentation of the drain liner installation, as well as the CQA methods and tests conducted (including the results of destructive and nondestructive seam testing and documented repairs), are included as part of CQA Firm's report (Appendix A).

2.5.4 *Flexible Membrane Liner – Primary Liner*

The primary FML consists of a 60-mil textured HDPE geomembrane. The primary liner was placed with the textured side down directly over the drain liner. The panels were seamed together utilizing an automated welding apparatus to conduct a double-wedge fusion weld. At the inlet pipe penetration, the Contractor encapsulated the pipe with a second pipe sleeve constructed of the same material as the HDPE primary liner. Once secured, the Contractor's liner installer welded a continuous extrusion weld along the perimeter of the skirt at the location where the skirt and sleeve meet and at the location where the pipe and the sleeve meet.

Further documentation of the FML installation, as well as the CQA methods and tests conducted (including the results of destructive and nondestructive seam testing and documented repairs), are included as part of CQA Firm's report (Appendix A).

2.5.5 *Leak Detection and Collection System*

Any leakage passing the primary liner will be directed through the drain liner to the leak detection/collection sump located in the southwest corner of Lagoon No. 1 and the northwest corner of the SDCB. The collection sump consists of a depression in the bottom of the lagoon with washed rock and a riser conduit that houses a slope riser sump pump. The sump and pump serve as a leak detection and collection system. The pump will operate on a transducer and will pump any leachate back into the lagoon via a 1-inch HDPE discharge pipe. A flow meter attached to the discharge line collects and stores pumping times and rates to assess leakage rates.

2.6 Barrier System

Installation of a barrier system for Lagoon No. 1 and the SDCB will be performed by the Dairy and may consist of Jersey barrier blocks with a pole-and-wire system, fencing, or other barrier that will deter access to the lagoons by unauthorized personnel, vehicles, and animals.

3 Summary

Construction and lining of Lagoon No. 1 and the SDCB is complete. As shown in the as-built drawings (Appendix B), the completed Lagoon No. 1 is approximately 450 feet long (as measured north to south) and 320 feet wide (as measured from east to west), with an approximate operating level depth of 26.5 feet and an approximate freeboard of 2 feet. The completed SDCB is approximately 150 feet long (as measured north to south) and 130 feet wide (as measured from east to west), with an approximate operating level depth of 10 feet and an approximate freeboard of 2 feet.

The lagoon capacities are shown in Appendix B and Table 1.

Table 1
Lagoon Capacities

Lagoon	Operating Condition	Estimated Finished Capacity		Estimated Pre-Construction Capacity	
		Million Gallons	Acre-Feet	Million Gallons	Acre-Feet
Lagoon No. 1	Maximum	15.8	48.4	15.3	47.0
	Operational	13.8	42.4	13.4	41.0
	Impounded Volume	9.5	29.2	10.0	30.5
SDCB	Maximum	0.9	2.9	1.7	5.3
	Operational	0.7	2.2	1.3	4.0

Note:
Capacities were estimated using survey data in Autodesk Civil 3-D software.

4 References

Anchor QEA (Anchor QEA, LLC), 2019a. *Construction Drawings.* Cow Palace Lagoon No. 1. Prepared for Cow Palace Dairy, LLC. June 2019.

Anchor QEA, 2019b. *Construction Drawings.* Cow Palace Safety Debris Catch Basin. Prepared for Cow Palace Dairy, LLC. July 2019.

Anchor QEA, 2019c. *Technical Specifications.* Cow Place Safety Debris Catch Basin. Prepared for Cow Palace Dairy, LLC. June 2019.

Anchor QEA, 2019d. *Addendum Number 1.* Cow Place Lagoon No. 1. Prepared for Cow Palace Dairy, LLC. April 24, 2019.

Anchor QEA, 2019e. *Construction Quality Assurance Plan.* Prepared for Cow Palace Dairy. August 29, 2018.

Anchor QEA, 2019f. *Cow Palace Safety Debris Catch Basin Basis of Design Report.* Prepared for Cow Palace Dairy, LLC. July 15, 2019.

WET (Water & Environmental Technologies, LLC), 2017. *Technical Specifications.* Lagoon No. 2. Prepared for Cow Palace Dairy, LLC. April 11, 2017.

WET, 2018. *Design Basis, Cow Palace, Lagoon 1.* Prepared for Cow Palace Dairy, LLC. April 19, 2018.

5 Certification

Cow Palace Dairy, LLC, Certification

I certify under the penalty of law that this document and all attachments were prepared by me or under my direction or supervision in accordance with a system designed to assure that qualified personnel gathered and evaluated the information submitted. Based on my inquiry of any and all persons directly responsible for gathering and analyzing the information obtained, I certify that the information contained in or accompanying this submittal is to the best of my knowledge and belief, true, accurate, and complete. As to those identified portion(s) of this submittal for which I cannot personally verify the accuracy, I certify that this submittal and all attachments were prepared in accordance with procedures designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those directly responsible for gathering the information, or the immediate supervisor of such person(s), the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Cow Palace, LLC

Signature [signature]

Name Adam Dolsen

Title: President

Date: 3-31-20

Figure

SOURCE: Aerial from Microsoft (Bing) 5/14/2019
HORIZONTAL DATUM: Washington State Plane South Zone, North American Datum of 1983 (NAD83), U.S. Survey Feet

0 400
Feet

ANCHOR QEA

Figure 1
Cow Palace Dairy Lagoon Map
Lagoon Completion Report
Cow Palace Dairy

Appendix A
Construction Quality Assurance Firm Report

January 17, 2020

Josh Sexton, PE
Anchor QEA
1119 Pacific Ave, Suite 1600
Tacoma, Washington 98402

Subject: Cow Palace Dairy, Lagoon No. 1; Construction Quality Assurance (CQA) Letter Report – FINAL

Mr. Sexton;

This letter report documents construction and the CQA program implemented by Peak GeoSolutions (PEAKG), a third-party independent firm, in association with Lagoon No. 1 construction at the Cow Palace Dairy. Components of lagoon construction that were CQA monitored and tested by PEAKG included excavation to embankment operations, preparation of the final soil subgrade (surface), the geocomposite vent strip installations, the geotextile cushion installation, the secondary drain liner installation and the primary geomembrane installation. PEAKG also monitored construction of the secondary sump including the piping and pumping system. PEAKG provided full-time Geosynthetics Inspectors and Compacted Clay Liner Inspectors certified by the Geosynthetics Research Institute (GRI). Lagoon construction began on September 23, 2019 and was completed on December 16, 2019.

Project Documents

The following project documents provide background and support information for this letter report.

- Construction Drawings numbered 1 through 20 bearing the title; *100% Design Submittal, Cow Palace Dairy, Lagoon No. 1 Liner Project, SDWA-10-2013-0080.* Anchor QEA. August 28, 2019.
- *Cow Palace Dairy Facility, Project Specifications. Lagoon 2, Technical Specifications, AOC Docket No. SDWA-10-2013-0080.* Water & Environmental Technologies. April 17, 2017.
- *Cow Palace Dairy Facility, Lagoon No. 1 Liner Project, Addendum 1*. Anchor QEA. April 24, 2019.
- *Cow Palace Lagoon 1, Construction Inspection Plan, Administrative Order on Consent Docket No. SDWA-10-2013-0080.* Anchor QEA. August 9, 2019.

Daily CQA Reports

CQA reports were prepared and submitted daily by the CQA Monitors during construction of the lagoon. The daily reports organized and summarized all construction activities, CQA verification procedures, CQA testing, and internal quality control (QC) completed during the day. The daily reports contained the following information.

- Title-block containing the project name, project number, project location, date and summary report number.
- Description of weather conditions including low and high temperature readings, cloud cover, and precipitation.
- Summary of the day's on-going construction activities for each unit of construction. This summary included equipment, personnel, material deliveries, and subcontractors utilized for each unit of construction and identification of areas in which the construction was taking place.

- Summary of CQA verification procedures implemented during construction for each unit of construction. This summary included construction monitoring, construction verification testing, materials testing, and the Contractor's and Installer's internal QC procedures.
- Summary of project meetings or pertinent discussions including list of attendees, action items, and resolutions.
- Areas of non-conformance for substandard work and corrective action measures.
- Cross-referencing field logs, construction testing forms, laboratory testing forms, testing reports, and corrective action reports.
- Signature of CQA Monitor.

Photographic Record

The Lagoon No. 1 composite lining system was documented with a photographic record, and a series of chronological photographs are presented in Attachment A; Select Photographs.

Excavation to Embankment and Subgrade Preparation

This section describes earthwork operations performed by the general contractor, Hilmes Construction, and CQA verification procedures implemented by PEAKG for excavation to embankment operations and final subgrade preparation operations.

Native soils were excavated and embanked to the lines and grades shown on the construction drawings to form the lagoon subgrade. Excavation of soils mainly took place on the eastern half and on the floor of the lagoon. The excavated material was roughly graded into place in two main areas; 1) the western slope of the lagoon and 2) the extreme southwest corner slope of the lagoon. During the final stages of excavation to embankment operations, the design engineer provided a revised grading plan to create a soil balance for the excavation to embankment operations. Excavations and embankment materials were placed to the lines and grades shown on the revised grading plan and were compacted in accordance with the technical specifications.

To prepare the final subgrade surface for the overlying geosynthetics, the general contractor finish-graded the limits of the lagoon to the lines and grades shown on the revised grading plan. Grade was controlled by a Global Positioning System (GPS) base station with a receiver mounted on a CAT® D6N bulldozer.

To verify compliance of excavation to embankment operations and final preparation of the lagoon subgrade with the technical specifications, PEAKG performed the following CQA verification procedures:

- Performed moisture-density relation (ASTM D 1557) testing on three (3) different soil types used during embankment to establish compaction reference curves for the nuclear density-moisture testing program. All moisture-density relations (compaction reference curves) are presented in Attachment B; Lagoon Earthwork Moisture-Density-Relations.
- Performed grain size distribution and soil classification (ASTM D 422) testing on three (3) different soil types used during embankment. All grain size distribution testing is presented in Attachment C; Lagoon Earthwork Gradation and Classification.
- Performed visual examinations of embankment materials during placement operations to verify materials were free of organic, saturated, deleterious, oversized, or other unsuitable materials.
- Monitored placement, lift thickness, grading, moisture conditioning and compaction operations.
- Performed a total of twenty (20) nuclear field moisture-density tests (ASTM D6938) as placement, grading, moisture conditioning and compaction operations progressed to verify 95% relative compaction and moisture content were within 0 to 2 percent above optimum moisture content as determined by moisture-density relation testing ASTM D1557. Also, performed a total of sixteen (16) nuclear density-moisture tests to verify the completed

surface of the lagoon subgrade was compacted to a minimum of 95% relative compaction and moisture content were within 0 to 5 percent above optimum moisture content as determined by moisture-density relation testing ASTM D1557. All nuclear density-moisture tests exceeded project specifications for relative compaction and moisture content and are presented Attachment D; Lagoon Earthwork Nuclear Density-Moisture Testing Summary.

- Examined the final subgrade of the lagoon and verified the removal of all deleterious materials, large rocks and saturated materials from the completed surface and that the surface was steel drum rolled smooth. Final subgrade acceptance forms signed by the earthwork contractor, geosynthetics installer and the CQA monitor are presented in Appendix E; Subgrade Acceptance Forms.

Geotextile Cushion Installation

This section describes geotextile installations performed by the Installer and CQA verification procedures implemented by PEAKG during installation operations.

The geotextile cushion consisted of a 10-ounce polypropylene non-woven geotextile placed over the prepared soil subgrade cushioning the overlying geomembrane liner system. The geotextile was manufactured by SKAPS and was installed by Northwest Linings. Rolls were delivered to the site in 15-foot wide by 500-foot long rolls wrapped in plastic protective coverings.

Geotextile rolls were hauled into place with a JLG® extend-a-boom forklift. Panels from the rolls were then manually pulled into place over the underlying soil subgrade. Adjacent panels were overlapped a minimum of 3-inches and sewn together with a double-chain stitch polyester thread. Approximately 157,781 ft^2 geotextile was installed over the prepared soil subgrade in Lagoon 1.

Prior to geotextile installations, PEAKG performed the following CQA verification procedures:

- Reviewed all geotextile submittals required by the technical specifications. Manufacturer quality control (MQC) certifications met the product requirements of the technical specifications and are presented in Attachment F; Geotextile Manufacturer Quality Control (MQC) Testing.
- Inspected and inventoried geotextile rolls delivered to the site. Documented all roll numbers, and the receipt and review of all MQC testing reports required by the technical specifications. Verified that all rolls were stored and protected from damage and rolls were wrapped in plastic protective coverings. Geotextile inventory control logs are presented in Attachment G; Geotextile Inventory.
- Obtained two (2) geotextile conformance sample from rolls delivered to the site. TRI Laboratories subcontracted by PEAKG, tested the samples for the following physical and mechanical properties:

    1. Mass/Unit Area (ASTM D5261)
    2. Grab Strength (ASTM D4632)
    3. Trapezoidal (ASTM D 4533)

    Both geotextile samples tested met project specifications and the testing results are presented in Attachment H; Geotextile Conformance Testing.

During geotextile installations, the PEAKG performed the following CQA verification procedures:

- Examined the final subgrade of the lagoon and verified the removal of all deleterious materials, large rocks and saturated materials from the completed surface and that the surface was steel drum rolled smooth. Final subgrade acceptance forms signed by the earthwork contractor, geosynthetics installer and the CQA monitor are presented in Appendix E; Subgrade Acceptance Forms.
- Verified geotextile was installed with sufficient tension to prevent excessive overlapping, insufficient overlapping, wrinkles, and folds.
- Verified geotextile panels were overlapped with sufficient material to create a prayer fold for sewing operations.

- Verified the underlying soil subgrade was not damaged by installation equipment or methods.
- Verified rocks, excessive dust, excessive moisture or other materials that could damage, hamper sewing operations, or clog the geotextile were not entrapped under the geotextile or within the overlap.
- Verified damaged geotextile was removed entirely or repaired.
- Verified prayer fold was made within the overlap.
- Verified a continuous 401 two-thread chain stitch was used to sew the prayer fold.
- Documented geotextile installation with a photographic record.

Geocomposite Vent Strips Installation

This section describes geocomposite vent strips installation operations performed by the Installer and CQA verification procedures implemented by PEAKG during installation operations.

A network of 4-foot wide geocomposite vent strips were installed directly above the soil subgrade and directly below the GCL/geomembrane composite lining system. The geocomposite vent strips consisted of HDPE strands extruded together to form a diamond shaped drainage net with a non-woven geotextile laminated to the bottom side of the net. The geocomposite was manufactured by SKAPS and was installed by Northwest Linings. Rolls were delivered to the site in 14.5-foot wide by 300-foot long rolls wrapped in plastic protective coverings.

The geocomposite rolls were cut down to 4-foot wide vent strip panels. The vent strips were then manually rolled into place over the soil subgrades to the locations and alignments shown on the construction drawings. Vent strip panel joints were overlapped a minimum of 12-inches along the width of the strips and were tied together with plastic ties. The bottom-side of the geocomposite vent strips laminated with non-woven geotextile were installed against the underlying soil subgrade. The geocomposite vent strips penetrated through the overlying geotextile, secondary drain liner and primary geomembrane composite lining system along the crest and around the perimeter of the lagoon at twenty-six (26) locations with 2-inch diameter vent holes covered with square cap-patches (rain-flaps) extrusion welded on three sides.

Prior to geocomposite vent strip installations, PEAKG performed the following CQA verification procedures:

- Reviewed all geocomposite submittals required by the technical specifications. Manufacturer quality control (MQC) certifications met the product requirements of the technical specifications and are presented in Attachment I; Geocomposite Manufacturer Quality Control (MQC) Testing.
- Inspected and inventoried geocomposite rolls delivered to the site. Documented all roll numbers, and the receipt and review of all MQC testing reports required by the technical specifications. Verified that all geocomposite rolls were stored and protected from damage and moisture intrusion. Geocomposite inventory control logs are presented in Attachment J; Geocomposite Inventory.
- Obtained one (1) geocomposite conformance sample from rolls delivered to the site. TRI Laboratories subcontracted by PEAKG, tested the sample for the following physical and mechanical properties:

    1. Transmissivity (ASTM D4716)
    2. Thickness (ASTM D5199)
    3. Density (ASTM D1505)
    4. Carbon Black Content (ASTM D1603)
    5. Tensile Properties (ASTM D7179)
    6. Mass/Unit Area (ASTM D5261)
    7. Grab Strength (ASTM D4632)

    The sample tested met project specifications and testing results are presented in Attachment K; Geocomposite Conformance Testing.

During geocomposite vent strip installations, the on-site CQA Monitor performed the following CQA verification procedures:

- Verified the underlying soil subgrade was complete and acceptable for geosynthetics installations.
- Verified geocomposite vent strips were installed over the soil subgrade to the locations and alignments shown on the construction drawings.
- Verified geocomposite vent strip panels were placed with sufficient tension to prevent excessive overlapping, insufficient overlapping, wrinkles, and folds.
- Verified geocomposite vent strip panels were overlapped a minimum of 12-inches and overlaps were connected together with plastic cable ties.
- Verified underlying soil subgrade was not damaged by installation equipment or methods.
- Verified the removal and replacement of damaged and/or clogged geocomposite vent strip panels.
- Documented geocomposite vent strips installation with a photographic record.

Primary and Secondary Geomembrane Installations

This section describes geomembrane installations performed by the Installer and CQA verification procedures implemented by PEAKG during installation operations.

Lagoon 1 is a double-lined containment consisting of a secondary geomembrane and a primary geomembrane. Geomembrane used for the primary liner system consisted of a single-sided textured (micro-spiked) high-density polyethylene (HDPE) liner. The primary geomembrane has a nominal sheet thickness of 60-mils and was delivered to the site in 23-foot wide by 530-foot long rolls. Geomembrane used for the secondary liner system consisted of HDPE drain liner with drainage-knobs on the topside at heights of 250-mils, and a smooth bottom side. The secondary geomembrane has a nominal sheet thickness of 50-mils and was delivered to the site in 23-foot wide by 500-foot long rolls. Both geomembrane products for were manufactured by Agru-America and were installed by Northwest Linings.

The same deployment and installation techniques were used by the Installer for both the secondary drain liner installation and for the overlying primary geomembrane installation. Geomembrane rolls were hauled into place and deployed with a spreader bar mounted on a large JLG® G1055A extend-a-boom forklift or a large Case® 210B excavator. Geomembrane panels were pulled out manually either over the underlying geotextile cushion or secondary drain liner installation. Adjacent panels were overlapped a minimum of 4-inches and fusion welded together using double-track welding machines. Approximately 155,512 ft^2 of primary geomembrane and approximately 157,781 ft^2 of secondary drain liner geomembrane were installed in Lagoon 1. Separate as-built panel layout drawings for the primary and secondary geomembrane installations Lagoon 1 are presented in Attachment L; Primary and Secondary Geomembrane Panel Layout Drawings.

Prior to geomembrane installations the PEAKG performed the following construction quality assurance verification procedures:

- Reviewed geomembrane submittals required by the technical specifications. Manufacturer quality control (MQC) certifications required by the technical specifications are presented in Attachment M; Primary and Secondary Geomembrane Manufacturer Quality Control Testing.
- Obtained two (2) conformance samples from the primary geomembrane rolls and two (2) conformance samples from the secondary geomembrane rolls delivered to the site. TRI Laboratories, subcontracted by PEAKG, tested the samples for the following physical and mechanical properties:
    1. Tensile Properties (ASTM D 638)
    2. Density (ASTM D 1505)
    3. Carbon Black Content (ASTM D 1603)

4. Carbon Black Dispersion (ASTM D 3015)
5. Sheet Thickness (ASTM D 5199)

All primary and secondary geomembrane conformance samples tested met project specifications and the testing results are presented in Attachment N; Primary and Secondary Geomembrane Conformance Testing.

- Inspected and inventoried primary and secondary geomembrane rolls delivered to the site. Documented all geomembrane roll numbers, and the receipt and approval of all manufacturer's quality control (MQC) testing reports required by the technical specifications. Geomembrane inventory control logs are presented in Attachment O; Primary and Secondary Geomembrane Inventory.

During geomembrane deployment operations, the on-site CQA Monitor performed the following CQA verification procedures:

- Verified the underlying geotextile and secondary drain liner installations were complete and acceptable for the overlying geomembrane installations.
- Verified anchor trenches were excavated to the dimensional cross-sections shown on the construction drawings.
- Monitored geomembrane deployment operations. Verified areas of acceptance, geomembrane roll numbers, panel numbers, panel dimensions, and panel areas. Field sketched daily panel layout drawings. Deployment operations were logged and are presented in Attachment P; Primary and Secondary Geomembrane Panel Placement.
- Verified panels were overlapped a minimum of 4 inches as required by the fusion welding machines. Verified alignment of the overlap was consistent and that overlap indicator points were marked approximately every 20-feet along the entire length of the panels.
- Verified geomembrane was not damaged during handling, transport, or deployment operations. Verified damaged geomembrane was repaired or removed entirely.
- Verified the underlying geotextile and secondary drain liner installations were not damaged. Verified damaged underlying layers were completely repaired.
- Verified excessive wrinkling of the geomembranes did not occur and that compensation for stress bridging was added during deployment operations. Verified that excessive wrinkles and stress bridging were repaired or removed entirely.
- Documented geomembrane installations and CQA activities with a photographic record.

During geomembrane welding operations, the on-site CQA Monitor performed the following CQA verification procedures:

- Monitored, documented, and verified each fusion welding machine and extrusion welding gun completed daily trial welds and met the criteria for peel adhesion and bonded seam testing in accordance with the technical specifications. Daily trial weld results are presented in Attachment Q; Primary and Secondary Geomembrane Trial Welds.
- Monitored and documented geomembrane welding operations. Recorded ambient and geomembrane temperatures, trial weld testing data, geomembrane seam numbers, welding operators, welding machine and gun numbers, and seam lengths. Welding operations were logged and are presented in Attachment R; Primary and Secondary Geomembrane Seaming Control Logs.
- Verified welding surfaces were thoroughly cleaned prior to and continually cleaned during welding operations.
- On fusion welded seams, verified seams were welded at the same speed, temperature, roller pressure, and gauge settings used to prepare the trial welds. Verified welding operators recorded welding machine numbers, operators, machine settings, times, and dates on each seam welded.

- On fusion welded seams, closely observed each fusion welding machine to verify machines were not adversely affecting or damaging the parent geomembrane material outside the welding area.
- Verified repair patches were cut square with rounded corners and were large enough to extend a minimum of 4-inches in all directions over repair areas.
- Verified geomembrane and repair patches were tack-welded in place to prevent movement during grinding and extrusion welding operations.
- Verified the outer edge of repair patches and the adjacent underlying geomembrane were disc-ground to remove surface debris and oxidation. Verified grinding was not parallel to seam.
- Verified that the nozzles of extrusion guns were purged to remove solidified extrudate.
- Verified extrusion welds completely covered the entire width of the grind area and that extrusion safety welds extended 4-inches up the intersecting fusion welded seam.
- Verified extrusion weld repair (safety) patches were welded over all fusion welded seam intersections.
- Obtained geomembrane seam samples for every 500 linear feet of welded seam. Duplication testing was performed on each seam sample collected. TRI Laboratories, subcontracted by PEAKG, performed bonded seam strength and peel adhesion testing in accordance with ASTM D 6392. The Installer also performed bonded seam strength and peel adhesion testing on site under the observation of the CQA Monitor. Bonded seam strength and peel adhesion testing criteria specified in the technical specifications was the basis for passing or failing each test specimen. A total of fourteen (14) samples were obtained from the secondary drain liner geomembrane installation and a total of fifteen (15) samples were obtained from the primary geomembrane installation. All twenty-nine (29) samples tested met project specifications for peel adhesion and bonded seam strength testing. Quality Control (QC) seam testing results performed by the Installer are presented in Attachment S; QC Primary and Secondary Geomembrane Destructive Seam Testing and CQA seam testing results performed by TRI Laboratories are presented in Attachment T; Primary and Secondary Geomembrane CQA Seam Analysis.

During air pressure testing of fusion welded seams, performed by the Installer, the on-site CQA Monitor performed the following CQA verification procedures:

- Verified the air pump was capable of generating and maintaining 60-psi of pressure and was equipped with a regulator and pressure gauge. Pressure-feed needles were equipped with pressure gauges accurate to 1 psi.
- Verified both ends of the fusion-welded seam were sealed by heat fusion. The air pressure needle was inserted into the fusion weld channel at one end of the seam.
- Verified the channel was pressurized to 30-psi and pressure was maintained for 5 minutes.
- Verified the air was released from the opposite end of the seam to verify the entire length of the fusion weld channel was pressurized. If channel did not maintain pressure with a maximum allowable pressure loss of 2 psi over the 5-minute test period or did not stabilize at all, the CQA Engineer verified the defective area was located and isolated, and that air pressure test procedures were repeated in both directions away from the defective area. Air pressure testing operations were logged and are presented in Attachment U; Primary and Secondary Geomembrane Air Pressure Testing Logs.

During vacuum testing of extrusion welded seams and repairs, performed by the Installer, the on-site CQA Monitor performed the following CQA verification procedures:

- Verified vacuum pumps can generate and maintain 30-inches of mercury and were equipped with a regulator and vacuum gauge. Vacuum boxes had clean view windows and vacuum gauges were accurate to 1 psi.
- Verified extrusion welds were saturated with a soap/water solution.
- Verified the view-box was placed over the saturated weld, an airtight seal was created, and vacuum was applied to the weld.

- Verified vacuum was maintained for a minimum of 5 seconds and the weld was examined for leaks. Leaks are detected by the presence of excessive bubbles. Detected leaks were marked for follow up extrusion welding repair. Detected leaks were re-vacuum tested after repair operations to verify that the leaks were successfully repaired.

The on-site CQA Monitor verified all geomembrane repairs were completed and tested by assigning each repair a number, documenting the location of the repair, documenting the repair date, and recording vacuum testing dates and results. Repairs and vacuum testing operations were logged and are presented in Attachment V; Primary and Secondary Geomembrane Repair Logs.

Wind-Blown Secondary Liner Event

On November 28, 2019 and over the Thanksgiving break, the completely installed secondary liner was blown out of place and damaged by high winds. The wind-blown liner was restored and repaired over the next eight (8) days between November 29 and December 6, 2019. A series of photographs showing the results of the wind-blown event and operations to restore the secondary liner installation are presented in Attachment A; Select Photographs. Efforts to restore the secondary liner were monitored by PEAKG and documented in Daily CQA Reports, and executed repairs are verified on standard Repair Logs presented in Attachment V; Primary and Secondary Repair Logs. The restored secondary liner installation was re-examined, re-inspected and cleared for the overlying primary geomembrane installation on December 6, 2019.

Geosynthetics Installer's Quality Control

Northwest Linings, the Geosynthetics Installer, performed their own internal quality control (QC) program to support their Installation Warranty provided to the Owner. QC documentation provided by the Installer is presented in Attachment W; Geosynthetics Installer's Quality Control (QC).

