US Army Corps
of Engineers

ATCHAFALAYA RIVER BAR CHANNEL, LOUISIANA

SITE MANAGEMENT PLAN
FOR THE MAINTENANCE DREDGING
OCEAN DREDGED MATERIAL DISPOSAL SITES EAST AND WEST

AS REQUIRED BY
SECTION 102 OF THE
MARINE PROTECTION, RESEARCH, AND SANCTUARIES ACT

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The following Site Management and Monitoring Plan for the Atchafalaya ocean dredged material disposal sites East and West complies with Section 102©(3) of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. Section 1401, et seq.) as amended by Section 506of the Water Resources Development Act Amendments of 1992 (WRDA 92; public Law 102-580), and has been approved by the following officials of Region 6 and the U. S. Environmental Protection Agency, and New Orleans District of the US Army corps of Engineers.

12/18/2013

Ron Curry
Regional Administrator
Region 6
U.S. Environmental Protection Agency

Date

2/7/2014

Richard L. Hansen
Colonel, U. S. Army
District Commander
New Orleans District
U.S. Army Corps of Engineers

Date

This plan goes into effect up on the date of the last signature for a period not to exceed 10 years. The plan shall be reviewed and revised more frequently if site use and conditions at site indicate a need for revision.

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SITE MANAGEMENT AND MONITORING PLAN

ATCHAFALAYA RIVER BAR CHANNEL, LOUISIANA
OCEAN DREDGED MATERIAL DISPOSAL SITES EAST AND WEST

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LIST OF TERMS

ARBC	Atchafalaya River Bar Channel
CFR	Code of Federal Regulations
EA	Environmental Assessment
EIS	Environmental Impact Statement
ERL	Effects Range - Low
million cy	1,000,000 cubic yards
MLLW	NOAA Mean Lower Low Water datum
MPRSA	Marine Protection, Research, and Sanctuaries Act of 1972
MVN	U. S. Army Corps of Engineers – Mississippi Valley, New Orleans District
NMFS	National Marine Fisheries Service
ODMDS	Ocean dredged material disposal site
RIA	Regional Implementation Agreement
SMMP	Site management and monitoring plan
SPI	Sediment Profile Imaging
USACE	U. S. Army Corps of Engineers
USEPA	U. S. Environmental Protection Agency
WRDA	Water Resources Development Act of 1992

SITE MANAGEMENT AND MONITORING PLAN

ATCHAFALAYA RIVER BAR CHANNEL, LOUISIANA
OCEAN DREDGED MATERIAL DISPOSAL SITES EAST AND WEST

1.0 INTRODUCTION

It is the responsibility of the U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (USACE) under the Marine Protection, Research, and Sanctuaries Act (MPRSA) of 1972 to manage and monitor each of the Ocean Dredged Material Disposal Sites (ODMDSs) designated by the EPA pursuant to Section 102 of MPRSA. Section 102(c)(3) of the MPRSA requires development of a Site Management and Monitoring Plan (SMMP) for each ODMDS and review and revision of the SMMP not less frequently than every 10 years. The 1996 document, *Guidance Document for Development of Site Management Plans for Ocean Dredged Material Disposal Sites* (EPA/USACE, 1996) and the EPA, Region 6 and USACE Mississippi Valley – New Orleans District ODMDS Regional Implementation Agreement (RIA) (EPA/USACE, 2003) have been used as guidance in developing this SMMP.