Statement of Compliance

The CQA program described in this letter report was performed by Peak GeoSolutions in compliance with the *Cow Palace Lagoon 1, Construction Inspection Plan, Administrative Order on Consent Docket No. SDWA-10-2013-0080* prepared by Anchor QEA, and under the direction of Josh Sexton, PE a registered engineer in the State of Washington. Based on full-time CQA monitoring and documentation during construction and materials testing results it is the opinion of the undersigned that the Lagoon No.1 composite lining system at the Cow Palace Dairy was constructed in a good workman-like manner, in accordance with standard trade practices, in substantial compliance with the technical specifications and the construction drawings, and in accordance with the design intent.

J. Stein

John Stein, GCI-ICP
CQA Manager
Peak GeoSolutions

ATTACHMENTS

Attachment A; Select Photographs

Attachment B; Lagoon Earthwork Moisture-Density-Relation

Attachment C; Lagoon Earthwork Sieve Gradation and Classification

Attachment D; Lagoon Earthwork Nuclear Density-Moisture Testing Summary

Attachment E; Subgrade Acceptance Forms

Attachment F; Geotextile Manufacturer Quality Control (MQC) Testing

Attachment G; Geotextile Inventory

Attachment H; Geotextile Conformance Testing

Attachment I; Geocomposite Manufacturer Quality Control (MQC) Testing

Attachment J; Geocomposite Inventory

Attachment K; Geocomposite Conformance Testing

Attachment L; Primary and Secondary Geomembrane Panel Layout Drawings

Attachment M; Primary and Secondary Geomembrane Manufacturer Quality Control (MQC) Testing

Attachment N; Primary and Secondary Geomembrane Inventory

Attachment O; Primary and Secondary Geomembrane Conformance Testing

Attachment P; Primary and Secondary Geomembrane Panel Placement

Attachment Q; Primary and Secondary Geomembrane Trial Welds

Attachment R; Geomembrane Seaming Control Logs

Attachment S; Primary and Secondary Geomembrane QC Destructive Seam Testing

Attachment T; Primary and Secondary Geomembrane CQA Seam Analysis

Attachment U; Primary and Secondary Geomembrane Air Pressure Testing Logs

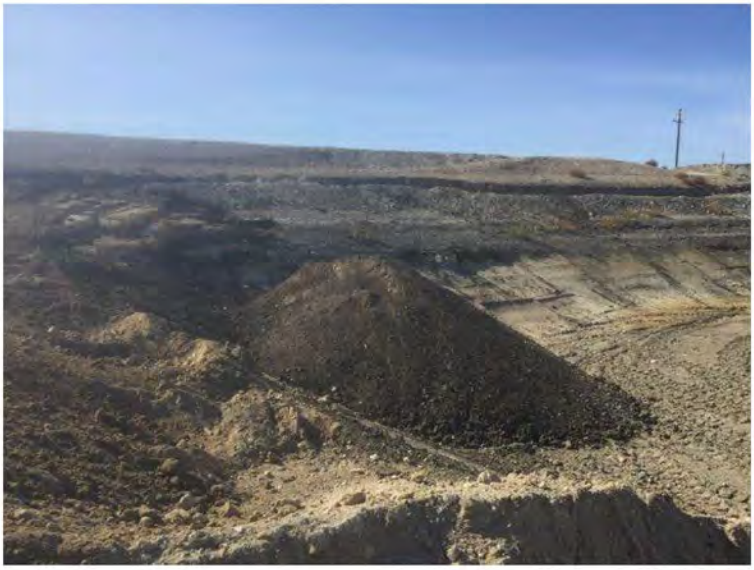
Attachment V; Primary and Secondary Geomembrane Repair Logs

Attachment W; Geosynthetics Installer's Quality Control (QC)

Attachment A

Select Photographs

Initial rough grading on the east exterior slope in Lagoon No. 1 at Cow Palace.
September 25, 2019 at 10:39:47 AM



Additional manure removal in the southeast corner slope in Lagoon No. 1 at Cow Palace.
September 25, 2019 at 11:01:58 AM

TDG8 dozer at Cow Palace with slope-blade.
September 26, 2019 at 9:45:45 AM

GPS guided D6N dozer at Cow Palace.
September 26, 2019 at 9:46:38 AM

Additional manure removal operation from interior of Lagoon No. 1.
September 26, 2019 at 10:10:02 AM

GPS guided dozer begining rough grading operations along the east crest of Lagoon No. 1.
September 27, 2019 at 12:00:48 PM

GPS guided dozer begining rough grading operations along the east crest of Lagoon No. 1.
September 27, 2019 at 12:01:20 PM

GPS guided dozer begining rough grading operations along the east crest of Lagoon No. 1.
September 27, 2019 at 12:01:42 PM

Rough grading and soil balancing operations on the north end of Lagoon 1.
September 30, 2019 at 2:47:06 PM

Rough grading and soil balancing operations on the north end of Lagoon 1.
September 30, 2019 at 2:48:09 PM

Rough grading and soil balancing operations on the interior north slope of Lagoon 1.
October 1, 2019 at 1:04:17 PM

Rough grading and soil balancing operations on the interior north slope of Lagoon 1.
October 1, 2019 at 1:06:44 PM

Rough grading and soil balancing operations on the interior north slope and floor of Lagoon 1.
October 1, 2019 at 1:09:02 PM

Rough grading and soil balancing operations on the interior north slope and floor of Lagoon 1.
October 1, 2019 at 1:09:05 PM

Rough grading and soil balancing operations on the interior north floor of Lagoon 1.
October 1, 2019 at 1:11:57 PM

Rough grading and soil balancing operations on the north floor of the lagoon.
October 2, 2019 at 10:47:42 AM

Fine grading operations on the east cut-slope.
October 3, 2019 at 1:15:22 PM

Begining embankment operations in southeast corner and along the east toe of the lagoon.
October 4, 2019 at 8:33:47 AM

Fine grading on the crest of the east slope.
October 4, 2019 at 8:40:02 AM

Ripping the floor of the lagoon.
October 4, 2019 at 11:20:55 AM

Existing power pole, panel, concrete pad and piping for removal at the crest of the southwest corner slope.
October 4, 2019 at 11:44:30 AM

Lift placement and grading operations in the heavy fill area in the southwest corner slope.
October 8, 2019 at 8:56:19 AM

Lift placement and grading operations in the heavy fill area in the southwest corner slope.
October 8, 2019 at 8:58:55 AM

Compaction operations in the heavy fill area in the southwest corner slope.
October 8, 2019 at 9:22:46 AM

Nuclear density-moisture testing in the heavy fill area in the southwest corner slope verifying relative compaction.

October 8, 2019 at 9:46:44 AM

Nuclear density-moisture testing in the heavy fill area in the southwest corner slope verifying relative compaction.

October 8, 2019 at 9:46:51 AM

Embankment operations in the heavy fill area in the southwest corner slope.

October 8, 2019 at 10:40:01 AM

Compaction operations in the heavy fill area in the southwest corner slope.

October 8, 2019 at 10:48:38 AM

Ripping the floor of the lagoon.
October 8, 2019 at 11:33:59 AM

Ripping the floor of the lagoon.
October 8, 2019 at 11:34:04 AM

Compaction operations in the heavy fill area in the southwest corner slope.
October 8, 2019 at 12:38:38 PM

Nuclear density-moisture testing in the heavy fill area in the southwest corner slope verifying relative compaction.
October 8, 2019 at 12:47:41 PM

Nuclear density-moisture testing in the heavy fill area in the southwest corner slope verifying relative compaction.

October 8, 2019 at 2:57:49 PM

Lift placement and grading operations in the heavy fill area in the southwest corner slope.

October 8, 2019 at 3:38:36 PM

Lift placement and grading operations in the heavy fill area in the southwest corner slope.

October 8, 2019 at 3:41:55 PM

Embankment operations in the heavy fill area in the southwest corner slope.

October 9, 2019 at 8:22:51 AM

Compaction operations in the heavy fill area in the southwest corner slope.
October 9, 2019 at 8:32:25 AM

Nuclear density-moisture testing in the heavy fill area in the southwest corner slope verifying relative compaction.
October 9, 2019 at 10:00:01 AM

Embankment operations in the heavy fill area in the southwest corner slope.
October 9, 2019 at 12:22:37 PM

Compaction operations in the heavy fill area along the west slope.
October 9, 2019 at 12:28:08 PM

Compaction on the final horizontal embankment (6-feet vertical) on the west slope.
October 10, 2019 at 12:35:37 PM

Compaction on the final horizontal embankment (6-feet vertical) on the west slope.
October 10, 2019 at 12:36:00 PM

Nuclear density-moistue testing on the final horizontal embankment (6-feet vertical) on the west slope.
October 10, 2019 at 12:53:28 PM

End of day earthwork progress in the lagoon on 10/10.
October 10, 2019 at 1:26:22 PM

End of day earthwork progress in the lagoon on 10/10.
October 10, 2019 at 1:27:11 PM

End of day earthwork progress in the lagoon on 10/10.
October 10, 2019 at 1:27:18 PM

End of day earthwork progress in the lagoon on 10/10.
October 10, 2019 at 1:28:17 PM

End of day earthwork progress in the lagoon on 10/10.
October 10, 2019 at 1:28:38 PM

Drain liner and micro-spike geomembrane deliveries at Cow Palace Dairy.
October 23, 2019 at 3:07:05 PM

Drain liner geomembrane delivery at Cow Palace Dairy.
October 23, 2019 at 3:14:22 PM

Drain liner geomembrane delivery at Cow Palace Dairy.
October 23, 2019 at 3:14:44 PM

Micro-spike geomembrane delivery at Cow Palace Dairy.
October 23, 2019 at 3:15:01 PM

Micro-spike and drain liner geomembrane conformance sampling at Cow Palace Dairy.
October 24, 2019 at 11:16:17 AM

Excavation operations on the lagoon floor at Cow Palace.
October 24, 2019 at 11:22:08 AM

Over excavation on the lagoon floor and re-grading the west slope to revised subgrade.
October 29, 2019 at 1:50:59 PM

Over excavation on the lagoon floor and re-grading the west slope to revised subgrade.
October 29, 2019 at 1:53:17 PM

Over excavation on the lagoon floor and re-grading the west slope to revised subgrade.
October 30, 2019 at 9:29:07 AM

Over excavation on the lagoon floor and re-grading the west slope to revised subgrade.
October 30, 2019 at 9:30:18 AM

Nuclear density-moisture testing on the final subgrade on the west slope.
October 30, 2019 at 10:03:02 AM

Steel-drum rolling the final subgrade on the west slope.
October 30, 2019 at 10:18:46 AM

Nuclear density-moisture testing on the final subgrade on the east cut slope.
October 30, 2019 at 10:28:01 AM

Final grading and compaction operations on the southeast slope.
October 30, 2019 at 10:28:10 AM

Final grading and compaction operations on the southeast corner slope.
October 30, 2019 at 11:23:18 AM

Final grading and compaction operations on the southeast corner slope.
October 30, 2019 at 1:00:10 PM

Final graging operations in the interior of the lagoon.
October 31, 2019 at 8:57:08 AM

Completed Lagoon 1 subgrade at Cow Palace.
November 7, 2019 at 4:20:15 PM

Completed Lagoon 1 subgrade at Cow Palace.
November 7, 2019 at 4:25:19 PM

Completed Lagoon 1 subgrade at Cow Palace.
November 8, 2019 at 8:44:54 AM

Completed Lagoon 1 subgrade at Cow Palace.
November 8, 2019 at 8:49:16 AM

Completed Lagoon 1 subgrade at Cow Palace.
November 8, 2019 at 8:49:32 AM

Sump area rough graded out in the southwest corner of Lagoon 1
November 8, 2019 at 8:50:36 AM

Sump area rough graded out and riser pipe trench in the southwest corner of Lagoon 1
November 8, 2019 at 8:51:32 AM

IMG_144146.JPG
Geotextile installation over subgrade in the sump and riser pipe trench.
November 18, 2019 at 14:41:46 PM

IMG_150633.JPG
50-mil HDPE drain liner installation in the subgrade and riser pipe trench/
November 18, 2019 at 15:06:33 PM

IMG_112315.JPG
Re-rolling the subgrade on the west slope and floor of Lagoon 1.
November 18, 2019 at 11:23:15 AM

IMG_161429.JPG
Moved HDPE riser pipe into place and began placing 1 ½" aggregate in the sump.
November 19, 2019 at 16:14:29 PM

IMG_090958.JPG
Began anchor trench excavation.
November 20, 2019 at 09:09:58 AM

IMG_091338.JPG
Covered drain aggregate in the sump with 10oz separating geotextile.
September 20, 2019 at 09:13:38 AM

IMG_080338.JPG
Installing 8-inch HDPE Inlet pipe in the north slope of Lagoon 1.
November 21, 2019 at 08:03:38 AM

IMG_111531.JPG
Finished 8-inch HDPE inlet pipe installation.
November 21, 2019 at 11:15:31 AM

IMG_135431.JPG
Continued 10oz geotextile installation, prayer sewing all seams.
November 21, 2019 at 13:54:31 PM

IMG_153718.JPG
Filled subgrade voids and rough areas with sand prior to geotextile installation.
November 21, 2019 at 15:37:18 PM

IMG_155535.JPG
End of day progress of 10oz geotextile installation in the northern-third of Lagoon 1.
November 21, 2019 at 15:55:35 PM

IMG_104442.JPG
Approved subgrade to finish 10oz geotextile installation.
September 23, 2019 at 10:44:42 AM

Geotextile seaming (sewing) operations.
November 22, 2019 at 2:19:41 PM

Geotextile installation operations over the completed soil subgrade.
November 22, 2019 at 12:32:22 PM

Geotextile installation operations over the completed soil subgrade.
November 22, 2019 at 2:18:53 PM

Geotextile installation operations over the completed soil subgrade.
November 22, 2019 at 2:18:46 PM

IMG_155535.JPG
Composite vent strip installation over installed 10oz geotextile.
November 23, 2019 at 13:13:11 PM

IMG_163519.JPG
Installed ±41,584 ft^2 of 50-mil drain liner in the southern-third of Lagoon 1.
November 23, 2019 at 16:35:19 PM

IMG_150846.JPG
Installed ±65,544 ft^2 of 50-mil drain liner in the middle-third of Lagoon 1 today.
November 24, 2019 at 15:08:46 PM

IMG_112031.JPG
Marked destructive seam sampled at 500-foot intervals.
November 26, 2019 at 11:20:31 AM

IMG_082510.JPG
50-mil liner blowout at north end of Lagoon 1
November 29, 2019 at 08:25:10 AM

IMG_101010.JPG
50-mil liner blowout at southern half of Lagoon 1.
November 29, 2019 at 10:10:10 AM

IMG_101110.JPG
50-mil liner blowout at north end of Lagoon 1.
November 29, 2019 at 10:11:10 AM

IMG_120512.JPG
50-mil blowout at south end of Lagoon 1 (looking west).
November 29, 2019 at 12:05:12 PM

IMG_133202.JPG
Close up of 50-mil blowout at south end of Lagoon 1.
November 29, 2019 at 13:32:02 PM

IMG_133945.JPG
NWL is cutting liner at corner and pulling it back into place on the floor and slopes of Lagoon 1.
November 29, 2019 at 13:39:45 PM

IMG_134122.JPG
Pulling 50-mil drain liner back up the slopes using man power and a PX210B excavator and JLG Tele-Handler.
November 29, 2019 at 13:41:22 PM

IMG_141612.JPG
Finished pulling 50-mil drain liner back into place at the north end of Lagoon 1.
November 29, 2019 at 1:16:12 PM

IMG_155848.JPG
Re-installed vent strips along the slopes and floor.
November 29, 2019 at 15:58:48 PM

IMG_155940.JPG
Placed 60-mil geomembrane in anchor trenches and sandbags along edges at the end of the day.
November 29, 2019 at 15:59:40 PM

IMG_091142.JPG
Began and finished pulling 50-mil drain liner back into place in the south half of Lagoon 1.
November 30, 2019 at 09:11:42 AM

IMG_082341.JPG
Snow fall in Lagoon 1 accumulated ±1-2" throughout the day.
December 01, 2019 at 08:23:41 AM

IMG_100350.JPG
No work today on geomembrane installation due to snowfall overnight and throughout the day.
December 01, 2019 at 10:03:50 AM

IMG_075815.JPG
Large wrinkles from 50-mil drain liner blowout.
December 02, 2019 at 07:58:15 AM

IMG_105811.JPG
50-mil drain liner ripped east to west across the floor and slopes of Lagoon 1.
December 02, 2019 at 10:58:11 AM

IMG_110630.JPG
Extrusion welding cuts made to reposition 50-mil drain liner in the northeast corner.
December 02, 2019 at 11:06:30 AM

IMG_141230.JPG
Large wrinkles in Lagoon 1 will be pulled flat or cut out and repaired.
December 02, 2019 at 14:12:30 PM

IMG_142643.JPG
NWL is repairing all tears along the anchor trench.
December 02, 2019 at 14:26:43 PM

IMG_153729.JPG
Repairing tears and wrinkles in Lagoon 1.
December 02, 2019 at 15:37:29 PM

IMG_114326.JPG
Large wrinkles in Lagoon 1 that will be pulled flat or cut out.
December 03, 2019 at 11:43:26 AM

IMG_144246.JPG
Extrusion welding a large cut that was made to pull wrinkles out.
December 04, 2019 at 14:42:46 PM

IMG_155503.JPG
Southeast corner of Lagoon 1 floor and slopes after repairs and wrinkle removal.
December 04, 2019 at 15:55:03 PM

IMG_090632.JPG
North end of Lagoon 1 and repairs and wrinkle removal.
December 05, 2019 at 09:06:32 AM

IMG_090640.JPG
Southeast corner of Lagoon 1 after repairs.
December 05, 2019 at 09:06:40 AM

IMG_090913.JPG
North slope and floor of Lagoon 1 after repairs.
December 05, 2019 at 09:09:13 AM

IMG_091253.JPG
Lagoon 1 50-mil drain liner after repairs (looking west).
December 05, 2019 at 09:12:53 AM

IMG_161620.JPG
60-mil HDPE geomembrane installation on the north slope of Lagoon 1..
December 06, 2019 at 16:16:20 PM

IMG_075904.JPG
Overnight rain water collection in the sump over the 50 mil drain liner.
December 09, 2019 at 07:59:04 AM

IMG_093936.JPG
Hilmes Construction on-site this morning to pump out standing water in the sump.
December 09, 2019 at 09:39:36 AM

IMG_074359.JPG
Continued 60-mil primary liner installation in the middle-third of Lagoon 1.
December 10, 2019 at 07:43:59 AM

IMG_122103.JPG
Continued 60-mil primary liner installation in the middle-third of Lagoon 1.
December 10, 2019 at 12:21:03 PM

IMG_161114.JPG
End of day progress of 60-mil primary geomembrane installation in Lagoon 1.
December 10, 2019 at 16:11:04 PM

IMG_073245.JPG
Standing water in sump at the southwest corner of Lagoon 1 was pumped out in the morning.
December 11, 2019 at 07:32:45 PM

IMG_073908.JPG
Using dozer and skid steer in tandem to pull liner into place up the east slope of Lagoon 1 .
December 11, 2019 at 07:39:08 AM

IMG_110518.JPG
Continued 60-mil primary geomembrane installation in Lagoon 1.
December 11, 2019 at 11:05:18 AM

IMG_073707.JPG
Frosty conditions over the liner delayed installation operations this morning.
December 13, 2019 at 08:37:07 AM

IMG_084156.JPG
Frost covered the 60-mil primary geomembrane in the morning.
December 14, 2019 at 08:41:56 AM

IMG_163204.JPG
Completed 60-mil primary geomembrane installation in Lagoon 1. (repairs and rub-sheets remain).
December 13, 2019 at 16:32:04 PM

IMG_092120.JPG
Began batten bar work over the concrete spillway at the top of the south slope.
December 14, 2019 at 09:21:20 AM

IMG_134455.JPG
Cut 2" vent holes and installed 12"x12" rain flaps at 26 locations around the crest of Lagoon 1.
December 15, 2019 at 13:44:55 PM

IMG_154541.JPG
Began installing double layered rub sheet on the south end of the west slope.
December 15, 2019 at 15:45:41 PM

IMG_100501.JPG
Backfilled anchor trench on the north end of Lagoon 1.
December 17, 2019 at 10:05:01 AM

IMG_101352.JPG
Backfilled anchor trench along the east end of Lagoon 1.
December 17, 2019 at 10:13:52 AM

IMG_103412.JPG
Backfilled anchor trench along the south end of Lagoon 1.
December 17, 2019 at 10:34:12 AM

IMG_113306.JPG
Backfilled anchor trench along the west end of Lagoon1.
December 17, 2019 at 11:33:06 AM

IMG_101922.JPG
Vacuum testing all extrusion welded repairs in Lagoon 1.
December 17, 2019 at 10:19:22 AM

IMG_104245.JPG
Installed boot and skirt over the 18-inch riser pipe and into the anchor trench.
December 17, 2019 at 10:42:45 AM

IMG_115701.JPG
Overview of completed Lagoon 1 (taken from southwest corner).
December 17, 2019 at 11:57:01 AM

IMG_120126.JPG
Overview of completed Lagoon 1 (taken from southeast corner).
December 17, 2019 at 12:01:26 PM

IMG_120338.JPG
Overview of completed Lagoon 1 (taken from northeast corner).
December 17, 2019 at 12:03:38 PM

IMG_120504.JPG
Overview of completed Lagoon 1 (taken from northwest corner).
December 17, 2019 at 12:05:04 PM

IMG_093520.JPG
Located and marked fifteen (15) destructive seam samples and 500-foot intervals.
December 14, 2019 at 09:12:53 AM

IMG_144227.JPG
Completed batten bar of the 50-mil drain liner on the concrete spillway at the top of the south slope.
December 14, 2019 at 14:42:27 PM

IMG_090718.JPG
Continued smooth drum rolling the perimeter anchor trench around Lagoon 1.
January 13, 2020 at 09:07:18 AM

PEAK GEOSOLUTIONS

Repair Report

Reported By: R. Kernan INSTALLER: Northwest Linings Job # : 2019.10

Project Name: Cow Palace Lagoon 1 Closure [ ] Pad [ ]

Material Type: 50-mil HDPE Drain Liner Pond [X] Other Granger, Washington

Job Description: Lagoon 1

Damage Codes

CR – Crease; DS – Destructive Sample; SI – Subgrade Irregularity; SJ –Seam Joint; FS –Failed Seam; WR –Wrinkle; AV –Airvent; AO –Add On; MatD –Material Defect; WS –Welder Restart; RW –Roller Wrinkle; FM –Fishmouth; LL –Lost Lap; MD –Mechanical Damage; DO –Damage By Others; AT –Air test; BO –Burn Out; PB –Pipe Boot; CF –Custom fit; WD –Wind Damage

SF Patch Material

LF Welded

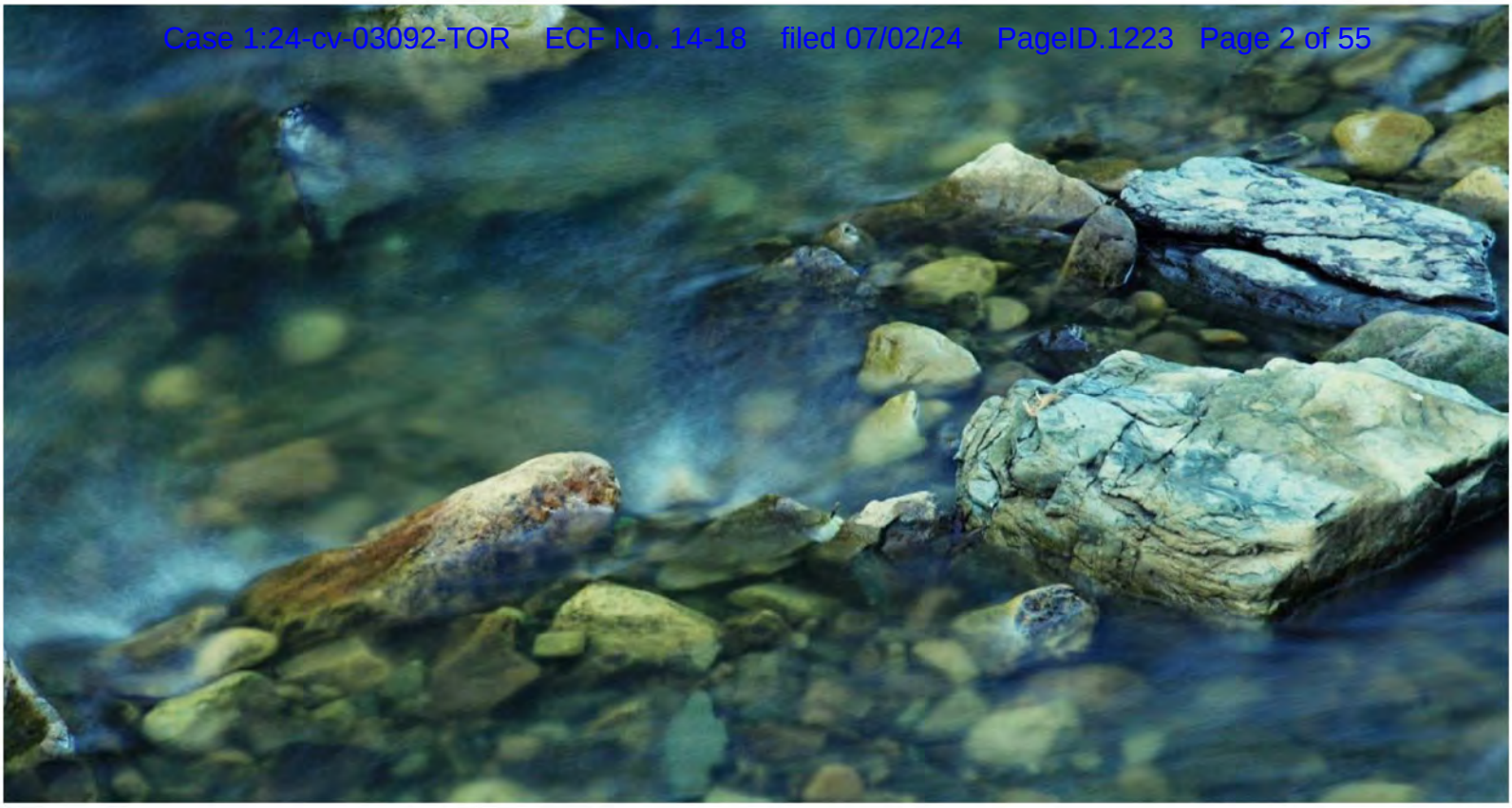
Test Type: VAC=Vacuum; AP=Air Pressure; SP=Spark; AL=Air Lance

Abbrv.: S=South; N=North; W=West; E=East

Repair Types: C--Cap Strip; P--Patch; B--Extrusion Bead

Repair Number	Damage Code	Seam Number	Panel Number	Location	Repair Type	Patch (Feet)			Bead (Inches)	Date Welded	Operator Name	Machine Number	Test Type	Test Results	Date Complete
133	WD	10/11	NA	±43' NOST	P	1.5	X	1	NA	12/6/20	SP	5514	VAC	PASS	12/6/19
134	WD	11/12	NA	±55' NOST	p	1	X	1	NA	12/6/20	SP	5514	VAC	PASS	12/6/19
135	WD	25/26	NA	in anchor trench	p	2	X	4	NA	12/6/20	SP	5514	VAC	PASS	12/6/19
136	WD	14/24	NA	±49' WOET	p	1	X	1.5	NA	12/5/20	TC	1117	VAC	PASS	12/6/19
137	WD	NA	34	±74' WOET, middle of panel	p	2	X	1	NA	12/3/20	OC	5514	VAC	PASS	12/6/19
138	WD	61/40	NA	cut length of seam to pull out wrinkles	C	1	X	90	NA	12/3/20	OC	5514	VAC	PASS	12/6/19
139	WD	34-35/33	NA	wind blown tear	C	2	X	350	NA	12/3/20	OC	5514	VAC	PASS	12/6/19
140	WD	33-13	NA	cut length of seam to pull out wrinkles	B	NA	X	NA	276	12/5/20	OC	5514	VAC	PASS	12/6/19

Eric Winiecki Declaration
Exhibit R



March 1, 2021
Yakima Valley Dairies | SDWA-10-2013-0080

ANCHOR QEA

Yakima Valley Dairies 2020 Annual Report

Prepared for Cow Palace, LLC
George DeRuyter & Son Dairy, LLC; D&A Dairy, LLC; George & Margaret, LLC
Liberty Dairy, LLC; H&S Bosma Dairy

March 1, 2021
Yakima Valley Dairies | SDWA-10-2013-0080

Yakima Valley Dairies 2020 Annual Report

Prepared for
Cow Palace, LLC
George DeRuyter & Son Dairy, LLC; D&A Dairy, LLC;
George & Margaret, LLC
Liberty Dairy, LLC; H&S Bosma Dairy

Prepared by
Anchor QEA, LLC
1119 Pacific Avenue, Suite 1600
Tacoma, Washington 98042
In association with Agrimanagement, Inc.,
and Landau Associates, Inc.

Project Number: 210996-01.01
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TABLE OF CONTENTS

Executive Summary ES-1

1 Introduction 1

2 Alternative Drinking Water Supply 2

2.1 Evaluation and Treatment System Installations 2

2.2 2020 Maintenance of Water Systems 2

3 Actions to Further Control Potential Sources of Nitrogen 3

3.1 Solid Separators 3

3.2 Backflow Prevention 4

3.3 Cow Pens 4

3.4 Roof Runoff 4

3.5 Elimination of Furrow Irrigation 5

3.6 Lagoons 5

3.6.1 Cow Palace Dairy 5

3.6.2 Liberty/H&S Bosma Dairies 7

3.6.3 George DeRuyter & Son/D&A Dairies 11

4 Groundwater Monitoring Network 14

4.1 Groundwater Monitoring Quality Assurance Project Plan 14

4.2 Well Installation and Maintenance 14

4.2.1 Dedicated Bladder Pumps 15

4.2.2 Monitoring Well Pressure Transducers 15

4.3 Quarterly Groundwater Monitoring Data Reports 15

4.4 Summary of Findings 16

5 Actions to Ensure Effective Nutrient Management 19

5.1 Application Fields 19

5.2 Irrigation Water Management 20

5.2.1 Sensor Installation and Maintenance 20

5.2.2 Irrigation Monitoring Results 21

5.3 Cow Palace Dairy Application Fields 22

5.3.1 Soil Nitrate Level Summary 22

5.3.2 Application Field Management 22

5.3.3 Field Moisture Management 23

5.4 Liberty/H&S Bosma Dairies Application Fields 23
5.4.1 Soil Nitrate Level Summary 23
5.4.2 Application Field Management 24
5.4.3 Field Moisture Management 24
5.5 George DeRuyter & Son/D&A Dairies Application Fields 25
5.5.1 Soil Nitrate Level Summary 25
5.5.2 Application Field Management 26
5.5.3 Field Moisture Management 26
5.6 Off-Site Transfers 26
5.6.1 Off-Site Liquid Manure Transfers 27
5.6.2 Off-Site Solid Manure Transfers 28
5.6.3 Compost Production 28

6 Other Reports, Plans, and Actions 30
6.1 Annual Reports 30
6.2 Quality Assurance Project Plans 30
6.3 Health and Safety Plan 30
6.4 Public Involvement 31

7 References 32

8 Certifications 38
Cow Palace Dairy Certification 38
George DeRuyter & Son Dairy, D&A Dairy, and George & Margaret Certification 39
Liberty Dairy Certification 40

TABLES

Table 1 Reverse Osmosis System Maintenance Summary, 2013 to 2020
Table 2 Cow Palace Lagoons Lined Prior to 2020 – Summary of Gallons Measured During 2020
Table 3 Groundwater Monitoring Well Construction Data
Table 4 Historical Groundwater Chemistry Data, 2013 to 2020
Table 5 Water Level and Water Table Elevations, 2013 to 2020
Table 6 Cow Palace Dairy Application Field Management Summary and Recommendation Calculations, Crop Years 2015 to 2020
Table 7 Liberty/H&S Bosma Dairies Application Field Management Summary and Recommendation Calculations, Crop Years 2015 to 2020

Table 8	George DeRuyter & Son/D&A Dairies Application Field Management Summary and Recommendation Calculations, Crop Years 2015 to 2020
Table 9a	Cow Palace Dairy Manure Nutrient Concentrations – Total N, 2013 to 2020
Table 9b	Cow Palace Dairy Manure Nutrient Concentrations – Total NH4, 2013 to 2020
Table 9c	Cow Palace Dairy Manure Nutrient Concentrations – Total P, 2013 to 2020
Table 9d	Cow Palace Dairy Manure Nutrient Concentrations – Total K, 2013 to 2020
Table 10a	Liberty Dairy Manure Nutrient Concentrations – Total N, 2013 to 2020
Table 10b	Liberty Dairy Manure Nutrient Concentrations – Total NH4, 2013 to 2020
Table 10c	Liberty Dairy Manure Nutrient Concentrations – Total P, 2013 to 2020
Table 10d	Liberty Dairy Manure Nutrient Concentrations – Total K, 2013 to 2020
Table 11a	George DeRuyter & Son Dairy Manure Nutrient Concentrations – Total N, 2013 to 2020
Table 11b	George DeRuyter & Son Dairy Manure Nutrient Concentrations – Total NH4, 2013 to 2020
Table 11c	George DeRuyter & Son Dairy Manure Nutrient Concentrations – Total P, 2013 to 2020
Table 11d	George DeRuyter & Son Dairy Manure Nutrient Concentrations – Total K, 2013 to 2020
Table 12	Irrigation Sensor Review – 2020 Field Capacity Exceedance List
Table 13	2020 Cow Palace Dairy Application Field Soil Sample Results
Table 14	Cow Palace Dairy Application Field Soil Nitrate Concentrations, 2013 to 2020
Table 15	2020 Liberty/H&S Bosma Dairies Application Field Soil Sample Results
Table 16	Liberty/H&S Bosma Dairies Application Field Soil Nitrate Concentrations, 2013 to 2020
Table 17	2020 George DeRuyter & Son/D&A Dairies Application Field Soil Sample Results
Table 18	George DeRuyter & Son/D&A Dairies Application Field Soil Nitrate Concentrations, 2013 to 2020
Table 19	2020 Cow Palace Dairy Off-Site Liquid Manure Transfers
Table 20	2020 Liberty/H&S Bosma Dairies Off-Site Liquid Manure Transfers
Table 21	2020 George DeRuyter & Son/D&A Dairies Off-Site Liquid Manure Transfers
Table 22	2020 Cow Palace Dairy Off-Site Solid Manure Transfers
Table 23	2020 Liberty/H&S Bosma Dairies Off-Site Solid Manure Transfers
Table 24	2020 George DeRuyter & Son/D&A Dairies Off-Site Solid Manure Transfers
Table 25	2020 Off-Site First-Party Compost Sales

FIGURES

Figure 1	Dairy Locations and Monitoring Well Network
Figure 2	Residential Well Sampling Nitrate Analytical Results
Figure 3	Progress of Lagoon Lining and Abandonments
Figure 4	Conceptual Site Model
Figure 5	Conceptual Site Model Flow Chart
Figure 6	2020 Groundwater Nitrate Concentrations
Figure 7	2020 Groundwater Nutrient Concentrations
Figure 8	2020 Groundwater Anion Concentrations
Figure 9	2020 Groundwater Metals Concentrations
Figure 10	2020 Groundwater Alkalinity Concentrations
Figure 11a	Surficial Aquifer Groundwater Elevation Contour Map First Quarter 2020
Figure 11b	Surficial Aquifer Groundwater Elevation Contour Map Second Quarter 2020
Figure 11c	Surficial Aquifer Groundwater Elevation Contour Map Third Quarter 2020
Figure 11d	Surficial Aquifer Groundwater Elevation Contour Map Fourth Quarter 2020
Figure 12	Groundwater Nitrate Concentrations ñ East Downgradient Monitoring Wells, 2013 to 2020
Figure 13	Groundwater Nitrate Concentrations ñ West Downgradient Monitoring Wells, 2013 to 2020
Figure 14	Groundwater Nitrate Concentrations ñ Central Monitoring Wells, 2013 to 2020
Figure 15	Groundwater Nitrate Concentrations ñ Northern Monitoring Wells, 2013 to 2020
Figure 16	Groundwater Nitrate Concentrations ñ Upgradient Monitoring Wells, 2013 to 2020
Figure 17	2020 George DeRuyter & Son/D&A Dairies Application Field Nitrate Exceedances in the Second Foot
Figure 18	Irrigation Water Management Plan Conceptual Site Model
Figure 19	Moisture Sensor Data ñ Example
Figure 20	2020 Cow Palace Dairy Application Field Nitrate Exceedances in the Second Foot
Figure 21a	CP-SU01 Nitrate Concentrations
Figure 21b	CP-SU02Nitrate Concentrations
Figure 21c	CP-SU03Nitrate Concentrations
Figure 21d	CP-SU04ANitrate Concentrations
Figure 21e	CP-SU04BNitrate Concentrations
Figure 21f	CP-SU05Nitrate Concentrations
Figure 21g	CP-SU06 Nitrate Concentrations

Figure 22	Number of Fields with Soil NO3 over 45 ppm in the Second Foot, Cow Palace Dairy
Figure 23	Trends in Post-Harvest Nitrate Concentrations in Cow Palace Dairy Application Fields Expressed as Area-Weighted Concentrations
Figure 24	2020 Liberty/H&S Bosma Dairies Application Field Nitrate Exceedances in the Second Foot
Figure 25a	LD-SU02 Nitrate Concentrations
Figure 25b	LD-SU03Nitrate Concentrations
Figure 25c	LD-SU04Nitrate Concentrations
Figure 25d	LD-SU05Nitrate Concentrations
Figure 25e	LD-SU06Nitrate Concentrations
Figure 25f	LD-SU07Nitrate Concentrations
Figure 25g	LD-SU08N Nitrate Concentrations
Figure 25h	LD-SU08SNitrate Concentrations
Figure 25i	LD-SU09Nitrate Concentrations
Figure 25j	LD-SU10Nitrate Concentrations
Figure 25k	LD-SU14 Nitrate Concentrations
Figure 25l	LD-SU16 Nitrate Concentrations
Figure 25m	LD-SU17 Nitrate Concentrations
Figure 26	Number of Fields with Soil NO3 over 45 ppm in the Second Foot, Liberty Dairy
Figure 27	Trends in Post-Harvest Nitrate Concentrations in Liberty/H&S Bosma Dairies Application Fields Expressed as Area-Weighted Concentrations
Figure 28a	GDS-SU01 Nitrate Concentrations
Figure 28b	GDS-SU02Nitrate Concentrations
Figure 28c	GDS-SU03Nitrate Concentrations
Figure 28d	GDS-SU04Nitrate Concentrations
Figure 28e	GDS-SU05Nitrate Concentrations
Figure 28f	GDS-SU06Nitrate Concentrations
Figure 28g	GDS-SU07Nitrate Concentrations
Figure 28h	GDS-SU08Nitrate Concentrations
Figure 28i	GDS-SU09Nitrate Concentrations
Figure 28j	GDS-SU10Nitrate Concentrations
Figure 28k	GDS-SU11 Nitrate Concentrations
Figure 28l	GDS-SU12 Nitrate Concentrations
Figure 28m	GDS-SU13 Nitrate Concentrations
Figure 28n	GDS-SU14 Nitrate Concentrations

Figure 29	Number of Fields with Soil NO3 over 45 ppm in the Second Foot, George DeRuyter & Son Dairy
Figure 30	Trends in Post-Harvest Nitrate Concentrations in George DeRuyter & Son/D&A Dairies Application Fields Expressed as Area-Weighted Concentrations
Figure 31	2020 Off-Site Liquid Manure Transfer Locations
Figure 32	2020 Off-Site Solid Manure Transfer Locations
Figure 33	2020 Off-Site First-Party Compost Sales

APPENDICES

Appendix A	Lagoon Maintenance Information
Appendix B	2020 Quarterly Groundwater Monitoring Data Reports
Appendix C	2020 Application Field Season Reports
Appendix D	2020 Cow Palace Dairy Off-Site Liquid Manure Transfer – Field Soil Sample Results
Appendix E	2020 Liberty/H&S Bosma Dairies Off-Site Liquid Manure Transfer – Field Soil Sample Results
Appendix F	2020 George DeRuyter & Son/D&A Dairies Off-Site Liquid Manure Transfer – Field Soil Sample Results

ABBREVIATIONS

AFMP	application field management plan
bgs	below ground surface
CDMA	code division multiple access
Consent Order	Administrative Order on Consent
DAF	dissolved-air flotation
Dairies	Yakima Valley Dairies
EPA	U.S. Environmental Protection Agency
GCL	geosynthetic clay liner
HASP	health and safety plan
HDPE	high-density polyethylene
IWMP	irrigation water management plan
K	potassium
MCL	maximum contaminant level
MDL	method detection level
MG	millions of gallons
mg/L	milligrams per liter
N	nitrogen
NH4	ammonium
NDN	nitrification/denitrification
NE Catch Basin	Cow PalaceDairy Northeast Catch Basin
NRCS	Washington Natural Resources Conservation Service
NW Catch Basin	Cow PalaceDairy Northwest Catch Basin
O&M	operations and maintenance
P	phosphorus
ppm	parts per million
QAPP	quality assurance project plan
RO	reverse osmosis
SOW	Statement of Work
TKN	total Kjeldahl nitrogen
VWC	volumetric water content
Yakima Valley Dairies	1) Cow Palace, LLC; 2) D&A Dairy, LLC (also known as Dand A Dairy, L.L.C.), George DeRuyter & Son Dairy, LLC, and George & Margaret, LLC; and 3) Liberty Dairy, LLC, and its associated dairy facility H&S Bosma Dairy

Executive Summary

This Annual Report was prepared by Anchor QEA, LLC, in association with Agrimanagement, Inc., and Landau Associates, Inc. It summarizes activities that were undertaken in 2020 by several dairies (Dairies) that signed an Administrative Order on Consent (Consent Order) Docket No. SDWA-10-2013-0080 with the U.S. Environmental Protection Agency (EPA) in March 2013 to address nitrate contamination of a drinking water aquifer beneath and downgradient of their Dairy facilities.

In 2020, 1) Cow Palace, LLC; 2) George DeRuyter & Son Dairy, LLC, D&A Dairy, LLC (also known as D and A Dairy, L.L.C.), and George & Margaret, LLC; and 3) Liberty Dairy, LLC, and its associated dairy facility H&S Bosma Dairy (collectively referred to as the Yakima Valley Dairies or Dairies) continued performing activities consistent with the requirements of the Consent Order. The goal of the work conducted in accordance with the Consent Order is to achieve drinking water quality that meets the EPA maximum contaminant level (MCL) for nitrate of 10 milligrams per liter (mg/L) in the drinking water aquifer beneath and downgradient of the Dairies. Four Consent Order objectives support this goal, including providing safe drinking water to residents whose well water exceeds the nitrate federal drinking water standard, taking actions to control potential sources of nitrogen at the Dairies, monitoring groundwater to ensure the effectiveness of source control actions, and ensuring effective nutrient management at the Dairies to reduce the introduction of nitrate to the drinking water aquifer.

The relationship of the Dairy facilities with nitrate migration and groundwater contamination is depicted in the conceptual site model contained in this Annual Report (Figures 4 and 5). Data summarized in this Annual Report were collected and analyzed by the Dairies in accordance with EPA-approved quality assurance project plans (QAPP) to ensure that all data are of known and documented quality, of sufficient quantity, legally defensible, and suitable for their intended use.

In accordance with the Consent Order, in 2013 the Dairies identified 223 private residences within the boundary of, or within 1 mile downgradient of their facilities. Forty-six residences already had reverse osmosis (RO) treatment units in place, and 66 additional residences exceeded the nitrate MCL as determined by laboratory analysis conducted by the Dairies. Thirty-six residences were vacant, could not be reached after multiple attempts, or refused to participate in the sampling. In 2013, the Dairies offered to install and maintain RO units at residences that exceeded the MCL and offered to maintain RO units at residences that already had one. Additional RO units have been installed since that time.

In 2020, Anchor QEA contacted a total of 53 residences within the 1-mile downgradient boundary that have RO treatment systems installed or maintained by the Dairies. Treatment system maintenance visits were completed at the 41 households that responded and accepted service. At

the other 12 households, multiple contacts were attempted but were unsuccessful. Bottled water was provided to an additional four households.

The Dairies are in the process of lining 40 earthen animal waste storage lagoons to reduce or eliminate nitrogen leakage from the lagoons to subsurface soils and groundwater. In 2020, the average concentrations of total nitrogen in liquid manure samples was 1,358 parts per million (ppm) in Cow Palace lagoons, 2,187 ppm in Bosma lagoons, and 1,523 ppm in the DeRuyter lagoons (see Tables 8a, 9a, and 10a).

Lagoon lining and construction activities in 2020 resulted in the lining of the final two lagoons at Cow Palace Dairy, lining of three lagoons at George DeRuyter & Son/D&A Dairies, and the lining of three lagoons and the abandonment of one lagoon at Liberty/H&S Bosma Dairies. On a volume basis by 2020, and using the initial capacities of the original lagoons, Cow Palace Dairy has lined 100% of its 31.7-million-gallon lagoon storage capacity, Liberty/H&S Bosma Dairies has lined 39% of its 55.5-million-gallon lagoon storage capacity, and George DeRuyter & Son/D&A Dairies has lined 42%[1] of its 38.9 million-gallon lagoon storage capacity. Lining or abandonment of all the George DeRuyter & Son/D&A Dairies lagoons is scheduled to be completed by the end of 2021. Lining of all the Liberty/H&S Bosma Dairies lagoons is scheduled to be completed by the end of 2022.

In 2020, the George DeRuyter & Son Dairy continued to operate its manure digester, producing low-carbon biogas for alternative fuels production. The Dairy also continued to operate its nitrogen treatment system called a nitrification/denitrification (NDN) system in one of its lagoons to reduce the amount of nitrogen in its liquid manure . The lagoon that contains the NDN system is to be lined in 2021.

Groundwater monitoring continued throughout 2020 . Groundwater nitrate concentrations in 2020 in the 26 site monitoring wells were as follows:

- Three of four upgradient wells were below the MCL of 10 mg/L.
- Four of five northern wells were below the MCL.
- One of 17 downgradient wells, YVD-17, was below the MCL.

Historical groundwater concentration plots for nitrate are included in Figures 12 through 16.

In support of the objective of effective nutrient management, the Dairies continued pre-plant and post-harvest soil and manure sampling to help ensure that the application of nitrogen to their crop

[1] Calculations of total initial lagoon volumes were based on the pie chart information in Figure 3, which is provided in millions of gallons (MG): for Cow Palace Dairy, 31.7 MG (lined capacity) + 0 MG (unlined capacity) = 31.7 MG (total capacity); for H&S Bosma Dairy, 21.6 MG + 33.9 MG = 55.5 MG; and for George DeRuyter & Son Dairy, 16.4 MG + 22.5 MG = 38.9 MG. Calculations for percentage of total volume lined were as follows: for Cow Palace Dairy, 31.7 MG (lined) / 31.7 MG (total) * 100 = 100% lined at the end of 2020; for H&S Bosma Dairy, 21.6 MG/55.5 MG = 39%; for George DeRuyter & Son Dairy, 16.4 MG/ 38.9 MG = 42%. Percentages are rounded.

fields does not exceed agronomic rates. Overall, nitrogen levels in fields to which manure is applied have declined significantly from excessive levels that were measured by the Dairies in 2013 (Figures 23, 27, and 30). Historical nitrate concentration charts for each field are provided in Figures 21a through 21g, 25a through 25m, and 28a through 28n.

Fall nitrate concentrations in all application fields at Cow Palace Dairy and Liberty/H&S Bosma Dairies remained below the 45 ppm target at the 2-foot depth interval (12 to 24 inches).

Exceedances of the 45 ppm target for nitrate concentrations in 2020 were limited to three DeRuyter application fields (Figure 17). Fields GDS-SU04 and GDS-SU05 both exceeded the target in early spring but dropped below the target in follow-up soil sampling. In fall, GDS-SU05 exceeded the target, as did field GDS-SU08.

The Dairies collected "post-harvest" representative soil samples from the 1-foot depth, the 2-foot depth, and the 3-foot depth intervals below ground surface from each application crop field. EPA has estimated, based on the Dairies' data, the number of tons of nitrate present at each soil depth in the Dairy's application fields in fall 2020. Collectively in all the Dairies' crop fields, there were about 95 tons of nitrate-N at the 1-foot soil depth, about 93 tons at the 2-foot depth, and about 117 tons at the 3-foot depth. The purpose of the 3-foot soil depth samples is to provide information regarding the soil nitrate concentrations below the crop root zone (see Consent Order Statement of Work Section III.F.1.e). These estimates were developed by multiplying the area-weighted nitrate-N estimates developed by the Dairies for each crop field at each soil depth, multiplying by the number of acres of crop fields for each Dairy to estimate the pounds of nitrate in the fields for each Dairy at each depth, adding the pounds at each soil depth at each Dairy to estimate the total pounds of nitrate at all the Dairies at each soil depth, and dividing by 2,000 to convert to tons. These estimates do not include additional nitrogen in the form of ammonium, mineralization from past manure, or mineralization from organic matter, which are likely to break down and form additional nitrate. Nitrate is highly mobile in water, and the nitrate in the soil column is vulnerable to leaching and migration into the groundwater. The Dairies have converted many of their fields to alfalfa production. Established multiyear stands of alfalfa can pull nitrate out of the soil deeper than 2 feet if the roots are allowed sufficient time to grow deeper into the soil profile.

To minimize the discharge of nitrate-laden irrigation water out of the root zone, the Dairies continued to monitor soil moisture levels in their application fields (see the charts in Appendix C). The Consent Order requires at least two soil moisture monitoring locations in each of the Dairies' 34 application fields. Each monitoring location, or "station," includes three sensors at different soil depths. Most fields have two sensor stations, and some have three. The number of stations identified for placement in each field was based on consideration of the location and type of susceptible areas (those areas within each field that may be the most susceptible to the migration of irrigation water below the crop root zone, such as low-lying areas within soils with the greatest permeability) as well

as the irrigation method being used in that field. The Dairies installed 82 moisture sensor stations in 2,303 acres of application fields, which on average is one station for every 28 acres. Table 2 summarizes the network of irrigation sensor stations.

Movement of nitrate-laden water out of the root zone can also mobilize nitrate deeper in the soil column from past over-applications of nitrogen and transport it to the drinking water aquifer.

During 2020, upgrades and repairs were completed to return the set of 82 irrigation sensors to full operation. This was necessary to correct equipment failures from harvest damage and equipment malfunction.

Based on data from operating sensor stations, seven of the 34 application fields exceeded field capacity at least once. Some of these exceedances appear to be due to spring wet weather conditions unrelated to field irrigation. It is impossible to eliminate the discharge of nitrate-laden water from all fields all the time, but the duration of discharges due to irrigation can be managed if enough data is properly collected and utilized.

The Dairies continued to implement controls and monitoring for their off-site shipments of manure. In areas where groundwater nitrate levels are known by the Dairies to exceed the MCL (10 mg/L nitrate-N), those controls include the collection of soil testing data collected prior to shipment of manure or compost to that off-site application field (see Appendices D, E, and F).

1 Introduction

This Annual Report was prepared by Anchor QEA, LLC, in association with Agrimanagement, Inc., and Landau Associates, Inc., on behalf of: 1) Cow Palace, LLC; 2) George DeRuyter & Son Dairy, LLC, D&A Dairy, LLC (also known as D and A Dairy, L.L.C.), and George & Margaret, LLC; and 3) Liberty Dairy, LLC, and its associated dairy facility H&S Bosma Dairy (collectively referred to as the Yakima Valley Dairies [Dairies]). Dairy locations are shown in Figure 1.

This report outlines activities undertaken by the Dairies pursuant to Administrative Order on Consent (Consent Order) Docket No. SDWA-10-2013-0080 (EPA 2013) and Statement of Work (SOW) during the calendar year 2020, which covers the period from January 1 to December 31, 2020. This report includes the information required by Section III.K.2 of the SOW.

The goal of the work conducted in accordance with the Consent Order is to achieve drinking water quality that meets the U.S. Environmental Protection Agency (EPA) maximum contaminant level (MCL) for nitrate of 10 milligrams per liter (mg/L) in the drinking water aquifer beneath and downgradient of the Dairies. The objectives of the work conducted in accordance with the SOW are as follows:

1. Expeditiously provide a permanent, safe alternative drinking water supply to residents using private drinking water wells that exceed the MCL for nitrate (nitrate as nitrogen, or N03-N) and are on or within 1 mile downgradient of the Dairies.
2. Take specific actions to further control potential sources of nitrogen at the Dairies.
3. Establish a network of monitoring wells to measure the effectiveness of the nitrogen source reduction actions on water quality in the shallow alluvial aquifer that serves as an underground source of drinking water.
4. Ensure effective nutrient management at the Dairies to reduce the introduction of nitrate to an underground source of drinking water.

In 2020, EPA and the Dairies corresponded via teleconference meetings, document submittals, and EPA comment letters regarding a number of actions pursuant to the Consent Order. EPA comment letters are noted (as applicable) throughout this report.