This SMMP is intended to provide management and monitoring strategies for disposal in the ODMDS East and West locations utilized for Atchafalaya River Bar Channel (ARBC) improvement and maintenance dredging projects. Final designation of ODMDS-East was first sought in 1983. Upon review of the Environmental Impact Statement (EIS), EPA requested that additional surveys be conducted, which were included in the 1990 Supplemental EIS and eventually compiled into the 1997 Final EIS. ODMDS-East received its final designation in 2000. However, use of the ODMDS-East site was discontinued in 2002 due to concerns with transport of material from this site back into the bar channel. This concern necessitated the creation of a new ocean disposal site, leading to the selection of ODMDS-West. The first SMMP specifically for ODMDS-West was published in 2002 as an appendix under Environmental Assessment #348, Atchafalaya River and Bayous Boeuf, Chene, and Black, LA Navigation Project as designated under MPRSA Section 103, but was never signed. The most current SMMP in use for all ARBC ODMDS projects was signed in 1996 and supported the use of only the ODMDS-East. This document supports the use of both the ODMDS-West as well as the ODMDS-East. This revision to the Atchafalaya Bar Channel ODMDS SMMP supersedes all previous SMMPs for ARBC ODMDS projects. Upon finalization of this revised SMMP, the SMMP provisions shall be requirements for all dredged material disposal activities and monitoring activities at the site. The SMMP itself, however, does not authorize the use of any ODMDS for ocean disposal of dredged materials. Use of any ODMDS for ocean disposal of dredged materials is regulated under a permit (or contract specification) under MPRSA section 103. All Section 103 (MPRSA) ocean disposal permits or contract specifications shall be conditioned as necessary to assure consistency with the SMMP. Nothing in this SMMP operates to relieve the USACE from statutory requirements (or to satisfy any such requirements) applicable to the authorization to use an ODMDS for ocean disposal of dredged material other than the requirement that any such use comply with the provisions of the SMMP.

2.0 SITE MANAGEMENT

The Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. Section 1401, et seq.)

is the legislative authority regulating the disposal of dredged material into ocean waters, including the territorial sea. The transportation of dredged material for the purpose of placement into ocean waters is permitted by the USACE or, in the case of Federal projects, authorized for disposal under MPRSA Section 103(e), applying environmental criteria established by the EPA in the Ocean Dumping Regulations (40 CFR Parts 220-229).

Section 228.3 of the Ocean Dumping Regulations established disposal site management responsibilities, stating that "management of a site consists of regulating times, rates, and methods of disposal and quantities and types of materials disposed of; developing and maintaining effective ambient monitoring programs for the site; conducting disposal site evaluation designation studies; and recommending modifications in site use and/or designation."

This SMMP for the ARBC ODMDS East and West was developed jointly by EPA, Region 6 and USACE Mississippi Valley - New Orleans District (MVN), in accordance with Section 102(c)(3) of the MPRSA, as amended by WRDA 92. At a minimum the SMMP shall include but not be limited to:

- A baseline assessment of conditions at the site;
- A program for monitoring the site;
- Special management conditions or practices to be implemented at each site that are necessary for the protection of the environment;
- Consideration of the quantity and physical/chemical characteristics of dredged materials to be disposed of at the site;
- Consideration of the anticipated use of the site over the long-term; and
- A schedule for review and revision of the plan.

2.1 Site Management Objectives

The purpose of ODMDS management is to ensure that placement activities do not unreasonably degrade or endanger human health, welfare, the marine environment, or economic potentialities. The specific management objectives for the ODMDSs are as follows:

1. Ocean discharge of only that dredged material that satisfies the criteria set forth in 40 CFR Part 227 Subparts B, C, D, E, and G and Part 228.4(e) and is suitable for unrestricted placement at the ODMDS;
2. Avoidance of excessive mounding either within the site boundaries or in areas adjacent to the site, as a direct result of placement operations.

These objectives will be achieved through the following measures:

1. Regulation and administration of ocean dumping permits;
2. Development and maintenance of a site monitoring program;
3. Evaluation of permit compliance and monitoring results.

The objective of the SMMP is to provide guidelines in making management decisions necessary to fulfill mandated responsibilities to protect the marine environment. The following

sections provide the framework for meeting these objectives.

2.2 Roles and Responsibilities

Development of SMMPs for ODMDSs within MVN's area of operation is the joint responsibility of EPA, Region 6 and the MVN. Both agencies are responsible for assuring that all components of the SMMP are implementable, practical, and applicable to site management decision-making.

Specific responsibilities of EPA and the MVN are:

In accordance with Section 102 (c) of the MPRSA, EPA is responsible for designation/de-designation of ODMDSs, for evaluating environmental effects of disposal of dredged material at these sites and for reviewing and concurring on dredged material suitability determinations.