2 Alternative Drinking Water Supply

2.1 Evaluation and Treatment System Installations

In 2013, the Dairies consultant, Inland Earth Sciences (IES), conducted testing of groundwater at residences located downgradient of the Dairies. Groundwater testing was performed at 141 locations where access was obtained from the property owners (Figure 2). At 75 of these locations, groundwater nitrate concentrations were below the MCL.

At the remaining locations, the Dairies offered in 2013 to fund the installation and maintenance of reverse osmosis (RO) treatment systems or to provide bottled water. A total of 36 residences accepted the offer for a new RO system, and 9 residences were supplied with bottled water. In addition, the Dairies also committed to maintain RO systems at an additional 15 residences where RO systems had been previously installed by the residences.

2.2 2020 Maintenance of Water Systems

As of 2020, there were a total of 53 residences with within the 1-mile downgradient boundary of the Dairies that have accepted water system installation or maintenance. A summary of 2020 outreach and maintenance activities for these 53 residences is summarized in Table 1. Outreach activities included mailing of English/Spanish postcards, conducting two rounds of phone outreach, and conducting two rounds of door-to-door visits.

Twelve residences did not respond to any of the outreach efforts. For the remaining 41 households, maintenance visits were scheduled and completed.

Four households were provided with bottled water in addition to a RO system. Bottled water was provided to an additional four households that do not have installed RO systems.

3 Actions to Further Control Potential Sources of Nitrogen

This section describes the status of actions taken to control potential sources of nitrogen from the Dairies, apart from the management of application fields. Application field management is discussed in Section 5.

3.1 Solid Separators

Section III.F.4 of the SOW requires the Dairies to take action within 60 days of the Effective Date of the Consent Order to reduce nitrate contributions from solid separators at each Dairy. Actions must include the following: 1) relocating solid separators onto an impervious surface; 2) installing a berm and containing areas receiving solids; and 3) directing leachate to storage ponds or lagoons.

In 2013, a review was conducted of the solid separator areas at each Dairy. Results indicated solid separator areas at each Dairy were found to be in compliance with the requirements of the SOW, as described in the 2013 Annual Report (IES 2016).

In 2020, the solids separation systems at each Dairy included the following:

- Slope screen separator and polymer system at Cow Palace Dairy (this system replaced the centrifuge previously operated by the Dairy as described subsequently)
- Centrifuge system at Liberty/H&S Bosma Dairies
- Dissolved-air flotation (DAF) system at George DeRuyter & Son/D&A Dairies

In 2020, Cow Palace Dairy installed a polymer system to improve solids separation and nutrient recovery from its manure streams. Prior to installation of the polymer system, Cow Palace Dairy recovered nutrient solids from the parlor water and manure stream using a centrifuge. Manure slurry was not separated by this method and was stored in Settling Basins A and B prior to trucking to manure application fields.

Cow Palace Dairy began working with Livestock Water Recycling in 2019 to test an improved separation system utilizing polymer addition, screen separation, and mechanical dewatering of the recovered nutrient solids. Following nutrient recovery, the dewatered solids are now composted on site or exported (sold) and moved off site. Information regarding the proposed polymer system and bench-scale nutrient recovery data was presented to EPA in December 2019 (Anchor QEA 2019a), and additional information was requested by EPA on February 18, 2020 (EPA 2020).

The polymer system installation was initially delayed due to vendor interruptions attributed to the COVID-19 public health emergency. The system was fully installed and operational in September 2020, and nutrient testing was conducted by Agrimanagement on October 20, 2020. Testing results were submitted to EPA in a letter dated November 13, 2020 (LAI 2020a). Cow Palace Dairy intends to continue operation of the polymer system in lieu of the centrifuge.

3.2 Backflow Prevention

Section III.F.5 of the SOW requires the Dairies to install and maintain backflow prevention devices within 30 days of the Effective Date of the Consent Order to protect wells at each Dairy.

In 2013, the presence of backflow prevention devices at each Dairy was confirmed, as described in the 2013 Annual Report (IES 2016). The Dairies' backflow prevention devices are detailed as follows:

- Liberty Dairy and H&S Bosma Dairy had pre-existing backflow preventers on its three production wells.
- Cow Palace Dairy also had existing backflow preventers on its four production wells.
- George DeRuyter & Son Dairy and D&A Dairy had a total of three production wells. Two of the three wells had previously installed backflow preventers. The third was installed in 2014.

In 2020, the backflow prevention devices remained operational.

3.3 Cow Pens

Section III.F.10 of the SOW requires the Dairies to minimize the ponding of liquid in the cow pen areas to reduce infiltration of nitrogen-rich water.

In 2020, the Dairies continued implementing cow pen management actions at each Dairy to prevent liquid ponding and infiltration. Pens were graded to ensure liquid generated in the pens was conveyed to each Dairy's lagoon system. Low spots occurring over time as a result of cow traffic were regraded and filled to prevent ponding. Cow pens were scraped on a weekly basis to remove accumulated manure and bedding material from the areas. Additionally, feed-mixing areas are located on asphalt or concrete surfaces, and Dairies with free stalls (Liberty/H&S Bosma Dairies and George DeRuyter & Son/D&A Dairies) are equipped with concrete flush lanes.

3.4 Roof Runoff

Section III.F.11 of the SOW requires the Dairies to confirm that roof runoff is not allowed to pond on the ground and infiltrate; roof runoff must either be kept separated from contaminated areas or directed to lagoons.

In 2020, roof runoff continued to be conveyed to the Dairies' lagoon systems. Roof runoff in animal operation areas is conveyed to the cow pens and feed lanes either by gutter or direct runoff from the roof surface. From the cow pens and feed lanes, the roof runoff is directed to the lagoon system. Roof runoff in feed-mixing areas is conveyed to the drains associated with the silage piles. Roof runoff controls are described in the 2013 Annual Report (IES 2016).

3.5 Elimination of Furrow Irrigation

Section III.F.8 of the SOW requires the Dairies to eliminate furrow irrigation at each Dairy within 2 years of the Effective Date of the Consent Order. Furrow irrigation, also known as flood irrigation, is an age-old irrigation technique that irrigates fields by running water in furrows between the crop rows. Furrow irrigation results in over-saturation of parts of the field and has been shown to result in a higher incidence of water and nutrient transport below the root zone in comparison to sprinkler irrigation.

In 2013, the Dairies had several crop fields that still employed furrow irrigation. Furrow irrigation was eliminated at each Dairy by converting these remaining fields to sprinkler systems, as described in the 2013 Annual Report(IES 2016).

In 2020, no furrow irrigation was used by the Dairies.

3.6 Lagoons

Section III.F.6 of the SOW requires the Dairies to submit to EPA a Lagoon Review Report within 60 days of the Effective Date of the Consent Order demonstrating the existing lagoons were constructed to the current Washington Natural Resources Conservation Service (NRCS) 313 standard. The Dairies submitted Lagoon Review Reports (ARCADIS 2013a, 2013b, 2013c) that were approved by EPA on July 11, 2013. Save for one lagoon, Cow Palace Lagoon No 4, the Dairies did not provide documentation that showed that their other 40 lagoons were designed and built to meet current NRCS standards.

For the 40 lagoons that did not meet the current NRCS 313 standard, the Dairies were required to submit a Lagoon Evaluation Plan to assess whether the lagoons met the standard. In 2014, the Dairies submitted a Lagoon Evaluation Method Determination QAPP (ARCADIS 2014) and Lagoon Evaluation QAPPs (IES 2014a, 2014b, 2014c). However, on February 6, 2015, the Dairies notified EPA of their election to forgo testing of the lagoons and instead begin lining them in accordance with the requirements in the Consent Order.

In 2020, the Dairies lined several lagoons in accordance with Section III.F.6 of the SOW.

3.6.1 Cow Palace Dairy

Cow Palace Dairy has elected to line its manure storage lagoons with a double-membrane liner system. This system includes two high-density polyethylene (HDPE) liners separated by a drainage layer. The drainage layer can consist of a layer of geocomposite material (as used for the Northwest Catch Basin [NW Catch Basin] lined in 2016) or a lower membrane liner with a dimpled surface that allows drainage between the liners without the need for a geocomposite (as used on Consolidated Lagoon No. 2). A leak detection system is installed between the liners to detect and collect accumulations of leachate

associated with leaks in the upper liner should they occur. Monitoring of leachate production from this system is used to determine when repairs of the upper liner are required.

Cow Palace Dairy has also upgraded its lagoon network to expand storage capacity in some lagoons (e.g., the consolidation and expansion of Lagoon Nos. 2 and 3 in 2017 and the consolidation and expansion of Settling Basins A and B in 2020) and eliminate other unneeded lagoons. This included the abandonment of one of the Cow Palace Dairy lagoons (the Northeast Catch Basin [NE Catch Basin]).

In 2020, design and construction activities conducted included the development and implementation of the lining design for consolidated Settling Basins A and B (now referred to as Settling Basin AB). Lagoon operations and maintenance (O&M) activities were performed for the other existing lined lagoons. These activities are described in more detail in Sections 3.6.1.1 and 3.6.1.2. The status of the Cow Palace Dairy lagoon program is summarized in Figure 3.

3.6.1.1 Lining Design for Cow Palace Dairy Settling Basin AB

In early 2020, pre-design investigations were conducted for Settling Basin AB including surveys and soil testing. The Basis of Design Report for combining and lining Settling Basins A and B was submitted to EPA on July 15, 2020 (LAI 2020b), and approved by EPA on September 18, 2020 (EPA Letter 229).

Construction began at Settling Basin AB in early October 2020, including site preparation, excavation and grading, subgrade preparation, anchor trench excavation, inlet piping installation, liner system installation, and leak detection system startup and testing. Lagoon lining work for Settling Basin AB was completed at the end of November 2020 and the lagoon was returned to service. A Completion Report will be submitted to EPA by February 26, 2021, documenting lagoon construction.

3.6.1.2 Operations and Maintenance of Existing Lined Lagoons

In 2020, Cow Palace Dairy staff continued with the O&M of its lagoon system per the Cow Palace Dairy Facility Operations, Maintenance, and Monitoring Plan (WET 2018) O&M activities for existing lined lagoons included the following:

- **NW Catch Basin:** The NW Catch Basin was lined in 2016. Lagoon inspections and maintenance activities were completed in accordance with the O&M plan for this lagoon during 2020. A total of 481 gallons of leachate were generated in May 2020 as a result of a pumping training exercise (Table 2). No significant maintenance or repair activities were required.
- **Consolidated Lagoon No. 2:** This lagoon was expanded (including consolidation with former Lagoon No. 3) and lined in 2017. Lagoon inspections were completed in accordance with the

O&M plan for this lagoon during 2020. A total of 0.12 gallon of leachate production was noted during 2020 (Table 2). No significant maintenance or repair activities were required.

- **Lagoon No. 4:** This lagoon was previously shown to comply with applicable Natural Resource Conservation Service design requirements for waste storage lagoons. It has a clay-amended soil liner. Lagoon inspections were completed during 2020. No significant maintenance or repair activities were required.
- **Lagoon No. 1:** This lagoon was lined in 2019. Lagoon inspections and maintenance activities were completed in accordance with the O&M plan for this lagoon during 2020. A total of 122,051 gallons of leachate production were noted during 2020 (Table 2) due to a liner leak in May 2020. Repair documentation can be found in Appendix A. The lagoon was returned to service and no additional leachate production has been observed since that time.
- **Safety Debris Catch Basin:** The safety debris catch basin was lined in 2019. Lagoon inspections were completed in accordance with the O&M plan for this lagoon during 2020. No leachate production was noted during 2020 (Table 2). No significant maintenance or repair activities were required.

3.6.1.3 Schedule for Future Lagoon Upgrades

Lagoon lining work at Cow Palace Dairy is complete, and no additional lagoon upgrade work is required.

3.6.1.4 Submittals and Approvals

In 2020, Cow Palace Dairy submitted the following documents related to lagoon construction:

- Cow Palace Dairy Lagoon No. 1 and Safety Debris Catch Basin Completion Report (Anchor QEA2020a) – Submitted April 2, 2020
- Settling Basin Basis of Design, Cow Palace Dairy (LAI 2020b) – Submitted July 15, 2020
- Settling Basin Basis of Design, Cow Palace Dairy (LAI 2020c) – Resubmitted August 19, 2020
- Settling Basin Basis of Design, Cow Palace Dairy (LAI 2020d) – Resubmitted September 15, 2020
- Settling Basin Basis of Design, Cow Palace Dairy (LAI 2020e) – Resubmitted September 22, 2020

Also in 2020, the following document related to the Cow Palace Dairy lagoons was approved by EPA:

- Cow Palace Settling Basin AB Basis of Design Report (LAI 2020e) – Approved September 18, 2020 (EPA Letter 229)

3.6.2 Liberty/H&S Bosma Dairies

Liberty/H&S Bosma Dairies have elected to line their manure storage lagoons with a hybrid double-liner system. This system includes an HDPE liner placed over the top of a geosynthetic clay liner

(GCL). In this system, each liner protects and reinforces the other. The upper HDPE liner protects the lower GCL from drying out or being eroded by lagoon maintenance activities. The GCL helps add durability to the lining system in that the GCL can self-seal from small punctures. In this application, the GCL also has a long operational life. Leak detection surveys for the upper liner are performed using a combination of visual and electronic leak detection surveys in alternating years.

In 2020, Liberty/H&S Bosma Dairies continued activities toward upgrading their lagoon network to expand storage capacity in some lagoons, consolidate smaller lagoons, and eliminate other unneeded lagoons. To date, this has triggered the consolidation of three Liberty Dairy lagoons in 2017 (now called Consolidated Lagoon No. 15); the abandonment of four H&S Bosma Dairy lagoons, which began in 2018; the consolidation of three H&S Bosma Dairy lagoons in 2019 (now called Consolidated Lagoon No. 10); and the consolidation of two H&S Bosma Dairy lagoons (now called Consolidated Lagoon No. 7) in 2020. Lagoon 18 was also abandoned in 2020 as described subsequently.

In 2020, design and construction activities were completed at the following lagoons:

- Lining of Lagoon No. 14
- Consolidation and lining of Lagoon Nos. 7 and 12
- Abandonment of Lagoon No. 18

These activities are described in more detail in Sections 3.6.2.1 and 3.6.2.2. The status of the Liberty/H&S Bosma Dairies lagoon program is summarized in Figure 3.

3.6.2.1 Lining Design and Implementation for Lagoons Nos. 7, 12, and 14

Lining of Lagoon Nos. 7, 12, and 14 was performed in 2020, consistent with a modified schedule approved by EPA. Pre-design data collection activities were conducted in 2020, consistent with the Lagoon Pre-Design Data Collection Quality Assurance Project Plan (QAPP) (Anchor QEA 2017a), which was approved by EPA on February 2, 2017.

In August 2020, the 100% Uniform Lagoon Lining Basis of Design Report and 100% project-specific lagoon lining design documents for Liberty/H&S Bosma Dairies were submitted to EPA (Anchor QEA 2020h). The design for Lagoon No. 14 included minor modifications. The design for Lagoon Nos. 7 and 12 included berm removal and consolidation into a single lagoon. Construction work began at Lagoon No . 14 and Consolidated Lagoon No. 7 in August 2020 and October 2020, respectively. This work included site preparation, excavation and grading, subgrade preparation, anchor trench excavation, inlet and outlet piping installation , liner system installation, and electronic leak detection testing.

Construction activities were completed by November 4, 2020, and the lagoons were returned to service. The combined as-built report was submitted to EPA in January 2021 (Anchor QEA 2021a).

3.6.2.2 Abandonment of Lagoon No. 18

Lagoon No. 18 was historically used to manage stormwater generated from the Liberty Dairy compost area. It was not used for manure storage. It is no longer needed for stormwater collection because the Dairy has installed a new stormwater collection system in this area. Following abandonment, the Lagoon will serve only as an emergency overflow basin for the new stormwater system.

The abandonment of Lagoon No. 18 was completed in 2020. Following the removal of liquids and any organic solids and vegetation by Dairy personnel, soil sampling was conducted by Anchor QEA personnel. Laboratory analysis for the soil samples was performed consistent with the 2016 Modified Lagoon Work Plan (Anchor QEA 2016a). All the samples analyzed met the abandonment target for lagoon abandonment. Nitrogen levels (the sum of ammonia-nitrogen and nitrate-nitrogen) were less than 45 milligrams per kilogram in the sidewall and lagoon bottom samples. Therefore, no additional excavation of soils was required. Lagoon No. 18 was partially backfilled with clean soil. Stormwater from the compost area is now managed by a newly installed stormwater vault that pumps collected stormwater to the Dairy's lagoon system.

3.6.2.3 Operations and Maintenance Activities for Existing Lined Lagoons

Liberty Dairy performs routine weekly inspections of its lined lagoons (Consolidated Lagoon No. 15, the Red Water Pond, Consolidated Lagoon No. 10, and Lagoon No. 6) as described in the Uniform Lagoon Operations, Maintenance, and Monitoring Plan for Bosma and DeRuyter Dairies (Anchor QEA 2020b). The routine inspections include visual inspections of the following:

- The liner for evidence of slumps of bulges
- Damage to the liner (e.g., holes, tears, or damaged seams)
- The perimeter of the lagoon, looking specifically for signs of access from animals or workers, damage to fencing/barrier, presence of trees or vegetation, wind damage, or rodent activity
- The embankments, looking for signs of erosion
- Inlet and outlet piping to check for obstructions or damage
- Accumulation of solids in the lagoon
- The agitation equipment to ensure that it is properly secured with the tethered lines and positioned away from the side slopes and bottom of the lagoon
- Gas venting piping to check for obstructions or damage

Records of the weekly inspections conducted in 2020 are included in Appendix A.

Additionally, electronic leak detection testing was performed during Fourth Quarter 2020 for Consolidated Lagoon No. 15, the Red Water Pond, Consolidated Lagoon No. 10, and Lagoon No. 6. Results of these leak detection surveys are included in Appendix A. No leaks were detected below the operating levels of the lagoons. However, one small puncture at Lagoon No. 6, a small tear at

Lagoon No. 15, and a number of small defects at the Red Water Pond and Lagoon No. 10 were detected on the upper shoulders of the lagoons above the normal operating level . All defects were repaired, and the suitability of the repairs was verified as described in Appendix A.

3.6.2.4 Submittals and Approvals

In 2020, Liberty/H&S Bosma Dairies submitted the following documents related to lagoon construction:

- H&S Bosma Dairy Lagoon No. 6 and Consolidated Lagoon No. 10 Completion Report (Anchor QEA 2020c) – Resubmitted January 8, 2020
- H&S Bosma Dairy Lagoon Nos. 8, 9, 19, and 20 Lagoon Abandonment Completion Report (Anchor QEA 2020d) – Resubmitted February 3, 2020
- Liberty/H&S Bosma Dairies Lagoon Lining Basis of Design Report (Anchor QEA 2020e) – Submitted April 30, 2020
- Liberty/H&S Bosma Dairies Lagoon No. 14 and Consolidated Lagoon No. 7 Project Specific Submittals (Anchor QEA 2020f) – Submitted June 1, 2020
- Uniform Lagoon Lining Basis of Design Report (Anchor QEA 2020g) – Submitted June 22, 2020
- Uniform Lagoon Lining Basis of Design Report Bosma and DeRuyter Dairies (Anchor QEA 2020h) – Submitted July 22, 2020
- Uniform Lagoon Lining Basis of Design Report Bosma and DeRuyter Dairies (Anchor QEA 2020i) – Resubmitted August 27, 2020
- Liberty/H&S Bosma Dairies Lagoon No. 14 and Consolidated Lagoon No. 7 Project Specific Liner Construction Plans (Anchor QEA 2020j) – Submitted August 27, 2020
- Liberty Dairy Lagoon No. 18 Abandonment Plan (Anchor QEA 2020k) – Submitted September 17, 2020
- Liberty Dairy Lagoon No. 18 Abandonment Plan (Anchor QEA 2020l) – Submitted November 3, 2020
- Liberty/Bosma – Planned 2021 Lagoon Lining Activities (Anchor QEA 2020m) – Submitted December 31, 2020

Also in 2020, the following documents related to Liberty/H&S Bosma Dairies lagoons were approved by EPA:

- Uniform Lagoon Lining Basis of Design Report Bosma and DeRuyter Dairies (Anchor QEA 2020i) – Approved July 31, 2020 (EPA Letter 224)
- Liberty/H&S Bosma Dairies Lagoon No. 14 and Consolidated Lagoon No. 7 Project Specific Liner Construction Plans (Anchor QEA 2020j) – Approved July 31, 2020 (EPA Letter 225)
- Liberty Dairy Lagoon No. 18 Abandonment Plan (Anchor QEA 2020l) – Approved November 16, 2020 (EPA Letter 233)

3.6.3 George DeRuyter & Son/D&A Dairies

George DeRuyter & Son/D&A Dairies have elected to line their manure storage lagoons with the same double-liner system used at the Liberty/H&S Bosma Dairies. That system includes an HDPE liner placed over the top of a GCL. Leak detection surveys for the upper liner are performed using a combination of visual and electronic leak detection surveys in alternating years.

In 2020, George DeRuyter & Son/D&A Dairies completed the lining of three lagoons (George DeRuyter & Son Dairy Lagoon No. 4 and D&A Dairy Lagoon Nos. 1 and 2), which is one more than required under the EPA-approved schedule. The Dairies also continued activities toward upgrading their lagoon network to optimize the storage capacity of their lagoon system, with expansions and consolidations where appropriate. To date, this has included the consolidation and lining of Lagoon Nos. 3 and 4 at D&A Dairy in 2017, the expansion of the Stormwater Catch Basin at George DeRuyter & Son Dairy in 2018, and the consolidation and expansion of D&A Dairy Lagoon Nos. 1 and 2 as described subsequently.

The upgraded manure digestor and DAF unit remained operational. The Dairy also continues to operate a nitrification/denitrification (NDN) treatment system to reduce nitrogen concentrations in the Dairy's liquid manure.

Lagoon lining activities for 2020 are described in more detail in Sections 3.6.3.1 and 3.6.3.2. The status of the George DeRuyter & Son/D&A Dairies lagoon program is summarized in Figure 3.

3.6.3.1 Manure Digester, DAF, and NDN Treatment System

The George DeRuyter & Son Dairy three-lane manure digester remains in successful operation. Repairs and upgrades to the digester were completed in 2019, in coordination with Regenis, an experienced digester company, and Promus Energy LLC, a sustainable biofuels marketing company. The digester has been in continuous biogas production since that time.

As of year-end 2020, the digester and DAF remain in good operation. All gas-cleaning equipment is operational, and low-carbon biogas is being trucked to an off-site pipeline injection point. On-site injection of the cleaned biogas will begin as soon as Yakima County completes the gas line extension out to the Dairy. Completion of the gas line extension project is currently anticipated to occur in early 2021.

3.6.3.2 Lining Design and Implementation for George DeRuyter & Son Lagoon No. 4 and D&A Dairy Lagoon Nos. 1 and 2

The EPA approved schedule required completion of lagoon lining for Lagoon Nos. 1 and 2 at D&A Dairy. The Dairies submitted revised design documents to support the consolidation and lining of these two lagoons. The design was approved by EPA on July 31, 2020.

The Dairies proposed to expedite the lining of George DeRuyter & Son Dairy Lagoon No. 4. That design was submitted to EPA in September 2020. The design was approved by EPA on November 16, 2020.

Construction activities at Lagoon 4 were completed in November of 2020. Construction activities at George DeRuyter & Son Dairy Lagoon Nos. 1 and 2 were completed at the end of December 2020. Completion reports are under development and will be submitted to EPA for review in accordance with the EPA-approved schedule.

3.6.3.3 Operations and Maintenance Activities for Existing Lined Lagoons

In 2020, D&A Dairy and George DeRuyter & Son Dairy performed routine weekly inspections of Consolidated Lagoon No. 3 and the Stormwater Catch Basin, as described in the Uniform Lagoon Operations, Maintenance, and Monitoring Plan for Bosma and DeRuyter Dairies (Anchor QEA 2020b). The routine inspections include visual inspections of the following:

- The liner for evidence of slumps of bulges
- Damage to the liner (e.g., holes, tears, or damaged seams)
- The perimeter of the lagoon, looking specifically for signs of access from animals or workers, damage to fencing/barrier, presence of trees or vegetation, wind damage, or rodent activity
- The embankments, looking for signs of erosion
- Inlet and outlet piping to check for obstructions or damage
- Accumulation of solids in the lagoon
- The agitation equipment to ensure that it is properly secured with the tethered lines and positioned away from the side slopes and bottom of the lagoon
- Gas venting piping to check for obstructions or damage

Records of the weekly inspections conducted in 2020 are included in Appendix A.

Additionally, electronic leak detection surveys were performed during Fourth Quarter 2020 for Consolidated Lagoon No. 3 and the Stormwater Catch Basin. Results of the leak detection surveys are contained in Appendix A. One small puncture was identified at the Stormwater Catch Basin above the lagoon operating level. This puncture was repaired. In Lagoon No. 3, 22 small punctures were identified and repaired. In addition, a small electrical signal was noted that could indicate a potential leak or a ground connection near a pipe connection in a portion of Lagoon No. 3. Consistent with the EPA-approved Operations, Maintenance, and Monitoring Plan, that area will be re-checked when the lagoon is emptied in mid- 2021. If a leak is identified, it will be repaired. Results of the re-check and repair (if applicable) for this area will be summarized as part of monthly progress reporting.

3.6.3.4 Submittals and Approvals

George DeRuyter & Son/D&A Dairies submitted the following documents related to lagoon construction activities in 2020:

- Lagoon Lining Clarification Letter – George DeRuyter & Son/D&A Dairies (Anchor QEA 2020o) – Submitted April 14, 2020
- George DeRuyter & Son/D&A Dairies Lagoon Lining Basis of Design Report (Anchor QEA 2020p) – Submitted April 30, 2020
- D&A Dairy Consolidated Lagoon No. 1 Project-Specific Submittals (Anchor QEA 2020q) – Submitted June 1, 2020
- Uniform Lagoon Lining Basis of Design Report (Anchor QEA 2020g) – Submitted June 22, 2020
- Uniform Lagoon Lining Basis of Design Report – Bosma and DeRuyter Dairies (Anchor QEA2020h) – Submitted July 22, 2020
- D&A Dairy Consolidated Lagoon No. 1 Project-Specific Liner Construction Plans (Anchor QEA2020r) – Submitted July 22, 2020
- Uniform Lagoon Lining Basis of Design Report – Bosma and DeRuyter Dairies (Anchor QEA2020i) – Resubmitted August 27, 2020
- D&A Dairy Lagoon No. 4 Project-Specific Liner Construction Plans (Anchor QEA2020s) – Submitted September 24, 2020
- George DeRuyter & Son Dairy Lagoon No. 4 Project-Specific Liner Construction Plans (Anchor QEA2020t) – Submitted November 3, 2020
- DeRuyter – Planned 2021 Lagoon Lining and Abandonment Activities (Anchor QEA 2020u) – Submitted December 30, 2020

Also in 2020, the following documents related to George DeRuyter & Son/D&A Dairies lagoons were approved by EPA:

- Uniform Lagoon Lining Basis of Design Report – Bosma and DeRuyter Dairies (Anchor QEA2020i) – Approved July 31, 2020 (EPA Letter 224)
- D&A Dairy Consolidated Lagoon No. 1 Project-Specific Liner Construction Plans (Anchor QEA2020r) – Approved July 31, 2020 (EPA Letter 225)
- D&A Dairy Lagoon No. 4 Project-Specific Liner Construction Plans (Anchor QEA 2020s) – Approved November 16, 2020 (EPA Letter 225)

4 Groundwater Monitoring Network

Throughout 2020, the Dairies continued ongoing g roundwater monitoring activities. The monitoring well network at the Dairies (Figure 1 and Table 1) consists of 26 monitoring wells screened in the surficial aquifer. Most of the wells (23 wells) are screened across the shallow water table. The remaining wells (3 wells) are deeper wells that are paired with water table wells.

Figures 4 and 5 summarize potential on-site sources of nitrogen at the Dairies and identify key transport mechanisms and exposure pathways. The monitoring well network serves as a tool to evaluate how the aquifer is responding to actions taken to control these potential sources and transport pathways. The groundwater monitoring data are used by EPA to supplement and verify existing information at the Dairies.

A list of the wells in the network and well construction data are shown in Table 3 and are detailed as follows:

- Seven of the wells were installed by EPA in 2012 (EPA wells; identified as DC-01, DC-03, DC-04, DC-05, DC-07, DC-09, and DC-14).
- The remaining 19 wells were installed by the Dairies in 2013 (Consent Order wells; identified as YVD-02, YVD-03, YVD-04, YVD-05, YVD-06, YVD-07, YVD-08, YVD-09, YVD-10, YVD-11, YVD-12, YVD-13, YVD-14R, YVD-15, YVD-16, YVD-17, YVD-18, DC-03D, and DC-05D), except for well YVD-14R, which is a replacement for well YVD-14, originally installed by the Dairies in 2013.

All wells are gauged on a quarterly basis to verify groundwater flow direction and to measure horizontal and vertical hydraulic gradients.

Sixteen of the wells are monitored quarterly and 10 of the wells are monitored on an annual basis to assess nitrate concentrations and groundwater chemistry in the surficial aquifer. As of Third Quarter 2019, upgradient monitoring well YVD-02 was moved from the annual schedule to the quarterly monitoring schedule due to elevated nitrate concentrations detected in that well in Second Quarter 2019. Beginning in Third Quarter 2020, quarterly sampling was resumed at well DC-07 due to elevated nitrate concentrations detected in that well during the Second Quarter 2020.

4.1 Groundwater Monitoring Quality Assurance Project Plan

In 2020, the Dairies operated under the updated Groundwater Monitoring QAPP (Anchor QEA 2018b), which was conditionally approved by EPA on February 28, 2018.

4.2 Well Installation and Maintenance

In 2020, no groundwater monitoring well installations or replacements were required.

Well YVD-02 has run dry. That well is seated in a shallow basalt layer and is located just downgradient of a former irrigation canal. Groundwater elevations decreased in this well following replacement of the open canal with an enclosed irrigation pipeline. The well subsequently ran dry and has not had sufficient water to allow sampling since Second Quarter 2020. That well is checked during each quarterly sampling event and will continue to be sampled if sufficient water is present.

4.2.1 Dedicated Bladder Pumps

In 2017, dedicated bladder pumps were installed in each groundwater well. During 2020, all bladder pumps remained operational, and no changes to the sampling methodology were required.

4.2.2 Monitoring Well Pressure Transducers

In 2013, pressure transducers were installed in six monitoring wells (DC-03, DC-05, DC-05D, YVD-03, YVD-08, and YVD-11) to supplement groundwater elevation data generated by hand- gauging activities conducted in all 26 Consent Order wells. The transducers collected water level data in 1-hour intervals. Five of the transducers are installed in wells screened in the shallow surficial aquifer; one transducer is installed in a well screened in a deeper zone of the surficial aquifer (DC-05D). The data obtained from the pressure transducer network provide additional information on short -term elevation changes, in addition to the long-term and seasonal trend data provided by the hand-gauging data.

Throughout 2020, the pressure transducers installed in each well remained operational. However, maintenance was required on the transducers in wells YVD-03, YVD-08, and DC-05, which resulted in intervals of lost data in some instances. Due to low battery power, the transducer data in YVD-03, YVD-08, and DC-05 could not be downloaded in First Quarter 2020, and the transducers were shipped to the manufacturer for data retrieval. All three transducers were replaced on May 8, 2020. On June 7, 2020, the cable suspending the transducer in YVD-03 broke, and the transducer fell to the bottom of the well. Attempts to recover the transducer were not successful. A replacement transducer was installed in the well on September 23, 2020. Transducer data are presented in the figures submitted in the 2020 quarterly groundwater monitoring data reports (Anchor QEA 2020v, 2020w, 2020x, 2021b). Hydrographs developed from corresponding manually measured groundwater elevation data are also provided in the appendices to those reports.

4.3 Quarterly Groundwater Monitoring Data Reports

Groundwater quarterly monitoring activities were performed as described in Section III.E of the SOW and consistent with the current Groundwater Monitoring QAPP (Anchor QEA 2018b). In 2020, quarterly groundwater monitoring events were conducted as follows:

- First Quarter 2020 – March 29 to April 1, 2020
- Second Quarter 2020 – June 7 to June 11, 2020

- Third Quarter 2020 ñ September 19 to September 21, 2020
- Fourth Quarter 2020 ñ December 6 to December 8, 2020

In 2020, quarterly groundwater monitoring data reports were submitted to EPA as follows:

- First Quarter 2020 Groundwater Monitoring Data Report Memorandum (Anchor QEA 2020v) ñ Submitted May 29, 2020
- Second Quarter 2020 Groundwater Monitoring Data Report Memorandum (Anchor QEA 2020w) ñ Submitted August 10, 2020
- Third Quarter 2020 Groundwater Monitoring Data Report Memorandum (Anchor QEA 2020x) ñ Submitted November 19, 2020
- Groundwater Monitoring Data Report ñ Fourth Quarter 2020 (Anchor QEA 2021b) ñ Submitted February 8, 2021

The quarterly groundwater monitoring data reports are included in Appendix B. Current and historical data are presented in the tables and figures of the quarterly reports and are also summarized in Section 4.4.

4.4 Summary of Findings

Historical groundwater chemistry data are presented in Table 4. Annual groundwater chemistry data for each well in 2020 are depicted in Figure 6 (nitrate concentrations), Figure 7 (nutrient concentrations), Figure 8 (anion concentrations), Figure 9 (metal concentrations), and Figure 10 (alkalinity [bicarbonate and carbonate] concentrations). A summary of groundwater elevations in the surficial aquifer through 2020 is included in Table 5. Surficial aquifer groundwater elevation contour maps for the four quarters in 2020 are presented in Figures 11a through 11d.

Time-series trend plots of nitrate concentrations in groundwater from the beginning of monitoring in 2013 through Fourth Quarter 2020 are presented in Figures 12 through 16.

The results of the 2020 groundwater monitoring include the following:

- Nitrate concentrations in four of the five northern wells (DC-09, YVD-05, YVD-06, and YVD-07) and three of the four upgradient wells (DC-01, YVD-03, and YVD-04) have remained below the nitrate MCL since Third Quarter 2016 and Second Quarter 2015, respectively.
- Nitrate concentrations have been consistently below the nitrate MCL in downgradient well YVD-17 since the beginning of the monit oring program.
- Nitrate concentrations above the MCL were detected in groundwater from well YVD-02 from Second Quarter 2019 through Second Quarter 2020 after 5 years of being less than 5 mg/L. YVD-02 is located on the upgradient edge of an irrigated manure application field. The well is screened in shallow bedrock (screened interval 15.0 to 34.5 feet below ground surface) and monitors only groundwater that is perched above or within the shallow bedrock. Prior to

2017, an open, unlined irrigation ditch was located on the adjacent upgradient side of the field. After the open ditch was replaced by a piped conveyance, groundwater elevations decreased in the well, and the well has been dry since Third Quarter 2020. EPA has concluded that the elimination of the ope n ditch eliminated a source of relatively clean water to the groundwater, unmasking nitrate contamination from the manured field to the groundwater. The George DeRuyter & Son Dairy has changed its field management practices by avoiding the application of any manure within 30 feet of the monitoring well to reduce nitrate loading from the field. If groundwater is detected in the well during future monitoring events, sampling of the well will continue at a quarterly frequency until the well groundwater nitrate concentrations drop below the MCL.

- Nitrate concentrations above the MCL were detected for the first time in the monitoring program in downgradient well DC-07 in Second Quarter 2020. In Fourth Quarter 2020, nitrate concentrations were 49% lower than in Third Quarter 2020 but remain above the MCL.
- Nitrate concentrations above the MCL were detected in well DC-14 in Second Quarter 2020 and remain above the MCL. These were the first detections above the MCL in this well since Second Quarter 2016.
- Ammonia and TKN were not detected above their respective method detection level (MDLs) in all sampled wells in 2020.
- There were three phosphorus detections equal to or greater than its MDL of 0.07 mg/L in three wells (DC-01, DC-04, and YVD-18) during 2020. None of the detected concentrations exceeded 0.16 mg/L.
- There was one nitrite detection of 4.38 mg/L in well YVD-02 in First Quarter 2020.

Groundwater in the surficial aquifer continues to flow in a northeast to southwest direction with little seasonal change in hydraulic gradient. In First through Third Quarters 2020, the average hydraulic gradient across the site was 0024 foot per foot , with an average of 0.047 foot per foot in the topographically higher area upgradient of the Dairies, 0.011 foot per foot in the central area of the site, and 0.0042 foot per foot in the topographically lower area downgradient of the Dairies. In Fourth Quarter 2020, upgradient well YVD-02 was dry, and the hydraulic gradient was calculated from well DC-01, resulting in an average hydraulic gradient across the site of 0.013 foot/foot and an average of 0.026 foot/foot in the topographically higher area upgradient of the Dairies.

Vertical gradients as measured at the three shallow/deep well pairs (DC-03/DC-03D, DC-05/DC-05D, and YVD-13/YVD-18) are generally consistently upward at well pair DC-03/DC-03D. Vertical gradients were downward at well pair YVD-13/YVD-18 in First Quarter 2020 and upward in Second through Fourth Quarters 2020. Vertical gradients were upward at well pair DC-05/DC-05D in First Quarter 2020 and downward in Second through Fourth Quarters 2020. The variable vertical gradients at these two well pairs may be caused by periodic pumping cycles from domestic and irrigation wells in the vicinity.

Groundwater in the surficial aquifer in the location of the Dairies is mainly calcium-bicarbonate type (approximately 75% of the wells), with calcium-sulfate-type water present in a few wells (approximately 25%). Groundwater in one well, YVD-09, is consistently no dominant type . This is consistent with analysis of groundwater quality from previous years of the groundwater monitoring program.

5 Actions to Ensure Effective Nutrient Management

Section III.F.1 and Section III.F.2 of the Consent Order SOW describe immediate nitrate source control actions. Per Section III.F.1, each Dairy must submit a Dairy Facility Application Field Management Plan (AFMP) to EPA and conduct preplant and post-harvest soil sampling, with the goal of reducing the soil nitrate level to below 45 parts per million (ppm) at the 2-foot depth. Per Section III.F.2, each Dairy must submit an Irrigation Water Management Plan (IWMP) to EPA and install flow meters and moisture sensors with the goal of minimizing water movement below the root zone.

In 2020, spring and fall nitrate concentrations in all application fields at Cow Palace Dairy and Liberty/H&S Bosma Dairies remained below the 45 ppm target at the 2-foot depth interval (12 to 24 inches). Nitrate concentrations were below the 45-ppm target in all of the George DeRuyter & Son/D&A Dairies fields except in fields GDS-SU04, GDS-SU05, and GDS-SU08 (Figure 17).

During 2020, soil moisture sensors installed in each of the manure application fields were repaired and upgraded to return them all to full operation. The Consent Order requires at least two moisture monitoring stations in each of the 34 fields, and some fields have three.

5.1 Application Fields

The use of an agronomic rate to guide nutrient applications continues to be the primary management tool for achieving the goal of reducing nitrate at the 2-foot depth in each application field to less than 45 ppm. To calculate an agronomic rate, dairy nutrient sources are evaluated (through sampling and analysis procedures described in the updated Dairy Facility AFMP [Anchor QEA 2018c]) for total nitrogen, which principally includes ammonium nitrogen, nitrate nitrogen, and organic nitrogen. Other potential sources of nutrients, such as organic matter, irrigation water, crop residue, and past manure applications, are established through sampling and calculation and accounted for in the calculation of an agronomic rate.

Following application, only a portion of the nitrogen measured in the dairy nutrient sources is available to the crop during the growing season. Available nitrogen is calculated using the nutrient source parameters. Residual soil nitrogen is measured by soil sampling and is a critical component of an agronomic rate. Due to variation in crop physiology and rooting depth, not all of the measured residual nitrogen within the soil will be available to the growing crop over the season. Therefore, some of the nitrogen is considered to be "positionally unavailable" or "not accessible."

As the crop develops, in-season adjustments are sometimes made using tissue samples (petioles) or soil samples. These samples can be taken to assess if current nutrient availability will be sufficient to meet crop needs to finish out the crop. If it is determined that additional nitrogen will be required to meet crop demand, then the initial agronomic rate is adjusted. An agronomic rate should not be considered to be an absolute maximum or minimum, as in-season dynamics can change. However, if

applications are made outside of these parameters, then documentation of the reasons for the change in rate are required.

Application field management summary and recommendation calculations for each Dairy are provided in Tables 6, 7, and 8. Manure nutrient contents measured for various liquid and solid manure sources for pre-plant and post-harvest are summarized for each Dairy in Tables 9a to 9d (Cow Palace Dairy), Tables 10a to 10d (Liberty/H&S Bosma Dairies), and Tables 11a to 11d (George DeRuyter & Son/D&A Dairies). Other nutrient management activities and results are further described for each Dairy in Sections 5.3, 5.4, and 5.5

5.2 Irrigation Water Management

Section III.F.2 of the Consent Order SOW requires that each Dairy must submit an IWMP to EPA and install flow meters and moisture sensors with the goal of minimizing water movement below the root zone.

As described in the IWMPs, at each Dairy, a system of data loggers and moisture sensors was installed within each field to help guide irrigation water applications with the goal of reducing the potential for the movement of water below the crop root zone. Figure 18 depicts an IWMP Conceptual Site Model (IES 2015a, 2015b, 2015c) that provides a simplified and general depiction of the forces and components involved within irrigated fields. However, it does not represent all the forces that can act on irrigation water within an irrigated system.

The Consent Order requires at least two soil moisture monitoring locations in each of the Dairies' 34 application fields. Each monitoring location, or "station," includes three sensors at different soil depths. Most fields have two sensor stations, and a some have three. The Dairies installed 82 moisture sensor stations in 2,303 acres of application fields, which on average is one station for every 28 acres. Table 12 summarizes the network of 82 irrigation sensor stations.

5.2.1 Sensor Installation and Maintenance

The maximum amount of water that is held in soil against the pull of gravity is referred to as the "field capacity" (NRCS 2017). The results of the field capacity testing and soil moisture monitoring station installation is described in the field capacity soil testing reports for irrigation water management (IES 2015a, 2015b, 2015c).

Agrimanagement completed testing in September and October 2014 to establish field capacities of application field soils. Pessl iMetos data loggers with Decagon moisture sensors were installed during November 2014. Separate sensors were installed at 1 foot below ground surface (bgs), 2 feet bgs, and 3 feet bgs. The moisture sensors measure the volumetric water content (VWC; water volume divided by soil volume). As shown on the example provided in Figure 19, the VWC at 1 foot bgs is

generally more variable during precipitation or irrigation compared to the VWC at 2 feet and 3 feet bgs. The VWC at 2 feet and 3 feet bgs is more gradual in response to the rainfall or irrigation event.

Data are collected from the moisture sensors on an hourly basis and transmitted up to four times per day via cell modem to a web application. These data are evaluated once per week and field-specific recommendations are provided. In the event field capacity is exceeded at the 3-foot depth, the web application sends a text notification to the professional irrigation consultant (Ag rimanagement) and to farm managers to notify them that field capacity has been exceeded.

During 2020, the Dairies conducted repairs and upgrades to fix soil moisture sensors that had been damaged during harvest operations or that were inoperable due to equipment malfunctions. By the end of 2020, repairs of all of the sensors at George DeRuyter & Son/D&A Dairies and Liberty/H&S Bosma Dairies were completed, and most repairs had been completed at Cow Palace Dairy. The remaining repairs at the Cow Palace Dairy were completed during January 2021.

5.2.2 Irrigation Monitoring Results

During 2020, the irrigation season extended from mid-April through mid- October. The weather experienced during the 2020 irrigation season was a little cooler than average to start the season in April through May. Typical conditions occurred in June through August, while late summer weather was well above average in temperature. Annual precipitation was down moderately from 2019 (5.31 inches) at 3.71 inches for the year. With more average temperatures, season-long evapotranspiration totals were average for 2020.

The Consent Order requires at least two moisture monitoring stations in each of the 34 fields (some fields have three). As noted in Section 5.2.1, moisture sensor stations were undergoing repairs and replacement during the irrigation season. Table 12 summarizes information regarding each sensor location, including instances when exceedances of field capacity were measured at the 3-foot soil depth. Observations include the following:

- All 34 application fields had at least one operable sensor station for all or part of the irrigation season.
- Seven of the 34 application fields had at least one exceedance of field capacity at the 3-foot soil depth, which is down from 14 fields in 2019. Several of these exceedances appeared to be related to wet spring soils that were unrelated to irrigation events.

The 2020 moisture sensor data are described in individual season summary site reports for each field and are included in Appendix C.[2,3,4]

5.3 Cow Palace Dairy Application Fields

In 2020, pre-plant and post-harvest soil sampling was conducted by Agrimanagement at the seven application fields associated with Cow Palace Dairy from May 5 to May 11, 2020 (preplant), and from October 7 to November 2, 2020 (post-harvest). Liquid and solid manure samples were collected on April 15, 2020 (pre-plant), and on September 8, 2020 (post-harvest). A summary of 2020 pre-plant and post-harvest data is provided in Table 13. For the entirety of the 2020 season, nitrate concentrations in all application fields associated with Cow Palace Dairy were below 45 ppm at the 2-foot depth.

Cow Palace Dairy manure nutrient concentrations for total nitrogen (N), total ammonium (NH4), total phosphorus (P), and total potassium (K) from 2013 to 2020 are provided in Tables 9a, 9b, 9c, and 9d.

5.3.1 Soil Nitrate Level Summary

In 2020, based on soil sampling results collected, nitrate concentrations at the 2-foot depth interval were all below 45 ppm for both the pre-plant and post-harvest samplings (Figure 20).

Cow Palace Dairy application field soil nitrate concentrations from 2013 to 2020 are provided in Table 14, and graphic depictions of these data are presented in Figures 21a through 21g. The number of application fields with nitrate levels exceeding 45 ppm in the second foot from 2013 to 2020 is depicted in Figure 22. Average post-harvest soil nitrate concentrations measured in the seven application fields associated with Cow Palace Dairy have generally decreased since 2013 (Figure 23).

5.3.2 Application Field Management

In 2020, in addition to agronomic rate, the following management tools and strategies were used toward achieving soil nitrate concentrations below 45 ppm at the 2-foot depth interval in application fields associated with Cow Palace Dairy:

- Improved application timing to better co incide with crop nutrient uptake
- In-season tissue and soil sampling to evaluate crop nutrient uptake progress

Overall, manure applications were well controlled, and as discussed in Section 5.3.1. All field nitrogen applications for 2020 were below the ranges recommended by Agrimanagement.

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[2] In the line graph of each application field season report, the line between the green shading and the blue shading is field capacity at the third foot (or the green is the favorable zone, red is below favorable, and blue is above favorable).

[3] In the bar graph of each application field season report, the blue data bars represent precipitation. Overlapping data bars may appear darker (blue versus dark blue). To clarify, all blue bars represent precipitation.

[4] Certain application field season reports include notes regarding sensor performance during the season.

5.3.3 Field Moisture Management

At Cow Palace Dairy there are a total of 17 sensor locations in seven fields. In 2020, as discussed in Section 5.2.1, functioning moisture sensor stations were repaired, replaced, and upgraded. However, as noted in Table 12 and Appendix C, some sensors were not functioning during part or all the irrigation season. As of January 22, 2021, all sensors have been repaired. The following is a summary based on available data:

- There were six field capacity exceedances observed at the 3-foot soil depth at station CP-SU01-2.
- There were two field capacity exceedances observed at the 3-foot soil depth at station CP-SU05-1.
- No field capacity exceedances were observed at the 3-foot soil depth in the remaining Cow Palace Dairy application fields.

In response to the field capacity exceedances noted in fields CP-SU01 and CP-SU05, water application to these fields was adjusted by turning the water off or by lengthening the time between planned applications until moisture levels decreased below field capacity. These adjustments resolved the issue.

5.4 Liberty/H&S Bosma Dairies Application Fields

Agrimanagement conducted soil testing at the 13 application fields associated with Liberty/H&S Bosma Dairies from April 30 to June 12, 2020 (pre-plant), and from September 16 to October 15, 2020 (post-harvest). Liquid and solid manure samples were collected on April 15, 2020 (pre-plant), and on September 8, 2020 (post-harvest). A summary of 2020 pre-plant and post-harvest data is provided in Table 15. For the entirety of the 2020 season, nitrate concentrations in all application fields associated with Liberty/H&S Bosma Dairies were below 45 ppm at the 2-foot depth.

Liberty Dairy manure nutrient concentrations for total N, total NH_4, total P, and total K from 2013 to 2020 are provided in Tables 10a, 10b, 10c, and 10d.

5.4.1 Soil Nitrate Level Summary

In 2020, based on soil sampling results collected, nitrate concentrations at the 2-foot depth interval were below 45 ppm for both the pre-plant and post-harvest samplings (Figure 24).

Liberty/H&S Bosma Dairies application field soil nitrate concentrations from 2013 to 2020 are provided in Table 16, and graphic depictions of these data are presented in Figures 25a through 25m. The number of application fields with nitrate levels exceeding 45 ppm in the second foot from 2013 to 2020 is depicted in Figure 26. Average post-harvest soil nitrate concentrations measured in the 13 application fields associated with Liberty/H&S Bosma Dairies decreased substantially after 2013,

reaching an apparent minimum in 2018 (Figure 27). From Fall 2013 to Fall 2020, nitrate concentrations have decreased by 71% in the first foot, 74% in the second foot, and 71% in the third foot. As discussed in Section 5.1, residual soil nitrogen measured in each field is an important element in the development of the agronomic rate for that field. The 2020 season was the fourth full year where the nitrate concentrations were consistently below 45 ppm at the 2-foot depth interval.

5.4.2 Application Field Management

In 2020, in addition to agronomic rate, the following management tools and strategies were used toward achieving and maintaining soil nitrate concentrations below 45 ppm at the 2-foot depth interval in application fields associated with Liberty/H&S Bosma Dairies:

- Improved application timing to better coincide with crop nutrient uptake
- In-season tissue and soil sampling to evaluate crop nutrient uptake progress
- Rotation changes to provide application flexibility as well as increased nutrient uptake
- During 2020 triticale crops in several fields were allowed to grow into the soft dough stage, which resulted in higher yields and nutrient uptake.

Overall, manure applications were well controlled, and soil sample concentrations for nitrate have continued to decrease or be maintained. All field manure applications for 2020 were within the acceptable recommendation ranges.

5.4.3 Field Moisture Management

At Liberty/H&S Bosma Dairy, there are a total of 30 sensor locations in 13 fields. In 2020, as discussed in Section 5.2.1, functioning moisture sensor stations were repaired, replaced, and upgraded. All irrigation sensors were repaired or replaced as of December 15, 2020. The following is a summary based on available data:

- There were six field capacity exceedances observed at the 3-foot soil depth at station LD-SU16-I-1.
- There was one field capacity exceedance observed at the 3-foot soil depth at station LD-SU17-I-2.
- There were no field capacity exceedances observed at the 3-foot soil depth at the remaining soil moisture monitoring stations.

Once exceedances were noted in fields LD-SU16 and LD-SU17, water application to these fields was adjusted by turning the water off or by lengthening the time between planned applications until moisture levels decreased below field capacity. These measures successfully resolved the issue

5.5 George DeRuyter & Son/D&A Dairies Application Fields

Soil sampling was conducted by Agrimanagement at the 14 application fields associated with George DeRuyter & Son/D&A Dairies, from April 29 to May 15, 2020 (pre-plant), and from October 1 to November 4, 2020 (post-harvest). Liquid and solid manure samples were collected on April 15, 2020 (pre-plant), and on September 8, 2020 (post-harvest). A summary of 2020 pre-plant and post-harvest data is provided in Table 17.

George DeRuyter & Son Dairy manure nutrient concentrations for total N, total NH_4, total P, and total K from 2013 to 2020 are provided in Tables 11a, 11b, 11c, and 11d.

5.5.1 Soil Nitrate Level Summary

In 2020, based on soil sampling results collected, nitrate concentrations at the 2-foot depth interval were below 45 ppm for both the pre-plant and post-harvest samplings on all fields except GDS-SU04, GDS-SU05, and GDS-SU08 (Figure 17).

George DeRuyter & Son/D&A Dairies application field soil nitrate concentrations from 2013 to 2020 are provided in Table 18, and graphic depictions of these data are presented in Figures 28a through 28n. The number of application fields with nitrate levels exceeding 45 ppm in the second foot from 2013 to 2020 is depicted in Figure 29. From Fall 2013 to Fall 2020, nitrate concentrations have decreased by 76% in the top foot, 75% in the second foot, and 65% in the third foot.

Trends for the four fields that exceeded the 45-ppm nitrate goal at least once during 2020 (Figure 30) are as follows:

- **Field GDS-SU04:** This field received emergency applications to prevent lagoon overtopping in 2019, which resulted in initial spring 2020 measurements exceeding the 45-ppm goal. The field was resampled during the spring 2020 event and the soil nitrate level was below 45 ppm at the 2-foot depth. Fall 2020 measurements remained below the 45-ppm goal.
- **Field GDS-SU05:** This field also received emergency applications to prevent lagoon overtopping in 2019, which resulted in initial spring 2020 measurements exceeding the 45-ppm goal. The field was resampled during the spring 2020 event and the soil nitrate level was below 45 ppm at the 2-foot depth. Results for fall 2020 showed a slight increase in the soil nitrate level, which exceeded the 45-ppm goal. This seems to be an anomaly and may result from the late season application and the unusual weather and smoke conditions during late summer.
- **Field GDS-SU08:** This field was below the 45-ppm goal during spring 2020 measurements. However, the fall 2020 measurements (70.3 ppm) exceeded the goal.