The MVN is responsible for evaluating dredged material suitability and issuing MPRSA Section 103 permits, regulating site use, and developing and implementing disposal-monitoring program.

Where use of an EPA-designated site is not feasible, the MVN may, with concurrence with EPA, Region 6 select an alternative site in accordance with Section 103(b) of the MPRSA as amended by Section 506 of WRDA 1992.

2.3 Funding

Physical, chemical, and biological effects-based testing shall be undertaken on sediments to be deposited at the ODMDS. This testing will be conducted at least every 5 years, contingent on the availability of funds, or as necessary to address contaminant concerns due to unanticipated events, and will be funded by the permittee if the project is permitted or MVN for Federal projects. The permittee or MVN, as appropriate, shall also be responsible for costs associated with placement site hydrographic monitoring. Should monitoring indicate that additional studies and/or tests are needed at the ODMDSs, the cost for such work would be shared by the permittee or MVN and EPA Region 6. Physical, chemical, and biological effects-based testing at the ODMDS, or in the site environs after discharge that is not required as a result of hydrographic monitoring, shall be funded by EPA Region 6. Federal funding of all aspects of this SMMP is contingent on availability of appropriated funds.

2.4 Baseline Assessment of Site Conditions and Disposal Site History

The location of ODMDS-East and ODMDS-West, i.e., adjacent and parallel to the ARBC and the rectangular configuration of the sites involves only short transport of the dredged material from the channel to the sites, typically through a floating pipeline. This minimizes interference with other activities such as fishing and navigation in the site environs during dredging and disposal operations. The sites are also easily accessible for surveillance and monitoring.

2.4.1 Site Characterization for ODMDS-East

The ARBC ODMDS-East is located east of and parallel to the Atchafalaya River and Bayous Chene, Boeuf, and Black, Louisiana bar channel and is approximately 18.5 miles long and 0.5 miles wide (Figure 1). For the purposes of this SMMP, all coordinates are based upon the North

American Datum of 1983 unless otherwise noted. The coordinates of the rectangular-shaped site are as follows:

29° 20' 59.92" N, 91° 23' 33.23" W
29° 20' 43.94" N, 91° 23' 09.73" W
29° 08' 15.46" N, 91° 34' 51.02" W
29° 07' 59.43" N, 91° 34' 27.51" W

The center of the site is approximately 19 miles from the mouth of the Atchafalaya River. North Point of the Point Au Fer Island is about 2 miles east of the northern end of the site. Point au Fer Shell Reef, and an area that has been subjected to extensive shell dredging, lies just shoreward of ODMDS-East.

Baseline conditions at the ARBC ODMDS-East were assessed during the site designation process. Details of the baseline conditions, including descriptions of the marine environment in the site vicinity and the physical, chemical, and biological characteristics of the sediments and the water column at the site are contained in the "Supplemental Final Environmental Impact Statement, Atchafalaya River Bar Channel, Ocean Dredged Material Disposal Site, St. Mary Parish, Louisiana," prepared by USEPA,
Region 6 in November 1998.

2.4.2 Site Characterization for ODMDS-West

The ARBC ODMDS-West is located west of and parallel to the ARBC. It is approximately 16 miles long and 3 miles wide (Figure 1). For the purposes of this SMMP, all coordinates are based upon the North American Datum of 1983 unless otherwise noted. The coordinates of the ODMDS-West are as follows:

29° 22' 06" N, 91° 27' 38" W
29° 20' 30" N, 91° 25' 13" W
29° 09' 16" N, 91° 35' 12" W
29° 10' 52" N, 91° 37' 33" W

The center of the ODMDS-West is approximately 20 miles from the mouth of the Atchafalaya River. North Point au Fer Island is approximately 2.5 miles east of the northern end of the site. Point au Fer Shell Reef lies just shoreward of the ODMDS-West.

The ODMDS-West encompasses approximately 31,400 acres or 49 square miles of open water. The inner limit of the ODMDS-West is 2,650 feet from the ARBC centerline. The site ranges from 6 to 23 ft in depth.