All three of these fields are subject to ongoing nutrient management and monitoring activities under the Consent Order and under parallel Washington State permit requirements.

5.5.2 Application Field Management

In 2020, in addition to agronomic rate, the following management tools and strategies were used toward achieving soil nitrate concentrations below 45 ppm at the 2-foot depth interval in application fields associated with George DeRuyter & Son/D&A Dairies:

- Improved application timing to better coincide with crop nutrient uptake
- In-season tissue and soil sampling to evaluate crop nutrient uptake progress
- Rotation changes to provide application flexibility

Fields GDS-SU05 and GDS-SU08 exceeded the 45-ppm nitrate target at the 2-foot soil depth in fall 2020 as described in Section 5.5.1. Agrimanagement is reviewing nutrient budgeting for these fields, and no manure applications will be made until the fields drop below the 45-ppm nitrate target.

5.5.3 Field Moisture Management

At George DeRuyter & Son/D&A Dairies, there are a total of 35 sensor locations in 14 fields. In 2020, as discussed in Section 5.2.1, functioning moisture sensor stations were repaired, replaced, and upgraded. However, as noted in Table 12 and Appendix C, some sensors were not functioning during part or all the irrigation season. As of December 15, 2020, all sensors have been repaired. The following is a summary based on available data:

- Field capacity exceedances were observed at the 3-foot depth in fields GDS-SU01, GDS-SU02 and GDS-SU-03.
- No field capacity exceedances were observed at the 3-foot depth in any of the remaining fields.

Once exceedances were noted in fields GDS-SU01, GDS-SU02, and GDS-SU03, water application to these fields was adjusted by turning the water off or by lengthening the time between planned applications until moisture levels decreased below field capacity.

5.6 Off-Site Transfers

Under Section III.F.7 of the SOW, the Dairies must endeavor to avoid transporting manure to locations where the nitrate concentrations in groundwater is known by the Dairies to currently exceed 10 mg/L. Application of manure on fields in such areas is allowed only if post-harvest soil sampling data indicate nitrate concentrations at the 2-foot depth are below the 45-ppm target.

The Dairies have access to current groundwater quality in areas within and within 1 mile downgradient of the Dairies. This knowledge is available near the existing Consent Order groundwater monitoring network and near the residential wells that were sampled in 2013 as described in Section 2 (Figure 3).

In 2020, a portion of the manure and composted manure from each Dairy was transferred off site for use as a nutrient supplement. Prior to transferring manure to off-site application fields within the 1-mile downgradient boundary of the Dairies , nutrient data were collected from these fields to monitor nutrient levels, therein mi nimizing the risk of nitrogen over -application in a manner that could potentially contribute to groundwater nitrate contamination. Compost from the Dairies was primarily transferred outside of the 1-mile downgradient boundary of the Dairies.

5.6.1 Off-Site Liquid Manure Transfers

In 2020, the Dairies applied liquid manure to off -site application fields to support crop production at the respective locations. Off-site applications of liquid manure totaled 15,193,272 gallons. These details are described in Tables 19, 20, and 21; locations are shown in Figure 31; and soil sample results are provided in Appendices D, E, and F.

The Dairies are continuing to optimize off-site tracking and nutrient monitoring with the goal of providing consistent collection of post-harvest soil samples from the 2-foot depth and avoiding over-application of liquid manure, which could potentially contribute to areas of existing groundwater nitrate contamination.

In 2020, off-site nutrient monitoring activities were conducted for off- site liquid manure transfers as follows:

- For Cow Palace Dairy, nutrient monitoring data were collected from 12 of 12 fields receiving liquid manure transfers from the Dairy. Each field receiving liquid manure applications exhibited nitrate concentrations at the 2-foot depth below the 45 -ppm target.
- For Liberty/H&S Bosma Dairies, nutrient monitoring data were collected from eight of eight fields receiving liquid manure transfers from the Dairies. Four fields receiving liquid manure applications exhibited nitrate concentrations at the 2-foot depth below the 45 -ppm target. The other four fields were sampled at the 1-foot depth onl y. Results at the 1-foot depth indicated nitrate concentrations ranging from 2.7 to 18.9 ppm.
- For George DeRuyter & Son/D&A Dairies, nutrient monitoring data were collected from 1 3 of 13 fields for which owners requested liquid manure transfers from the Dairies. Eight fields receiving liquid manure applications exhibited nitrate concentrations below the 45 -ppm target, including three fields sampled at the 2-foot depth and five fields sampled at the 1-foot depth only (results at the 1-foot depth ranged from 17.4 to 40.7 ppm N). Two fields exhibited nitrate concentrations above the 45-ppm target, and no manure transfers were made for these fields. Three manure transfers were conducted at fields that exceeded the 45 ppm

target (one field sampled at the 2-foot depth and two fields sampled at the 1-foot depth). These five fields are located outside of the 1-mile downgradient boundary of the Dairies.[5]

5.6.2 Off-Site Solid Manure Transfers

In 2020, off-site solid manure transfers included sales to agricultural users, as well as transfers to off-site compost manufacturers. Off-site transfers of solid manure totaled 1,445 tons (including both manure solids and unfinished compost). These details are described in Tables 2, 23, and 24; locations are shown in Figure 32. In 2020, off-site nutrient monitoring activities were conducted for off-site solid manure transfers as follows:

- For Cow Palace Dairy, no offsite solid manure transfers were conducted.
- For Liberty/H&S Bosma Dairies, no off-site solid manure transfers were conducted.
- For George DeRuyter & Son/D&A Dairies, off-site solid manure transfers were to locations outside the 1-mile downgradient boundary; therefore, nutrient monitoring activities were not required under the Consent Order.

5.6.3 Compost Production

The Dairies use much of their solid manure to produce organic compost. The compost is produced through windrow composting performed by the Dairies, as well as by third parties using on-site and off-site composting areas. The produced compost is a commercial product that is either used by the Dairies or sold as a soil amendment for horticultural use (i.e., landscaping, nurseries, and tree production) or agricultural use (including organic farming and other agricultural crop production) as a soil amendment.

During compost production, nitrogen in raw manure is transformed into more complex and stable humus-like organic matter, and odors, pathogens, weeds, and other unwanted materials that may be present in raw manure are greatly reduced or destroyed (DeLuca and DeLuca 1997; Rynk 1992). Moisture levels in raw manure are reduced during composting by approximately 50%, and approximately 30% to 60% of the readily available nitrogen volatizes (DeLuca and DeLuca 1997). Compared to the application of raw manure and inorganic fertilizers, the application of composted manure results in reduced risks of nitrogen leaching to infiltrating water. Although site-specific reasons vary, generally the primary reasons for this are as follows: 1) the reduction in total nitrogen content during composting; 2) conversion of the nitrogen to more complex and stable forms that are released in the subsurface at a slower and a more consistent rate; and 3) increase in the humus and organic matter content of the soil of the application field, improving both the ability of the soils to sequester nitrogen and regulate moisture content.

[5] Off-site applications were performed by the landowner and exact quantities applied to each field are unavailable.

Most of the compost produced from solid manure generated by the Dairies is used in areas beyond the 1-mile downgradient boundary. Approximately 79,297 tons of finished compost produced from manure solids generated by the Dairies was sold for off-site use (this represents about 158,595 tons of wet manure solids prior to moisture and solids losses occurring during the compost process). Of this quantity, about 6,660 tons (approximately 8%) was used within the 1-mile downgradient boundary. The majority (approximately 92%) was used outside of the 1-mile downgradient boundary, and approximately 65% was used outside of Yakima County.

During 2020, finished compost was shipped by the Dairies to two properties located within the 1-mile downgradient boundary. Transfer quantity and location details are described in Table 25 and Figure 33. The Dairies are unaware of any data indicating these shipments were to a location where nitrate concentrations in groundwater exceeded 10 mg/L.

The most developed markets for organic compost produced from the Dairies' manure solids currently include horticulture/landscape uses, production of organic root crops (typically not grown in the Sunnyside/Yakima area), organic fruit-tree growing (principally apples), and organic viticulture. Organic compost is relatively expensive in comparison to the cost of traditional chemical fertilizers and some other compost products that are higher in nitrogen levels (e.g., composted chicken manure). However, markets for organic compost continue to emerge as both organic and traditional growers gain experience with compost application and as the benefits of the compost amendment to crop production and soil conservation are documented in the agricultural community.

6 Other Reports, Plans, and Actions

6.1 Annual Reports

In 2020, the Dairies submitted the following documents related to annual reporting:

- 2019 Annual Report (Anchor QEA 2020) – Submitted March 10, 2020, and resubmitted September 1, 2020

Also in 2020, the following documents related to annual reporting were approved by EPA:

- 2018 Annual Report (Anchor QEA 2019b) – Approved February 6, 2020 (EPA Letter 218)
- 2019 Annual Report (Anchor QEA 2020) – Approved September 17, 2020 with edits from EPA (EPA Letter 228)

6.2 Quality Assurance Project Plans

Per Section III.A of the SOW, the Dairies must submit to EPA a QAPP prior to commencing any monitoring, sampling, field measurements, or laboratory sample analyses.

Each QAPP is prepared in accordance with Guidance for QAPPs (EPA 2001) and EPA Requirements for QAPPs (EPA 2002), as well as applicable amendments. The project data quality objectives are developed for use in the QAPP in accordance with Guidance on Systematic Planning Using the Data Quality Objectives Process (EPA 2006).

In 2020, there were no updates to project QAPPs

6.3 Health and Safety Plan

Per Section III.B of the SOW, the Dairies must submit to EPA a health and safety plan (HASP) at least 14 days in advance of initial field work for each task.

Each HASP is compliant with the Occupational Safety and Health Act and its implementing regulations. The HASP will be updated periodically, as applicable, to address changes in work or field activities. The current HASP (Anchor QEA 2016b) was submitted to EPA on September 13, 2016.

In 2020, there were no loss time injuries or recordable incidents. The following activities were performed regarding the current HASP:

- COVID-19 protocols were appended to the existing Health and Safety Plan, Yakima Valley Dairies (Anchor QEA 2016b).

6.4 Public Involvement

Per Section III.C of the SOW, the Dairies must notify EPA of their interest in participating in the public involvement process within 30 days of the effective date of the Consent Order. On April 18, 2013, the Dairies notified EPA of their interest in participating in the public involvement process.

In 2020, no public involvement activities were performed.

7 References

Anchor QEA (Anchor QEA, LLC), 2016a. Modified Lagoon Work Plan. Prepared for Liberty and H&S Bosma Dairies. November 2016.

Anchor QEA, 2016b. Health and Safety Plan, Yakima Valley Dairies. Prepared for the U.S. Environmental Protection Agency, Region 10. September 2016.

Anchor QEA, 2017a. Lagoon Pre-Design Data Collection Quality Assurance Project Plan, Liberty and H&S Bosma Dairies. Prepared for Liberty/H&S Bosma Dairies. February 2, 2017.

Anchor QEA, 2017b. 2016 Annual Report. Prepared for Yakima Valley Dairies. March 1, 2017.

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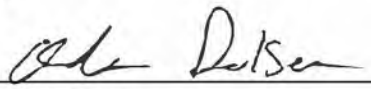
8 Certifications

Cow Palace Dairy Certification

I certify under the penalty of law that this document and attachments were prepared by me or under my direction or supervision in accordance with a system designed to assure that qualified personnel gathered and evaluated the information submitted. Based on my inquiry of any and persons directly responsible for gathering and analyzing the information obtained, I certify that the information contained in or accompanying this submittal is to the best of my knowledge and belief, true, accurate, and complete. As to those identified portion(s) of this submittal for which I cannot personally verify the accuracy, I certify that this submittal and attachments were prepared in accordance with procedures designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those directly responsible for gathering the information, or the immediate supervisor of such person(s), the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

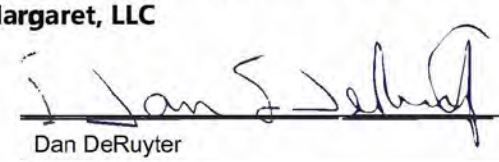
Cow Palace, LLC

Signature	
Name	Adam Dolsen
Title	Member
Date	2-16-21

George DeRuyter & Son Dairy, D&A Dairy, and George & Margaret Certification

I certify under the penalty of law that this document and attachments were prepared by me or under my direction or supervision in accordance with a system designed to assure that qualified personnel gathered and evaluated the information submitted. Based on my inquiry of any and persons directly responsible for gathering and analyzing the information obtained, I certify that the information contained in or accompanying this submittal is to the best of my knowledge and belief, true, accurate, and complete. As to those identified portion(s) of this submittal for which I cannot personally verify the accuracy, I certify that this submittal and attachments were prepared in accordance with procedures designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those directly responsible for gathering the information, or the immediate supervisor of such person(s), the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

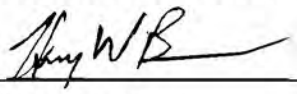
George DeRuyter & Son Dairy, LLC, D&A Dairy, LLC (also known as D and A Dairy, L.L.C.), and George & Margaret, LLC

Signature	
Name	Dan DeRuyter
Title	Member
Date	2/16/2021

Liberty Dairy Certification

I certify under the penalty of law that this document and attachments were prepared by me or under my direction or supervision in accordance with a system designed to assure that qualified personnel gathered and evaluated the information submitted. Based on my inquiry of any and persons directly responsible for gathering and analyzing the information obtained, I certify that the information contained in or accompanying this submittal is to t he best of my knowledge and belief, true, accurate, and complete. As to those identified portion(s) of this submittal for which I cannot personally verify the accuracy, I certify that this submittal and attachments were prepared in accordance with procedures designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those directly responsible for gathering the information, or the immediate supe rvisor of such person(s), the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonme nt for knowing violations.

Liberty Dairy, LLC (and its associated dairy facility H&S Bosma Dairy)

Signature	
Name	Henry Bosma
Title	Partner
Date	2-16-2021

Lagoon Inspection Form

Lagoon 1

Inspection Date: 6/26/20'

Inspector Signature: Jordan Hale

Inspection Checklist

Sump Liquid Level (inches) 22.1"-23.1"

Total Pump Starts 454 * Initial Start-up had leak. Drained and repaired.

Total Gallons Pumped -16' from overflow

Lagoon Depth (feet) 122,051

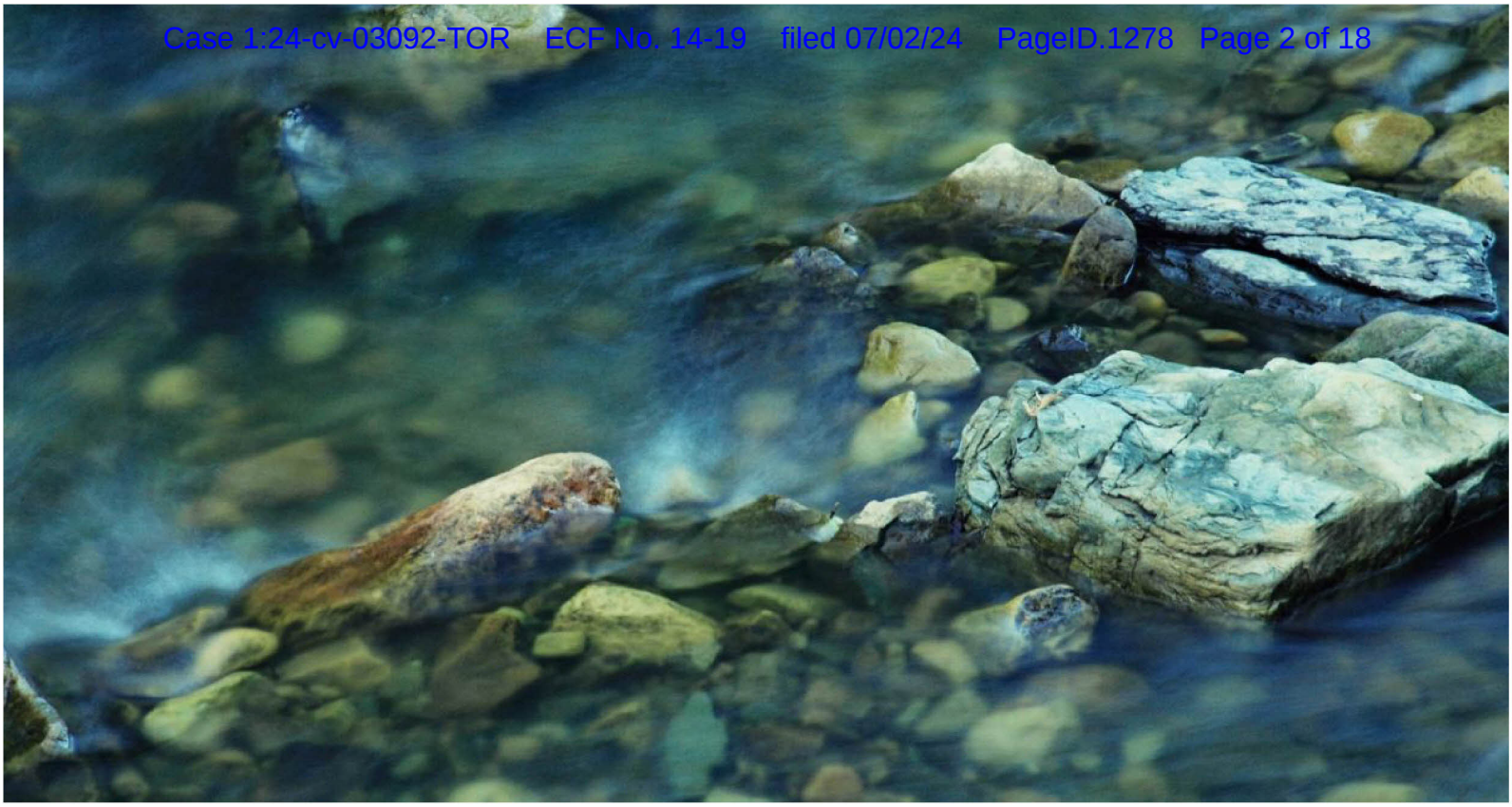
Site Perimeter ☑ Good.

Inlets/Outlets ☑

Embankment Condition / Notes ☑

(Check for wet areas, seepage, slides, erosion, trees, brush, animal burrows, undermining, liner cracks, sinkholes etc..)

Eric Winiecki Declaration
Exhibit S



Revised November 24, 2021
Cow Palace Dairy Lagoon No. 1 and Safety Debris Catch Basin
Administrative Order on Consent Docket No. SDWA-10-2013-0080

ANCHOR QEA

Cow Palace Dairy Lagoon No. 1 and Safety Debris Catch Basin Completion Report

Prepared for Cow Palace, LLC

November 24, 2021

Cow Palace Dairy Lagoon No. 1 and Safety Debris Catch Basin
Administrative Order on Consent Docket No. SDWA-10-2013-0080

Cow Palace Dairy Lagoon No. 1 and Safety Debris Catch Basin Completion Report

Prepared for
Cow Palace, LLC
1631 North Liberty Road
Granger, Washington 98932

Prepared by
Anchor QEA, LLC
1119 Pacific Avenue, Suite 1600
Tacoma, Washington 98402

Revised by[1]
Landau Associates, Inc.
2107 South C Street
Tacoma, Washington 98402

[1] Revised text in dark blue font color. Original text in black font color.

Project Number: 190996-01.01
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TABLE OF CONTENTS

1 Introduction 1

1.1 Site Description 2

2 Summary of Construction 3

2.1 Initial Preparation and Grading of Lagoon 3

2.2 Subgrade Preparation 3

2.3 Anchor Trench Excavation 4

2.4 Inlet and Outlet Piping 4

2.5 Liner System Installation 4

2.5.1 Geotextile Fabric 5

2.5.2 Geocomposite Gas Vent Strips 5

2.5.3 Flexible Membrane Liner – Drain Liner (i.e., Secondary Liner) 5

2.5.4 Flexible Membrane Liner – Primary Liner 6

2.5.5 Leak Detection and Collection System 6

2.6 Barrier System 6

2.7 Wind-Blown Secondary Liner Event 6

2.8 Primary Liner Repairs 7

3 Summary 9

4 References 10

5 Certification 12

Cow Palace Dairy, LLC, Certification 12

TABLE

Table 1 Lagoon No. 1 Sump Inspections 8

Table 2 Lagoon Capacities 9

FIGURE

Figure 1 Cow Palace Dairy Lagoon Map

APPENDICES

Appendix A Construction Quality Assurance Firm Report

Appendix B As-Built Drawings

Appendix C Daily Construction Quality Assurance Reports from November 23, 2019 through December 17, 2019

ABBREVIATIONS

Contractor	Hilmes Construction, Inc.
CQA	construction quality assurance
CQA Firm	Peak GeoSolutions
CQC/CQA	construction quality control
Dairy	Cow Palace Dairy, LLC
EPA	U.S. Environmental Protection Agency
FML	flexible membrane liner
HDPE	high-density polyethylene
LAI	Landau Associates, Inc.
mil	millimeter
NWL	Northwest Linings & Geotextile Products, Inc.
oz	ounce per square yard
PVC	polyvinyl chloride
QA	quality assurance
Report	*Cow Palace Dairy Lagoon No. 1 and Safety Debris Catch Basin Completion Report*
SDCB	Safety Debris Catch Basin

1 Introduction

This *Cow Palace Dairy Lagoon No. 1 and Safety Debris Catch Basin Completion Report* (Report) was prepared by Anchor QEA, LLC, on behalf of Cow Palace Dairy, LLC (herein referred to as the "Dairy"), as required by the U.S. Environmental Protection Agency (EPA) Region 10 Administrative Order on Consent SDWA-10-2013-0080. Under the Administrative Order on Consent, the Dairy was required to line Lagoon No. 1 and the Safety Debris Catch Basin (SDCB). The original report was submitted to EPA on March 31, 2020 (Anchor 2020). EPA comments on the original report were received 575 days later on October 27, 2021 (EPA 2021). In its comments, EPA requested revision and resubmittal of the original report no more than 28 days later on November 24, 2021. Revisions have been made by Landau Associates, Inc. (LAI) to address the EPA's comments pertaining to Lagoon No. 1 primary and secondary liner repairs. Revisions are shown in this Report body with a blue font color, and a new Appendix C was added to incorporate daily construction quality assurance forms; no edits to revisions were made to other appendices.

In March 2018, the Dairy submitted 90 percent lagoon lining design documents for Lagoon No. 1, and on April 19, 2018 EPA approved the 90 percent design as the 100 percent design in Letter No. 167 (EPA 2018a). On May 30, 2018 the EPA granted approval to adjust the schedule for the Dairy's lagoon programs to expedite lining the northeast Catch Basin and defer lining of Lagoon No. 1 to 2019 (EPA 2018b). Construction of the lining at Lagoon No. 1 also required permits from the Washington State Department of Ecology Dam Safety Office (DSO). Permit submittals included a hydraulic engineering report with downstream flood analysis; engineered construction drawings and technical specifications; a construction inspection plan; an emergency action plan; and an operations, maintenance, and monitoring plan. Final approval of permit submittals and a DSO permit were issued on September 6, 2019.

The purpose of this Report is to provide a detailed description of Lagoon No. 1 work conducted in accordance with the DSO-approved *Construction Drawings* (Anchor QEA 2019a), *Technical Specifications* (WET 2017),[2] *Addendum Number 1* (Anchor QEA 2019d), and *Cow Palace Lagoon 1 Construction Inspection Plan* (Anchor QEA 2019e),[3] as well as the EPA-approved *Quality Assurance and Quality Control Manual* (WET 2018a) and *Design Basis, Cow Palace, Lagoon 1* (WET 2018b).

This Report also provides a detailed description of work pertaining to the SDCB conducted in accordance with the EPA-approved *Construction Drawings* (Anchor QEA 2019b), *Technical*

[2] The Technical Specifications (WET 2017) were prepared for Lagoon No. 2 and approved by the EPA on April 11, 2017. Addendum Number 1 (Anchor QEA 2019d) served as an administrative update to the technical specifications so they could be applied to Lagoon No. 1 (i.e., updating project description, adding bid forms, updating payment obligations, etc.). No major technical modifications were made to the EPA-approved specifications.

[3] The *Cow Palace Lagoon 1 Construction Inspection Plan* (Anchor QEA 2019e) mirrors the Safety Debris Catch Basin Construction Quality Assurance Plan included in the EPA-approved *Cow Palace Safety Debris Catch Basin Basis of Design Report* (Anchor QEA 2019f); differences are superficial in nature (i.e., project title and description).

Specifications (Anchor QEA 2019c), and *Cow Palace Safety Debris Catch Basin Basis of Design Report* (Anchor QEA 2019f).

This Report details the construction activities, discusses the final as-built conditions, and documents the results of the construction quality control/construction quality assurance (CQC/CQA) program.

1.1 Site Description

The Lagoon No. 1 and the SDCB are located at the Cow Palace Dairy (1631 North Liberty Road, Granger, Washington), south of the Dairy's main operation (Figure 1). Waste management operations at Lagoon No. 1 will include collection and storage. Lagoon No. 1 will receive liquid manure from lagoons to the north and the SDCB and store the liquid manure until it can be used to fertilize crops. The SDCB will serve as an emergency overflow basin that will be utilized in extreme precipitation events or equipment failure. A concrete sump adjacent to the SDCB will normally collect wastewater flows and will pump directly to Lagoon No. 1, bypassing the SDCB. During large precipitation events or pump failure, flows from the concrete sump will overflow to the SDCB. Wastewater collected in the SDCB will be pumped to Lagoon No. 1 for storage.

The current project included lining Lagoon No. 1 and the SDCB. A pumping system (an agitator on a floating pontoon) will be used to convey the liquid manure from the SDCB to Lagoon No. 1 and from Lagoon No. 1 to the irrigation system.

2 Summary of Construction

This section describes the construction activities undertaken to regrade and line the existing Lagoon No. 1 and the SDCB. The activities conducted as part of the lining each lagoon are listed as follows in chronological order:

- Initial lagoon preparation, excavation, and grading
- Subgrade preparation
- Anchor trench excavation
- Inlet pipe installation
- Leak detection system installation
- Liner system installation and testing

The construction was completed by Hilmes Construction, Inc., from Moses Lake, Washington (Contractor), and Northwest Linings & Geotextile Products, Inc., (NWL) subcontracted to the Contractor. General construction oversight and CQA was conducted by Anchor QEA. Specialized CQA—specifically for compaction testing, subgrade compliance, and geosynthetic installation—was conducted by Peak GeoSolutions (CQA Firm), subcontracted to Anchor QEA.

2.1 Initial Preparation and Grading of Lagoon

Prior to the mobilization of the Contractor, the lagoons were taken out of service, and Dairy personnel performed liquid and solid removal activities. Liquid and solid manure was removed from the existing lagoons using standard earthmoving equipment (i.e., dozer and excavator). Manure solids were either relocated to the composting area or placed in an area that drained to another lagoon.

2.2 Subgrade Preparation

The Contractor mobilized to the site on September 23, 2019, and its work began with construction staking. Mass excavation and rough grading was then conducted to achieve the general configuration of the designed side slopes, lagoon bottom, and embankment conditions, followed by subgrade preparation. In general, the excavated soil generated through rough grading was suitable for use as on-site fill material and was used during the final grading process. A sample of the on-site fill material was collected by the CQA Firm and sent to an independent third-party material testing firm to determine moisture curves to be used during the on-site compaction testing. Results of the laboratory analysis are included in Appendix A.

During grading operations, the on-site fill material was scarified, moisture-conditioned, and compacted in 12-inch lifts using a vibratory drum roller. Compaction testing was performed on the lifts by the CQA Firm at various locations on the lagoon bottom and along the slopes to verify that fill areas were compacted to a minimum of 95% of the maximum dry density and within 2% of the

optimum moisture content as determined using the Modified Proctor (ASTM International D1557). In addition, the subgrade was proof-rolled with drum rollers to verify the subgrade was in non-yielding conditions (i.e., no evidence of "pumping"). Results of the compaction testing by Anchor QEA's third-party CQA Firm are included in Appendix A.

The final subgrade elevations are shown in the as-built drawings included in Appendix B.

2.3 Anchor Trench Excavation

Upon completion of the final subgrade grading, an anchor trench was excavated at the top of the lagoon embankment to secure the liner system. The anchor trench was located approximately 2 feet above the maximum operating level with dimensions meeting Washington State Natural Resources Conservation Service standards of between 18 and 24 inches deep, 12 and 24 inches wide, and approximately 3 feet from the top of the slope.

2.4 Inlet and Outlet Piping

All but one existing polyvinyl chloride (PVC) inlet pipe at Lagoon No. 1 and one inlet pipe at the SDCB were removed or abandoned. A new 10-inch high-density polyethylene (HDPE) inlet pipe was installed at the northern end of Lagoon No. 1, and a new 18-inch HDPE inlet pipe was installed at the eastern side of the SDCB from the concrete collection sump. Pipe connections installed to join the newly installed HDPE pipe to existing PVC pipes were joined by couplers.

The final as-built locations and inverts of the installed pipes are shown in the project as-built drawings (Appendix B).

2.5 Liner System Installation

The liner systems at Lagoon No. 1 and the SDCB were installed between November 18, 2019, and January 24, 2020, and consisted of the following components:

- Prepared subgrade
- 10-ounce-per-square-yard (oz) non-woven geotextile
- Geocomposite gas vent and HDPE cover strips
- Flexible membrane liner (FML) consisting of 50-millimeter (mil) HDPE (drain liner or secondary liner)
- FML consisting of 60-mil textured HDPE (primary liner)

Prior to installation of the liner system components, various quality assurance (QA) activities were conducted, including but not limited to the following:

- The material product data was reviewed by the CQA Firm to confirm compliance with the *Technical Specifications* (WET 2017).

- Manufacturer quality control testing of the manufactured rolls was reviewed.
- After the geosynthetics arrived on site, the roll numbers were checked against the shipping papers to confirm that the rolls present matched the reviewed rolls.
- Additional QA samples were cut from the delivered liners and sent to a third-party material testing firm.

Further discussion on the QA measures listed in this section, as well as results of the third-party material testing, are included in the CQA Firm's report (Appendix A).

2.5.1 Geotextile Fabric

Following subgrade preparation and testing, a 10-oz geotextile fabric was placed directly on the prepared subgrade. The geotextile serves as a cushion layer to protect the HDPE drain liner FML from the larger subgrade aggregate and improve the contact interface between the FML and the lagoon slopes.

2.5.2 Geocomposite Gas Vent Strips

For gas ventilation purposes, a network of 4-foot-wide (minimum), 200-mil geocomposite gas vent strips were placed directly on top of the 10-oz non-woven geotextile. The geocomposite gas vent strips consist of an HDPE drainage net laminated to a non-woven geotextile. The strips were installed with the non-woven geotextile facing the subgrade.

Further documentation of the gas ventilation system installation, as well as the CQA methods and tests conducted, are included as part of CQA Firm's report (Appendix A).

2.5.3 Flexible Membrane Liner – Drain Liner (i.e., Secondary Liner)

Following the installation of the gas venting components, a 50-mil HDPE FML drain liner was installed using a forklift with a spreader bar attachment. The drain liner is manufactured with 130-mil studs fully integrated into the FML that promote drainage to the leak detection sump in the event of a leak in the primary liner. The drain liner was placed with the studded side up directly over the geotextile. The panels were seamed together utilizing an automated welding apparatus to conduct a double-wedge fusion weld. At the inlet pipe penetration, the Contractor encapsulated the pipe with a pipe sleeve constructed of the same material as the HDPE primary liner. Once secured, the Contractor's liner installer welded a continuous extrusion weld along the perimeter of the skirt at the location where the skirt and sleeve meet and at the location where the pipe and the sleeve meet.

Further documentation of the drain liner installation, as well as the CQA methods and tests conducted (including the results of destructive and nondestructive seam testing and documented repairs), are included as part of CQA Firm's report (Appendix A).

2.5.4 *Flexible Membrane Liner – Primary Liner*

The primary FML consists of a 60-mil textured HDPE geomembrane. The primary liner was placed with the textured side down directly over the drain liner. The panels were seamed together utilizing an automated welding apparatus to conduct a double-wedge fusion weld. At the inlet pipe penetration, the Contractor encapsulated the pipe with a second pipe sleeve constructed of the same material as the HDPE primary liner. Once secured, the Contractor's liner installer welded a continuous extrusion weld along the perimeter of the skirt at the location where the skirt and sleeve meet and at the location where the pipe and the sleeve meet.

Further documentation of the FML installation, as well as the CQA methods and tests conducted (including the results of destructive and nondestructive seam testing and documented repairs), are included as part of CQA Firm's report (Appendix A).

2.5.5 *Leak Detection and Collection System*

Any leakage passing the primary liner will be directed through the drain liner to the leak detection/collection sump located in the southwest corner of Lagoon No. 1 and the northwest corner of the SDCB. The collection sump consists of a depression in the bottom of the lagoon with washed rock and a riser conduit that houses a slope riser sump pump. The sump and pump serve as a leak detection and collection system. The pump will operate on a transducer and will pump any leachate back into the lagoon via a 1-inch HDPE discharge pipe. A flow meter attached to the discharge line collects and stores pumping times and rates to assess leakage rates.

2.6 Barrier System

Installation of a barrier system for Lagoon No. 1 and the SDCB will be performed by the Dairy and may consist of Jersey barrier blocks with a pole-and-wire system, fencing, or other barrier that will deter access to the lagoons by unauthorized personnel, vehicles, and animals.

2.7 Wind-Blown Secondary Liner Event

On or about November 28, 2019 (Thanksgiving) the completely installed Lagoon No. 1 secondary liner was blown out of place and damaged by high winds. The EPA was notified of the wind-blown damage during the initial submittal of this Report on March 31, 2020. In accordance with the technical specifications (WET 2018a), the geomembrane was deployed between November 19 and November 25, 2019. The technical specifications call for the use of sandbags or equivalent ballast as necessary to temporarily hold the geomembrane material in position under foreseeable and reasonably expected wind conditions. LAI was unable to verify if ballast was or was not put in place. The highest recorded winds during the storm were recorded at Sunnyside, Washington at 53 miles per hour on Wednesday, November 27, 2019 (Donald W. Meyers 2019).

Excessively high winds caused existing seams from the secondary liner panel numbers 33, 34, and 35 to fail, and the installed liner was ripped in two from east to west by the wind, resulting in a 350-foot tear in the center of the lagoon's secondary liner. Several other smaller tears throughout the secondary liner were caused due to wind damage. Because damaged areas could be repaired efficiently and effectively with patches or weld caps, the wind-blown liner was restored and repaired rather than replaced over the next eight days between November 29 and December 6, 2019. Minor tears were patched, the 350-foot tear was repaired with a cap strip, and the liner was cut and repaired with extrusion welds or cap strips in several places to remove wrinkles. Although the as-built drawings show an approximately 25-foot section in the middle of the 350-foot tear that was not patched, the cap strip did span the entire length of the seam.

During the secondary liner repairs, the CQA monitor verified welding surfaces were cleaned and free of moisture, dust, dirt, and debris prior to and during welding operations. All existing seams that were repaired were re-tested with a vacuum box and passed the re-test, as documented in the Repair Logs presented in Appendix A. Existing seams that were visually observed to be uncompromised were not repaired or re-tested; no such re-testing requirement exists in the technical specifications (WET 2018a). A series of photographs showing the results of the wind-blown event and operations to restore the secondary liner installation are presented in Appendix A. Efforts to restore the secondary liner were monitored by the CQA Firm and documented in Daily CQA Reports (Appendix C), and executed repairs are verified on standard Repair Logs presented in Appendix A. The restored secondary liner installation was re-examined, re-inspected, and cleared by the CQA Firm for the overlying primary geomembrane installation on December 6, 2019.

2.8 Primary Liner Repairs

A leak was detected in the Lagoon No. 1 primary liner upon startup in February 2020, and routinely monitored by Dairy personnel until repairs could be completed. Leaking lagoon water was captured in the leak detection sump, as designed, and pumped back into the lagoon. On April 22, 2020 the lagoon was pumped down to a height of approximately 3 feet. On May 5, 2020, NWL performed a visual inspection of all exposed primary liner areas. Three seams were found to be damaged adjacent to the sump and were repaired with extrusion-welded patches and then vacuum-box tested. The secondary liner was not compromised. Following repairs, Lagoon No. 1 was returned to service and no additional leachate production has been observed since that time.

Table 1 depicts volumetric measurements of the amount of liquid collected in the Lagoon No. 1 sump from February 2020 through October 2021.

Table 1
Lagoon No. 1 Sump Inspections

Inspection Date	Sump Liquid Level (inches)
2/19/20 [a]	0
3/4/20 [a]	15
3/11/20 [a]	20
4/15/20 [a]	20
4/22/20 [a]	1
5/5/20 [a]	22
6/26/20	22.1 – 23.1
7/29/20	24.6 – 26.1
8/17/20	24.6
9/14/20	25
10/15/20	25
11/9/20	25.8
12/14/20	23.5
1/18/21	24.2
2/26/21	25.1
4/3/21	24.3
5/10/21	24.5
6/15/21	24.5
7/23/21	26
8/31/21	25.3
9/27/21	25
10/30/21	22.8

Notes:
a) Monthly inspection form was completed in June 2021 based on a review of historical notes and records.

3 Summary

Construction and lining of Lagoon No. 1 and the SDCB is complete. As shown in the as-built drawings (Appendix B), the completed Lagoon No. 1 is approximately 450 feet long (as measured north to south) and 320 feet wide (as measured from east to west), with an approximate operating level depth of 26.5 feet and an approximate freeboard of 2 feet. The completed SDCB is approximately 150 feet long (as measured north to south) and 130 feet wide (as measured from east to west), with an approximate operating level depth of 10 feet and an approximate freeboard of 2 feet.

The lagoon capacities are shown in Appendix B and Table 2.

Table 2
Lagoon Capacities

Lagoon	Operating Condition	Estimated Finished Capacity		Estimated Pre-Construction Capacity	
		Million Gallons	Acre-Feet	Million Gallons	Acre-Feet
Lagoon No. 1	Maximum	15.8	48.4	15.3	47.0
	Operational	13.8	42.4	13.4	41.0
	Impounded Volume	9.5	29.2	10.0	30.5
SDCB	Maximum	0.9	2.9	1.7	5.3
	Operational	0.7	2.2	1.3	4.0

Note:
Capacities were estimated using survey data in Autodesk Civil 3-D software.

4 References

Anchor QEA (Anchor QEA, LLC), 2019a. *Construction Drawings*. Cow Palace Lagoon No. 1. Prepared for Cow Palace Dairy, LLC. August 28, 2019.

Anchor QEA, 2019b. *Construction Drawings*. Cow Palace Safety Debris Catch Basin. Prepared for Cow Palace Dairy, LLC. July 2019.

Anchor QEA, 2019c. *Technical Specifications*. Cow Place Safety Debris Catch Basin. Prepared for Cow Palace Dairy, LLC. June 2019.

Anchor QEA, 2019d. *Addendum Number 1*. Cow Place Lagoon No. 1. Prepared for Cow Palace Dairy, LLC. April 24, 2019.

Anchor QEA, 2019e. *Cow Palace Lagoon 1 Construction Inspection Plan*. Prepared for Cow Palace, LLC. August 9, 2019.

Anchor QEA, 2019f. *Cow Palace Safety Debris Catch Basin Basis of Design Report*. Prepared for Cow Palace Dairy, LLC. July 15, 2019.

Anchor. 2020. Final: Cow Palace Dairy Lagoon No. 1 and Safety Debris Catch Basin Completion Report. Anchor QEA, LLC. March 31.

Donald W. Meyers. 2019. Yakima continues to recover from pre-Thanksgiving gale-force wind storm. *Yakima Herald-Republic*. November 30.

EPA. 2018a. Letter: Approval of 100 Percent Design for lagoon 1, Cow Palace Dairy ("Respondent"); Administrative Order on Consenet ("Consent Order"); Docket No. SDWA-10-2013-0080; Yakima Valley Dairies, Washington. From Eric Winiecki, to Water & Environmental Technologies. April 19.

EPA. 2018b. Letter: Lagoon Lining Schedule, Cow Palace Dairy; Administrative Order on Consent ("Consent Order"); Docket No. SDWA-10-2013-0080; Yakima Valley Dairies, Washington. From Eric Winiecki, to Cow Palace Dairy. May 30.

EPA. 2021. Letter: Cow Palace Dairy Lagoon 1 Closure Report; Administrative Order on Consent ("Consent Order") Docket No. SDWA - 10-2013-0080; Yakima Valley Dairies, Washington. From Eric Winiecki, to Landau Associates, Inc. October 27.

WET (Water & Environmental Technologies, LLC), 2017. *Technical Specifications*. Lagoon No. 2. Prepared for Cow Palace Dairy, LLC. April 11, 2017.

WET, 2018a. *Cow Palace Dairy Facility Installation Quality Assurance and Quality Control Manual. Facilities Covered: Lagoon 1*. Prepared for Cow Palace Dairy, Inc. April 18, 2018.

WET, 2018b. *Design Basis, Cow Palace, Lagoon 1*. Prepared for Cow Palace Dairy, LLC. April 19, 2018.

5 Certification

Cow Palace Dairy, LLC, Certification

I certify under the penalty of law that this document and all attachments were prepared by me or under my direction or supervision in accordance with a system designed to assure that qualified personnel gathered and evaluated the information submitted. Based on my inquiry of any and all persons directly responsible for gathering and analyzing the information obtained, I certify that the information contained in or accompanying this submittal is to the best of my knowledge and belief, true, accurate, and complete. As to those identified portion(s) of this submittal for which I cannot personally verify the accuracy, I certify that this submittal and all attachments were prepared in accordance with procedures designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those directly responsible for gathering the information, or the immediate supervisor of such person(s), the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Cow Palace, LLC

Signature *Adam Dolsen*

Name Adam Dolsen

Title: President

Date: November 24, 2021

Eric Winiecki Declaration
Exhibit T

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101-3140

ENFORCEMENT &
COMPLIANCE ASSURANCE
DIVISION

January 27, 2022

Eric Weber
Project Coordinator
Landau Associates
2107 South C Street
Tacoma, Washington 98402

Mark Larsen
Project Coordinator
ANCHOR QEA, LLC
1119 Pacific Avenue, Suite 1600
Tacoma, Washington 98402

Re: Cow Palace Dairy Lagoon 1 Closure Report
Administrative Order on Consent ("Consent Order")
Docket No. SDWA-10-2013-0080
Yakima Valley Dairies, Washington

Dear Mr. Weber and Mr. Larsen:

EPA has completed our review of:

- Cow Palace Dairy Lagoon No. 1 and Safety Debris Catch Basin Completion Report ("Report," November 24, 2021)

Based on our review, EPA is concerned about the viability of the liner system in Lagoon 1. Both the primary (upper) and secondary (lower) liners may be currently leaking liquid animal waste into the subsurface. The lower liner may fail prematurely because of the stress it endured during the "blow-out" liner event that occurred over Thanksgiving weekend 2019, and the subsequent attempts to repair it.

EPA has repeatedly cautioned Respondents in the past about avoiding liner construction in winter weather because of the increased potential for adverse weather conditions to occur and cause damage and/or delay of the project. For example, EPA's November 17, 2017, letter (EPA letter No. 163) to Cow Palace Dairy regarding Cow Palace Lagoon 1 stated, "EPA suggests that you submit deliverables in advance of these due dates to avoid the potential of having to install liner during winter weather." Respondent disregarded EPA's advice and was installing liner in Lagoon 1 in late November 2019 when a windstorm occurred and caused significant damage to the secondary liner which was documented by Respondent on November 19, 2019 --- see enclosed image No. 1.

The integrity of the Lagoon 1 liner is suspect because, based on this Report, construction quality assurance plan requirements were not followed during construction of liner system. In addition to concerns regarding physical damage to the secondary liner from the windstorm, it appears that welding

of liner panels was done in freezing temperatures that were outside of specifications requiring a minimum temperature of 32 degrees F.

Construction of the Lagoon 1 liner system coincides with a concerning increase in nitrate concentrations in monitoring well DC-14, which is located about 50 yards directly downgradient of the lagoon --- see enclosed image No. 2. Nitrate concentrations in DC-14 were consistently below the MCL since September 2016 until the Lagoon 1 lining project occurred but rose above the MCL by the June 2020 sampling event after Lagoon 1 was lined and refilled. Concentrations continued to increase in the well every subsequent quarter including the most recent sampling event of June 2021 when the concentration in DC-14 was measured by Respondents at 40 mg/l, which is well above the MCL. The timing of the increase in nitrate concentrations in groundwater coincides with liner repairs completed on the lower liner in December 2019, and the 125,000-gallon leak through the upper liner that was first detected in February 2020 and repaired in May 2020 --- see enclosed image No. 3. The fact that nitrate concentrations in monitoring well DC-14 continued to increase suggests the possibility that the source of the nitrate to the drinking water aquifer was not abated by the liner repairs. EPA is concerned that both the upper and lower liners may be leaking.

The integrity of the lower liner in Lagoon 1 is suspect for several reasons including: liner panels that were damaged during the windstorm during installation were salvaged, cut and rewelded rather than replaced with new liner; repairs were completed under freezing conditions outside of specifications; and the Report states that the original seams were not re-tested after the windstorm. Appendix A, Section 3.2.7, of the QA/QC manual states, “Damaged and rejected panels (or portions) shall be marked, removed from the work area, and the removal recorded/documented.” Pictures in the Report of the wind-blown liner after the storm event show a crumpled liner that clearly had been damaged by winds. The force of the wind and the crumpling would have placed uncontrolled and unquantified stress on the existing seams and likely caused fatigue of the material in mid-panel. The force of the wind, which according to the Report reached 50 mph, was strong enough to lift, crumple and tear in two the 2.3-acre lower plastic liner that weighed roughly 15 tons. The Report indicates the tear occurred along a seam. Before the liner ripped, other liner seams would have been subject to similar extreme stress, and only a small subset of seams were retested.

The first paragraph in Section 2.8) states, "The secondary liner was not compromised." This statement is not substantiated. Electronic leak detection methods were not used to verify that holes and leaks had been located and repaired. A December 5, 2021, photo of the lower liner after repairs shows dirt and wrinkles that would have made visual inspection for leaks and holes difficult --- see enclosed image No. 4.

The Report indicates that panels damaged by the windstorm were not removed. Based on the Report, Respondent pulled the windblown liner back into place using heavy equipment and repaired it, rather than removing the damaged panels as required. The reuse of the wind-blown liner after the damage caused by the wind-blown event is clearly an event that was not anticipated by the manufacturer, and the reuse of the damaged liner was contrary to specifications. The effort to pull the secondary liner back into place with heavy equipment would have placed additional, inordinate stress on the existing liner seams that had already been air-pressure tested before the blow-out occurred.

During the first few days of the liner repair period (December 2-4, 2019) temperatures were below freezing. Any welding done during those days would have required extraordinary efforts to meet the requirements for welding in sub-freezing conditions (see QA/QC manual Appendix A, section 3.3.2), in addition to approval by the Owner's Representative. For example, Appendix R of the Report shows

that the panel 34/35 seam extrusion weld completed on December 2, 2019, at 15:50 was completed at an ambient temperature of 0.4 degrees F, which is 30 degrees outside of the manufacturer's requirement that the minimum temperature in which welding should be done is 32 degrees F. According to Appendix C of the revised Completion Report (Construction Daily Quality Assurance Forms) the Contractor "made the call to begin extrusion welding the repairs on the wind-blown **damaged** 50-mil drain liner in the dry areas of Lagoon 1." Emphasis is added to the word **damaged**. No indication of the required Owner's Representative approval for welding in sub-freezing conditions is presented, and no indication that the salvaged damaged secondary liner was inspected and certified suitable for use is presented.

During installation of the upper liner, precipitation was present on the surface of the lower liner. The primary liner installation was completed in conditions outside of manufacturers specifications. The QA/QC manual requires these deviations to be documented and approved by the Owner's Representative.

Consent Order Paragraph 28 requires, "If any event occurs or has occurred that may delay the performance of any obligation under this Consent Order, whether or not caused by a force majeure event, Respondents shall notify the EPA orally within ten (10) days of when Respondents first had knowledge that the event might cause a delay." Respondents should have notified EPA of the blow-out event within 10 days in accordance with this paragraph but did not. During a December 12, 2019, weekly construction briefing, instead of informing EPA that blow-out had occurred, Respondents informed EPA that construction at Lagoon 1 had been delayed due to staffing problems. There is no mention of the blow-out in the December 2019 monthly report. Had Respondents notified EPA of the blowout, EPA likely would have recommended or required that the damaged lower liner be replaced. Respondent submitted a draft of the Lagoon 1 completion Report on March 1, 2021, that buried information about the blow-out deep in the Report. EPA expects to be informed of major problems when they occur.

The Report states that Respondents discovered Lagoon 1 to be leaking in February 2020 but did not notify EPA of the leak within the required 10 days. The Lagoon 1 O&M Manual states, "In the event of a large leak, the EPA will be notified within 10 days of confirmation. Response action will be taken according to this plan and an annual report will be issued to the EPA documenting the leak, the action taken and verification that the leak had been repaired and the lagoon is fully operational with all leaks repaired." A "large leak" is defined by the O&M Manual for Lagoon 1 as a leak exceeding 1,000 gallons per day. The Report indicates that 120,051 gallons of liquid waste were pumped out of the sump from February 2020 to May 2020, an average of 1,330 gallons per day, which qualifies as a "large" leak. Failure to notify EPA of a large leak within 10 days is a violation of the Consent Order.

The fluctuation of liquid levels measured in the sump since the upper liner was repaired in May 2020 may indicate that the upper liner is leaking and the liner underlying the sump is leaking.
As stated above, EPA is concerned that the leakage that occurred in early 2020 may have penetrated both liners and caused the nitrate concentrations in monitoring well DC-14 to spike. This is one reason that Respondents, including Cow Palace, should continue to monitor the groundwater in accordance with EPA's request. If nitrate concentrations in DC-14 were to decline and return to below the MCL over the next several years, this would suggest that the liner repairs to the primary liner were successful even if the lower liner may still have hole(s) in it. However, continued elevation of nitrate in DC-14 would suggest ongoing leakage from the liner system.

The most likely cause of the rapid increase of nitrate in monitoring well DC-14 is leakage from Lagoon 1. The nitrate concentration in well YVD-06, which is upgradient from Lagoon 1, remained

below the MCL at .67 mg/L in the second quarter of 2021. Like the relatively sudden contamination of YVD-02 by the DeRuyter Dairy that was associated with the conversion of an irrigation ditch to a pipe, the windstorm and subsequent nitrate concentration increases in DC-14 suggest that Dairy actions (or inaction) can result in rapid deterioration of groundwater quality. An activity on the ground surface that mobilizes nitrate may cause the nitrate MCL to be exceeded in the drinking water aquifer within several weeks or months.

Specific Comments

1. Delete from the Report the statement, "The secondary liner was not compromised."

2. Add any written authorizations by the Owner's Representative that indicate that welds done in temperatures below 32 degrees F were done within specifications. Include documentation of the requirements for welding in sub-freezing conditions (see QA/QC manual Appendix A, section 3.3.2).

3. Add to the Report documentation of the re-examination, re-inspection, and clearance for the upper primary geomembrane installation after repairs were made in May 2020.

4. Add to Table 1 a column showing the number of *gallons* of liquid waste that leaked through the upper liner and accumulated in the sump.

Pursuant to Paragraph 14 of the Consent Order, Respondents must address these comments in the Report and resubmit it to EPA no later than February 25, 2022. You may contact me at (206) 553-6904, or your legal counsel may contact Jennifer MacDonald at (206) 553-8311, if you have any questions regarding this letter.

Sincerely,

Eric Winiecki
EPA Project Coordinator
Enforcement and Compliance Assurance Division

Enclosure

cc: Jennifer MacDonald
Rene Fuentes

Enclosure

Image No. 1 from the draft Report - IMG_101010.JPG, 50-mil liner blowout at southern half of Lagoon 1. November 29, 2019, at 10:10 AM.

Image No. 2 - Lagoon 1 is indicated by blue rectangle, groundwater flow is southward. June 2021 concentration of nitrate are shown for groundwater monitoring wells YVD-06, YVD-05, and CC-14.

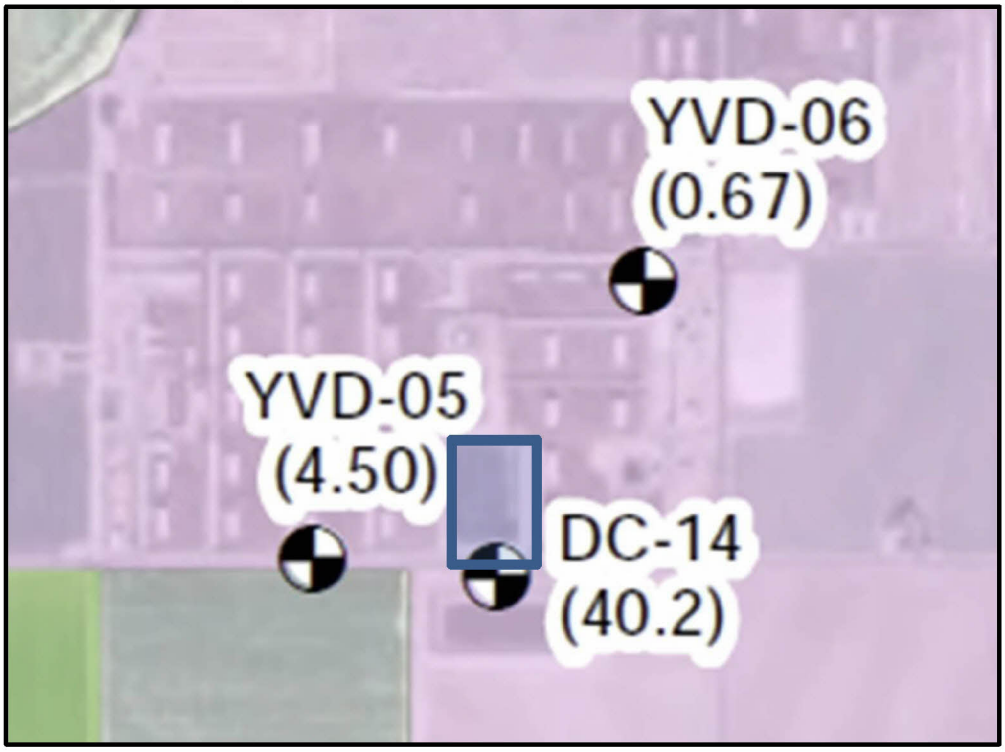


Image No. 3. Lagoon 1 liner installation and nitrate concentrations over time in monitoring well DC-14.