Baseline conditions at the ARBC ODMDS-West were assessed during the site designation process. Details of baseline conditions, including descriptions of the marine environment in the site vicinity and physical, chemical, and biological characteristics of the sediments and water column at the site, are described in the "Draft Environmental Impact Statement, Atchafalaya River Bar Channel, ODMDS-West Environmental impact Statement, St. Mary Parish, Louisiana (USEPA/USACE 2013).

2.4.3 Reference Site Characterization

Reference sampling stations for this project have been established based on the Area Approach. The sediment reference sampling stations are located southeast of the ARBC at the following coordinates (NAD 1983):

29° 07′ 00″ N, 91° 31′ 30″ W
29° 08′ 00″ N, 91° 29′ 00″ W
29° 09′ 00″ N, 91° 27′ 00″ W

2.4.4 Historical Use of ODMDS-East

As described in the "Site Management Plan Atchafalaya River Bar Channel Ocean Dredged Material Disposal Site (USACE 1996)," the 1977 interim ARBC ODMDS-East was a long, thin area that paralleled the bar channel reach of the navigation channel, shaped in order to simplify disposal from the bar channel that had been taking place since 1974. At the time of the site designation studies, no changes to the size of the site were recommended. However, MVN did recommend an alteration of the site's footprint prior to designation and publication of the Supplemental Draft EIS on February 6, 1991. MVN called for extension of the ODMDS-East on both ends to plan for current and future increases to the length of the bar channel as the Atchafalaya Delta progrades gulfward. In the proposed rule, the ODMDS-East's dimensions were 30.4 km (19 mi) long and 0.8 km (0.5 mi) wide.

Later in 1991, the northernmost end of the ODMDS-East was converted to use as a CWA Section 404 beneficial use disposal area, with the intent of creating island habitat for colonial nesting seabirds. After these two alterations, the ODMDS-East's dimensions are 29.6 km (18.5 mi) long and 0.8 km (0.5 mi) wide.

The ODMDS-East received final designation in 2000, under 65 FR 31492 (18 May 2000). The Rivers and Harbors Act of June 25, 1910 authorized MVN to construct and maintain the Atchafalaya River, Morgan City to the Gulf of Mexico, LA, project which provided a navigation channel 20 feet deep, 200 feet wide and 15.75 miles long from the 20-foot contour in the Atchafalaya Bay, approximately 4 miles beyond the mouth of the Atchafalaya River, to the 20-foot contour in the Gulf of Mexico. Traffic sufficient to warrant maintenance of the authorized navigation channel to full project dimensions did not immediately develop. The channel was progressively enlarged during maintenance events from 10- by 100-feet in 1939 to 20- by 200-feet in 1974.

The Rivers and Harbors Act of 1968 authorized construction of the Atchafalaya River and Bayous Chene, Boeuf, and Black, LA, project which incorporated the existing project and provided for an increase in channel width of the navigation channel in Atchafalaya Bay and bar to 400 feet. Construction of the channel in the bay and bar was initiated in April, 1974 and completed in December of the same year. History of disposal of dredged material from the Atchafalaya River Bar Channel prior to construction of the enlarged channel in 1974 is incomplete. Dredging records dating back to 1957 indicate that maintenance of discontinuous reaches of the bay and/or bar channel occurred on an annual basis from 1957 until 1974 except for 1961. It is likely that dredged material was placed unconfined in open water on either side of the navigation channel.

Table 1. Disposal History of ODMDS-East

Start Date	Finish Date	Volume Placed (cubic yards)
7 Jun 73	21 Aug 73	3,557,062
11 Apr 74	6 Dec 74	14,409,109
1975	No Dredging	0
21 Aug 75	10 Feb 77	10,888,170
1977	No Dredging	0
1978	No Dredging	0
8 Dec 78	2 Apr 79	10,992,792
1980	No Dredging	0
4 Jul 81	10 Nov 81	9,236,530
1982	No Dredging	0
26 Jun 83	1 Nov 83	10,674,563
25 Sep 85	8 Feb 86	8,500,000
2 Jul 87	31 Aug 87	10,035,209
6 Aug 88	22 Nov 88	10,302,961
29 Jun 89	12 Sep 89	11,111,114
2 Aug 90	17 Nov 90	9,446,109
31 Jan 91	17 Apr 91	1,643,900
7 May 91	25 Sep 91	9,559,859
20-Feb-92	4-May-92	1,000,000
11-May-92	2-Dec-92	9,630,972
14-Mar-93	19-May-93	4,035,076
10-Jun-93	16-Sep-93	11,700,000
14-Aug-93	14-Sep-93	2,254,937
14-Apr-94	26-May-94	1,836,445
27-May-94	16-Oct-94	8,757,597
23-Jun-95	25-Oct-95	9,311,000
16-Apr-96	16-Dec-96	11,589,416
30-Sep-97	9-Dec-97	6,968,673
16-Aug-98	21-Nov-98	10,942,132
11-Aug-99	23-Oct-99	10,847,337
26-Jun-00	18-Aug-00	10,749,971
27-Feb-01	29-Apr-01	9,554,971
29-Apr-01	6-May-01	1,269,887
22 Sep 01	13 Apr 02	9,168,753
TOTAL		239,974,545
AVERAGE PER FISCAL YEAR CYCLE		8,274,984

Between 1974 and 1991, all of the dredged material removed during routine maintenance of the bar channel was placed in the ODMDS. Prior to the 1991 maintenance event, the 193-acre upper end of the ODMDS was incorporated into a 360-acre disposal area designated under Section 404 of the Clean Water Act for placement of dredged material for creation of islands for colonial nesting seabirds. Beginning with the 1991 maintenance event and during subsequent annual maintenance events, dredged material from the bar channel suitable for stacking has been used beneficially by deposition in the Section 404 site. Material not suitable for beneficial use has been placed in the ODMDS.

Historical use of the ODMDS-East between 1973 and 2002 are depicted in Table 1. Available maintenance dredging contract information does not distinguish dredging work performed between the ARBC and other Atchafalaya River dredging reaches prior to 1973, therefore, disposal information prior to 1973 is not included. Historically, the ODMDS-East has received dredged material from the ARBC via a cutterhead hydraulic pipeline dredge, discharging directly into the site.

Table 2. Disposal History of ODMDS-West

Date of Disposal Operation		Disposal Method	Reach Dredged	Volume Placed (cubic yards)
Start	Finish			
21-Aug-02	27-Oct-02	Unconfined	Sta. 650 to Sta. 1340	6,797,817
24-Nov-02	12-Feb-03	Unconfined	Sta. 776 to Sta. 1355	9,125,381
10-Nov-03	12-Feb-04	Unconfined	Sta. 650 to Sta. 1353	9,099,924
9-Apr-04	21-May-04	Unconfined	Sta. 650 to Sta. 1216	5,720,499
8-Jan-05	27-Apr-05	Unconfined	Sta. 650 to Sta. 1355	12,917,556
3-May-06	5-Jul-06	Unconfined	Sta. 650 to Sta. 1355	8,168,569
4-Feb-07	27-Apr-07	Unconfined	Sta. 650 to Sta. 1339	8,576,338
20-Jul-07	10-Dec-07	Unconfined	Sta. 695 to Sta. 1244	6,261,539
17-Jun-08	26-Sep-08	Unconfined	Sta. 650 to Sta. 1270	9,545,797
26-Aug-09	15-Jun-10	Unconfined	Sta. 650 to Sta. 1355	11,246,103
8-Oct-10	11-Feb-11	Unconfined	Sta. 650 to Sta. 1355	9,230,662
8 Aug 11	23 Sep 11	Unconfined	Sta. 650 to Sta. 1355	319,179
27-Sep-11	18-Nov-11	Unconfined	Sta. 650 to Sta. 1355	372,457
TOTAL				**97,381,821**
AVERAGE PER FISCAL YEAR CYCLE				**10,820,202**