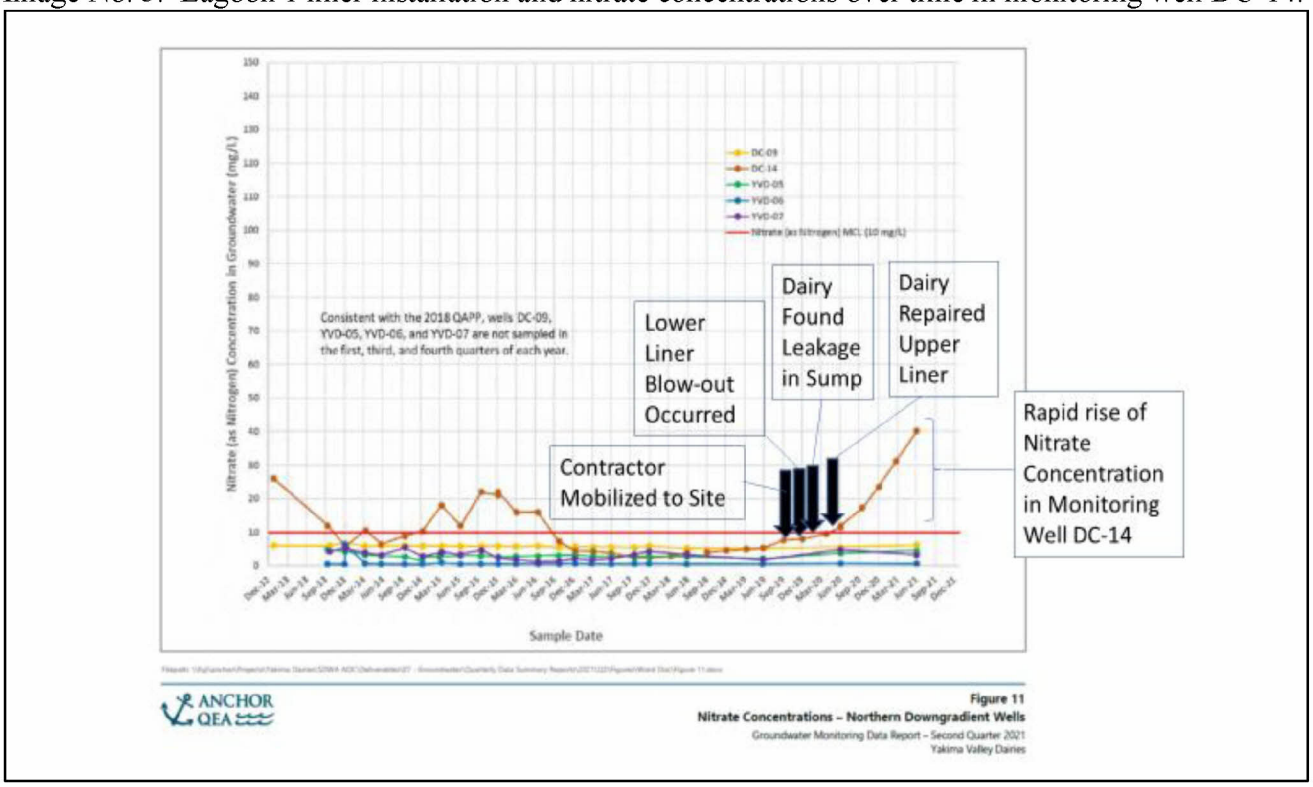
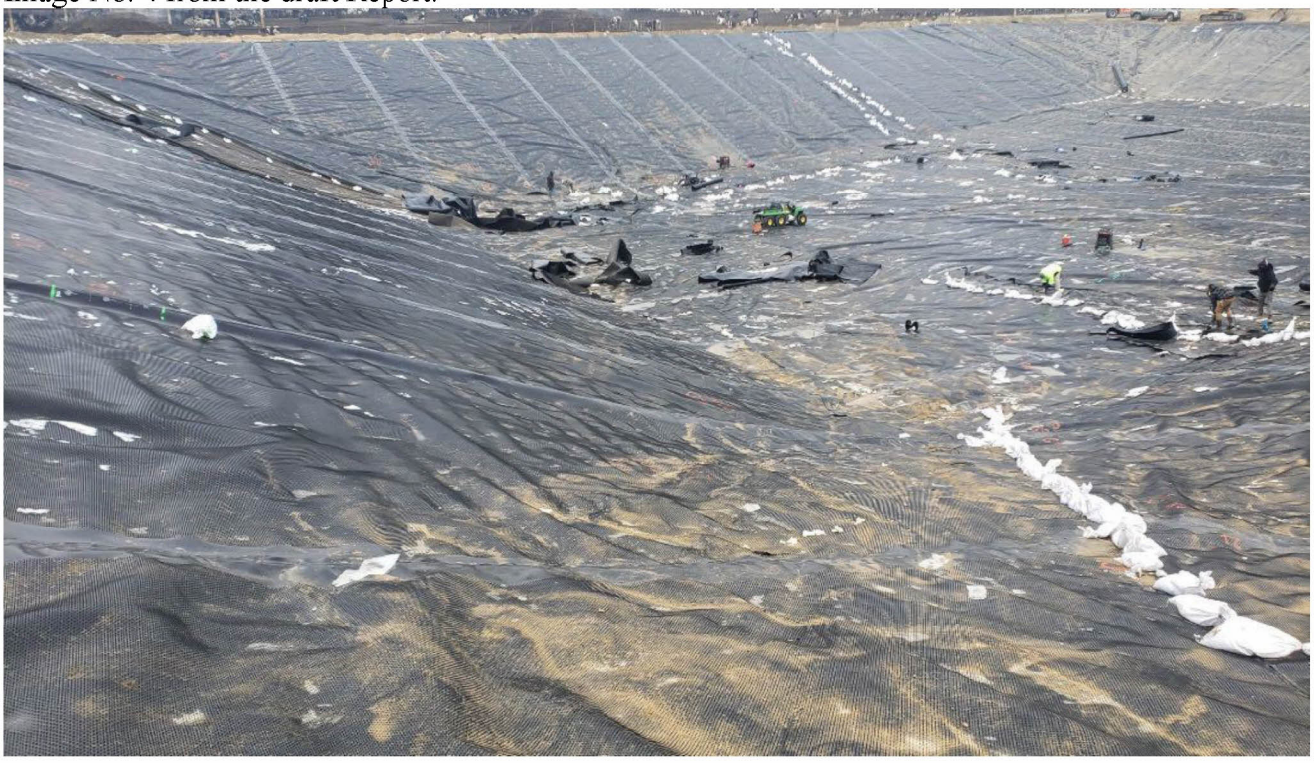


Image No. 4 from the draft Report.



Eric Winiecki Declaration
Exhibit U

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101-3140

ENFORCEMENT &
COMPLIANCE ASSURANCE
DIVISION

April 20, 2022

Mark Larsen
Project Coordinator
ANCHOR QEA, LLC
1119 Pacific Avenue, Suite 1600
Tacoma, Washington 98402

Eric Weber
Project Coordinator
Landau Associates
2107 South C Street
Tacoma, Washington 98402

Re: Cow Palace Dairy Lagoon 1 Closure Report
Administrative Order on Consent ("Consent Order")
Docket No. SDWA-10-2013-0080
Yakima Valley Dairies, Washington

Dear Mr. Larsen and Mr. Weber:

EPA has completed our review of:

- Response to EPA Comment Letter 277 Regarding Cow Palace Dairy Lagoon No. 1 (February 24, 2022)
- Cow Palace Dairy Lagoon No. 1 and Safety Debris Catch Basin Completion Report ("Report," February 24, 2022)

Based on our review, EPA has these comments:

General Comments

1. EPA's observations are:

   - The Lagoon 1 secondary (lower) liner was damaged by the windstorm.

   - Cow Palace's Construction Quality Assurance (CQA) Manager correctly observed and recorded that the lower liner after the windstorm was "damaged."

   - The approved design specified that damaged liner should not be used.

EPA remains concerned about the viability of the liner system in Lagoon 1. Both the primary (upper) and secondary (lower) liners may be currently leaking liquid animal waste into the subsurface. The lower liner may fail prematurely because of the stress it endured during the "blow-out" liner event that occurred during the windstorm over Thanksgiving weekend 2019, and the subsequent attempts to repair it.

2. The CQA manager wrote in the Report that the contractor, "made the call to begin extrusion welding the repairs on the wind-blown damaged 50-mil drain liner in the dry areas of Lagoon 1," clearly using the word "damaged" here as an adjective modifying the noun "liner." Based upon the Report, including the notes and photographs taken by the CQA Manager, it is evident that the lower liner *was* damaged, and that Cow Palace's CQA Manager correctly observed that the liner was "damaged" to indicate that it was torn, displaying stress lines and wrinkling, and very dirty. In your letter you assert that the CQA Manager used the word "damage" as a noun meaning additional work that needed to be done. However, the meaning of the CQA Manager's written statement regarding damaged liner is clear on its face and contradicts your assertion.

   The approved design requires that liner material must be inspected prior to installation and if damage occurred during shipping, then it should be set aside and not used. You argued in your letter that this requirement does not apply to liner damaged by a windstorm. However, common sense suggests that liner damaged in an unexpected windstorm should similarly raise concern about risks associated with damaged liner, and that a similar course of action --- setting it aside and not using it --- would have been appropriate.

3. Your response letter makes several statements about nitrate concentrations at well DC-14 not being related to the liner installation. The rapid increase in nitrate concentrations after the lining of Lagoon 1, however, is apparent in well DC-14. Your stratification hypothesis --- that the increasing nitrate concentration after the liner installation is a function of decreasing water level --- is not supported by the data from monitoring well DC-14. From the time the dedicated pump was installed in well DC-14 until the liner blowout event occurred, the correlation between water level and nitrate concentration was strongly positive ($R^2 = +.86$). But after the blowout the correlation coefficient changed to strongly negative ($R^2 = -.94$). This switch from a positive to negative correlation is not consistent with your hypothesis that one of the variables (nitrate concentration) is dependent on the other (water level). It is consistent with an exogenous event occuring in late 2019 (most likely leakage and/or infiltration associated with the liner blowout) which caused the correlation to switch from positive to negative.

   The elevated nitrate concentrations recently observed in well DC-14 could be from leakage of liquid manure through both liners, and/or from oxygenated water (precipitation) that infiltrated disturbed, contaminated soils beneath the lagoon. Regardless, the fact that samples from the drinking water aquifer in this well were below the nitrate MCL prior to the Lagoon 1 lining project but now greatly exceed the MCL is inconsistent with the goal of the Consent Order to meet the MCL in wells downgradient of dairy sources, and with the purpose of lining the lagoons.

4. The fact that leachate levels in the sump fluctuate between monthly measurement events, even though the pump is not activated, suggests that the primary liner is leaking, and the secondary liner is also leaking. If only the primary liner was leaking, then the pump would be activated once the sump was full. This hypothesis must be tested by:

a. Filling the lagoon to maximum capacity, manually activating the sump pump, and then measuring the level in the sump daily thereafter. If the sump refills, assess whether it refills at a predictable rate. Changes over time in the rate of refilling would indicate a leak (or leaks) through the lower liner in the sump.

b. When the lagoon has been full for at least 30 days, conduct electronic testing of the lagoon to assess whether there is electrical continuity between the lagoon contents and the surrounding soil.

Specific Comment

1. The revisions to Table 1 of the Report are incomplete. For example, on 4/22/20 the sump liquid level was 1.0. On 5/5/20 the sump liquid level was 22.0, which means that the "Gallons of liquid accumulated in sump since last reading" should not be zero. What is the volume of the sump between a liquid level of 1.0 and 22.0? That is the volume that should be entered in the subsequent column "Gallons of liquid accumulated....". Likewise for every subsequent inspection with a difference in sump liquid level a value should be entered in the subsequent column. Note that when the sump liquid level diminishes, which occurs between 11/9/20 and 12/14/20, the "gallons of liquid accumulated in sump since last reading" is negative, which indicates leakage from the sump through the secondary liner (since the sump pump did not activate and the sump liquid level decreased). This table must be filled out and the results discussed.

Because both liners may be leaking, the Lagoon 1 liner system must be tested to assess whether repairs are needed. Pursuant to Paragraph 14 of the Consent Order, Respondent must prepare an addendum to the CQA Plan that provides for the work described in items 4.a and 4.b above, including a schedule to promptly conduct the work, and submit it to EPA no later than May 20, 2022.

Pursuant to Paragraph 14 of the Consent Order, Respondent must address the comments in this letter, such as the required revisions to Table 1, in the next version of the Report. This letter does not attempt to respond to every argument you made in your February 24, 2022 letter, but our lack of response does not mean that we agree with all your arguments.

You may contact me at (206) 553-6904, or your legal counsel may contact Jennifer MacDonald at (206) 553-8311, if you have any questions regarding this letter.

Sincerely,

Eric Winiecki
EPA Project Coordinator
Enforcement and Compliance Assurance Division

cc: Jennifer MacDonald
Don Clabaugh

Eric Winiecki Declaration
Exhibit V

LANDAU ASSOCIATES

May 13, 2022

Eric Winiecki
Project Coordinator
U.S. Environmental Protection Agency, Region 10
Enforcement and Compliance Assurance Division
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101-3140

Transmitted via email to: *Winiecki.Eric@epa.gov*

Re: Letter Re: Cow Palace Dairy Lagoon 1 Closure Report
Administrative Order on Consent ("Consent Order")
Docket No. SDWA-10-2013-0080
Yakima Valley Dairies, Washington
Project No. 1909001.010

Dear Mr. Winiecki,

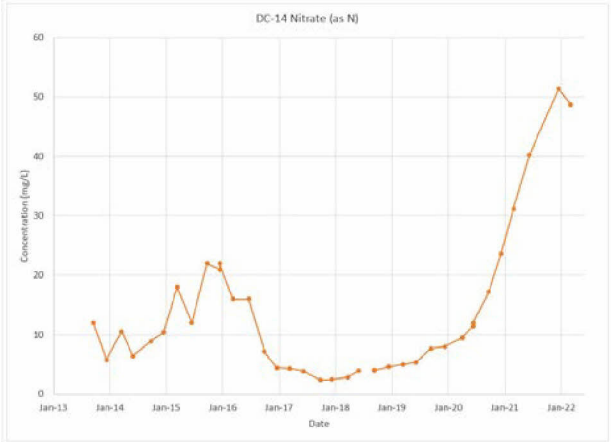
We received EPA Letter 284 from the U.S. Environmental Protection Agency (EPA) dated April 20, 2022 (EPA 2022a). Letter 284 was addressed to Landau Associates, Inc. (Landau; current Cow Palace Consent Order Coordinator) and Anchor QEA, LLC (Anchor; former Cow Palace Consent Order Coordinator). Landau and Anchor are working together to finalize and get final EPA approval of the Cow Palace Dairy Lagoon No. 1 and Safety Debris Catch Basin Completion Report dated February 24, 2022 (Landau 2021; herein the Lagoon 1 Report).

Letter 284 summarizes EPA's comments on the Lagoon 1 Report including Appendix D. Appendix D is a letter prepared by Anchor that responded to EPA Letter 277 (EPA 2022b) regarding the status of the damaged secondary liner and the potential cause of elevated nitrate concentrations at downgradient well DC-14. With regards to EPA comments on the status of the secondary liner, Cow Palace does not have additional information to provide beyond what Anchor has previously provided in the Lagoon 1 Report and the Appendix D Letter. Anchor was the Cow Palace Consent Order Coordinator and the engineer of record for the Lagoon 1 liner project in 2019 when the liner was installed, and we defer to its description of events and circumstances.

However, with regard to the Letter 284 interpretation of data since Lagoon 1 became operational, we have the following responses, indexed by Letter 284 comment numbers:

General Comment #3:

- The reason for the rise in concentrations at DC-14 is unknown. What is known is that nitrate concentrations started to decline after peaking in December 2021 (see graph at right). Cow Palace has completed all source control measures for this lagoon, and all available data and observations would appear to confirm that the lagoon is not currently leaking nor has been leaking at any time since repair of the primary liner was completed.



General Comment #4:

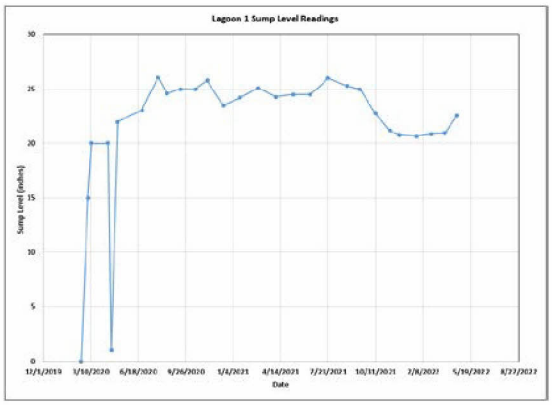
- The current sump-level data confirms the lagoon is not leaking. Minor variations in liner level are expected (see discussion below), and there has never been a sufficient volume of sump pump gallonage to trigger action in accordance with the concepts of leak trigger values and response actions presented in the Lagoon 2 Operations and Maintenance Plan[1] paragraph 4.2.4. Cow Palace will continue to monitor and inspect but given the absence of pumping and the declining concentrations in DC-14, we do not think additional testing is appropriate.

Specific Comment #1:

- Table 1 of the Lagoon 1 Report is not clearly labeled and therefore appears to be incomplete, as EPA pointed out. Our apologies. The third column should be relabeled as "Gallons of Liquid Pumped Since Last Reading." During the period April 15, 2020 through April 22, 2020, 7,051 gallons were pumped from the sump, which lowered the sump level to 1.0 inch. The sump level rose between April 22, 2020 and May 5, 2020 from 1 inch to 22 inches indicating that the primary liner was likely still leaking. However, no additional pumping occurred after April 22, 2020. A revised Table 1 is included as an attachment to this letter.

- On April 22, 2020, Lagoon 1 was pumped down to a level of 3 feet. Subsequently, on May 5, 2020, Northwest Linings & Geotextile Products, Inc., (NWL) inspected the primary liner and repaired and tested the damaged portions (as documented in the Lagoon 1 Report).

- After May 5, 2020, the sump level fluctuated by a small range both up and down within the apparent sensitivity of the sensor readings. There was no apparent trend in sump readings. The last three readings presented in the report, October 30, 2021 to December 20, 2021, appear to indicate a slow declining trend in the sump level. However, additional data collected in 2022 demonstrate that these data are not consistent with declining sump level pattern. Sump readings through April 19, 2022 are shown on the graph at right. These data are consistent with an intact and functional primary liner that prevents leakage since the repair occurred on May 5, 2020.



- The total volume of the sump is 1,643 cubic feet or 12,289 gallons (see sump grading plan; Sheet C-5). Accounting for volume of gravel backfill (porosity 0.30) the total sump liquid volume is about 3,687 gallons. A one-inch change would represent roughly 100 gallons (depending on the depth of liquid in the sump).

- In the two years since completion of the primary liner repair, there has been no accumulation of leachate in the sump (i.e., use of the pump has not been required). The absence of new leachate accumulation demonstrates the success of the repairs, and that the primary liner is intact.

- Other factors that could affect minor changes in sump level may include evaporation, lagoon liquid level, and within-specification leakage through the liner system.

[1] Cow Palace intends to produce a Lagoon 1 Operations and Maintenance Plan once approval of the final completion report has been received.

Please let us know if you would like to discuss this matter further.

LANDAU ASSOCIATES, INC.

Sincerely,

Eric Weber
Landau Associates, Inc.

EFW/KMA/kjg
[\\TACOMA3\PROJECT\1909\001.010\C\TO EPA\LANDAU CORRESPONDENCE\2022 RESPONSE TO EPA LETTER 284\2022_05_13 REPLY TO EPA LTR 284(103116263.1)]

References

EPA. 2022a. Letter: Cow Palace Dairy Lagoon 1 Closure Report, Administrative Order on Consent, Docket No. SDWA-10-2013-0080. From Eric Winiecki, U.S. Environmental Protection Agency; to Mark Larson, Anchor QEA, LLC; and Eric Weber, Landau Associates, Inc. April 20.

EPA. 2022b. Letter: Cow Palace Dairy Lagoon 1 Closure Report, Administrative Order on Consent, Docket No. SDWA 10-13-0080, Yakima Valley Dairies, Washington. From Eric Winiecki, U.S. Environmental Protection Agency; to Mark Larson, Anchor QEA, LLC; and Eric Weber, Landau Associates, Inc. January 27.

Landau. 2021. Revised Report: Cow Palace Dairy Lagoon No. 1 and Safety Debris Catch Basin; Administrative Order on Consent Docket No. SDWA-10-2013-0080. Prepared by Anchor QEA, LLC; revised by Landau Associates, Inc. November 24.

Attachments

Table 1. Lagoon 1 Sump Monitoring Data

TABLE 1

LAGOON 1 SUMP MONITORING DATA

Lagoon 1

Date	Sump Liquid Level (inches)	Change in Sump Liquid Level (inches)	Total Pump Starts	Change in Total Pump Starts	Total Gallons Pumped	Change in Total Gallons Pumped
2/19/2020	0.0		3		20	
3/4/2020	15.0	15.0	125	122	50,000	49,980
3/11/2020	20.0	5.0	425	300	115,000	65,000
4/15/2020	20.0	0.0	425	0	115,000	0
4/22/2020	1.0	-19.0	454	29	122,051	7,051
5/5/2020	22.0	21.0	454	0	122,051	0
6/26/2020	23.1	1.1	454	0	122,051	0
7/29/2020	26.1	3.0	454	0	122,051	0
8/17/2020	24.6	-1.5	454	0	122,051	0
9/14/2020	25.0	0.4	454	0	122,051	0
10/15/2020	25.0	0.0	454	0	122,051	0
11/9/2020	25.8	0.8	454	0	122,051	0
12/14/2020	23.5	-2.3	454	0	122,051	0
1/18/2021	24.2	0.7	454	0	122,051	0
2/26/2021	25.1	0.9	454	0	122,051	0
4/3/2021	24.3	-0.8	454	0	122,051	0
5/10/2021	24.5	0.2	454	0	122,051	0
6/15/2021	24.5	0.0	454	0	122,051	0
7/23/2021	26.0	1.5	454	0	122,051	0
8/31/2021	25.3	-0.7	454	0	122,051	0
9/27/2021	25.0	-0.3	454	0	122,051	0
10/30/2021	22.8	-2.2	454	0	122,051	0
11/29/2021	21.2	-1.6	454	0	122,051	0
12/20/2021	20.8	-0.4	454	0	122,051	0
1/25/2022	20.7	-0.1	454	0	122,052	1
2/24/2022	20.9	0.2	454	0	122,053	1
3/25/2022	21.0	0.1	454	0	122,054	1
4/19/2022	22.6	1.6	454	0	122,055	1

Eric Winiecki Declaration
Exhibit W

STATE OF WASHINGTON

January 29, 2024

Ed Kowalski, Director
Enforcement and Compliance Assurance Division
United States Environmental Protection Agency, Region 10
1200 Sixth Avenue
Seattle, WA 98101

Re: Lower Yakima Valley Groundwater Management for Protection

Dear Director Kowalski:

Thank you for sharing with the state a status update on the Consent Order (Order) issued in March of 2013 to several dairies in the Lower Yakima Valley (LYV). The Washington Department of Health (DOH) and Washington Department of Ecology (Ecology) have a shared interest with the United States Environmental Protection Agency (EPA) in ensuring the protection of public health and the environment in the LYV. More specifically, we have a shared interest in protecting the groundwater from nitrate contamination and ensuring safe and reliable drinking water for people in the area.

We appreciate the strong partnership with EPA in the LYV, including ongoing coordination to best utilize our respective agencies' resources and authorities towards our common goal of protecting public health and the environment. The quarterly meetings established in 2022 have served as an efficient and constructive way to ensure progress, align our efforts, and maintain coordination over the years. As you know, EPA's Order with several dairies in the region served to shape how and where the state focused its resources. Our efforts have focused on activities and in locations of the LYV not specifically covered through the Order so we weren't duplicative to EPAs work, and we could collectively complement and support work across the LYV more broadly.

For over a decade, DOH and Ecology have been working on multiple fronts to protect public health and the environment in areas of the LYV not directly covered by the Order. Our work has included:

- Assessing, mapping, and monitoring for the presence and concentration of nitrate in groundwater.
- Facilitating and approving the Lower Yakima Groundwater Management Plan (Implementing the GWMA Program | Yakima County, WA).
- Engaging with residents in the region on the presence, location, concentration, risks, and solutions to protect them.

- Providing alternative safe drinking water to residents when known concentrations exceed public health protection standards.
- Regulating potential sources from Concentrated Animal Feeding Operations.

Our state-federal partnership is valuable for ensuring a safe and healthy environment through our combined actions in the LYV. Collectively we are all involved and our work over the last decade to align our efforts has been important to optimize our resources broadly and not be duplicative in the work to protect public health and the environment. This extends to ensuring compliance with our respective authorities and activities, including the 2013 Order issued by EPA under section 1431 of the Safe Drinking Water Act (SDWA).

We understand there were certain conditions, including nitrate contamination in residential drinking water wells downgradient of the dairy facilities that led to EPA's use of its authority pursuant to Section 1431 of the SDWA. And we are aware EPA has been working with the dairies and implementing the 2013 Order for over a decade, yet nitrate contamination in groundwater beneath and downgradient of the dairy facilities persists, resulting in a continued human health risk. Thus, we support EPA in its continued exercise of its SDWA 1431 authority to ensure compliance with the 2013 Order and to seek other relief, as appropriate, with the dairies to further address drinking water related concerns in the LYV. We do not plan to duplicate EPA's efforts relating to the dairy facilities that are included in EPA's action under the SDWA 1431.

Thank you for the partnership and coordination. DOH and Ecology look forward to continuing our state-federal partnership in achieving safe, reliable drinking water and a healthy environment for all through our combined actions in the LYV and throughout Washington.

Sincerely,

Heather Bartlett
Deputy Director
Department of Ecology

Lauren Jenks
Assistant Secretary of Environmental Public Health
Department of Health