2.4.5 Historical Use of ODMDS-West

The ARBC ODMDS-West has been used for disposal of dredged materials since 2002 under the authority of MPRSA Section 103 (b). As described in the "Draft Environmental Impact Statement, Atchafalaya River Bar Channel, ODMDS-West Environmental impact Statement, St. Mary Parish, Louisiana," (EPA 2013) the proposed ARBC ODMDS-West was evaluated for the continued placement of maintenance dredged material originating from the ARBC, at an approximate average volume of 10.8 million cy per dredging cycle (Table 2). The ODMDS-West is situated in a high-energy erosional zone and can generally accept large volumes of dredged material with little apparent net change to the bottom. The dredged material discharged into this site will disperse relatively quickly because of the high percentage of fine grain components and because of the location of the site in a high energy, nearshore area where waves, currents, winds, and tides constantly mix and redistribute sediments, and thus, the dredged material, over a wide area. The site is situated within the inlet zone and is adjacent to the channel, providing easy access for dredged material placement operations and reduced costs.

The size of the ODMDS-West was determined based upon: 1) the need to maximize the discharge distance away from the ARBC to minimize the run back of the deposited dredged

material into the channel; and 2) the need to allow for adjacent pumping of the dredged material from within the reaches of the ARBC. As a result, the dimensions of the proposed ODMDS-West were determined to be 16.0 miles long and 3.0 miles wide (typically the pumping distance at which a hydraulic pipeline cutterhead suction dredge may no longer be cost effective without a booster pump, depending on the size of the dredge).

The ODMDS-West has received approximately 10.8 million cubic yards (mcy) per fiscal year dredging cycle at an average frequency of once every 7.4 months. This frequency and volume is expected to continue into the future. Material is dredged from the ARBC via a cutterhead hydraulic pipeline dredge, discharging no closer than 5,000 feet from the ARBC centerline in an effort to limit run-back of fluff material into the channel. Dredged volumes since 2002 are depicted in Table 2.

Table 3: Sediment Composition

LOCATION	% SAND	% SILT	% CLAY
Channel	9.5	82.6	6.9
ODMDS-West	13.6	28.7	57.7
ODMDS-East	44.6	33.1	22.3
Reference Area	8.0	80.9	11.1

2.5 Dredged Material Volumes

Since 1973, the ARBC has been dredged every year except 1975, 1977, 1978, 1980, and 1982, with the dredged material placed at the ODMDS-East, ODMDS-West, Bird Island-East (Section 404), and/or Bird-Island-West (Section 404). Both Bird Island-East and Bird Island-West are Clean Water Act Section 404 designated dredged material disposal sites, abutting the northern boundary of the ODMDSs (Figure 2).

Since 1973, the annual quantity of material placed at either ODMDS has ranged from about 3.6 million cy to about 18 million cy, or averaging approximately 8.3 million cy for the ODMDS-East and 10.8 million cy for the ODMDS-West per fiscal year when maintenance dredging is required. The dredged material originating from the ARBC is predominantly made up of silts with traces of sand and clay (Table 3), as confirmed from samples collected in February 2008 (PBS&J, 2008). It is anticipated that annual maintenance of the ARBC will continue in the future as authorized channel dimensions will need to be maintained.

Table 4: Sediment Quality Assessment History

Date	Type of Testing	Reference
December 1996	Bulk Analyses & Toxicity Assessment	EH&A, 1997
April 2002	Bulk Analyses, Toxicity, & Bioaccumulation Assess	PBS&J, 2002
February 2008	Bulk Analyses, Toxicity, & Bioaccumulation Assess	PBS&J, 2008

2.6 Dredged Material Suitability

On September 24, 1992, a RIA was executed between USEPA Region 6 and USACE-MVN (USEPA/USACE, 2003). The RIA was revised and updated, and a new RIA issued November 3, 2003. This RIA described protocols for evaluating the quality of the dredged material and

implementation of the "GREEN BOOK" (USEPA/USACE, 1991). These protocols describe chemical parameters to be analyzed, as well as required detection limits. It also specifies how toxicity testing and bioaccumulation assessments are to be conducted, as well as organisms to be utilized. Since that time, all sediment evaluations have been conducted in accordance with the RIA. The dredged material from the ARBC has been evaluated several times to determine suitability for offshore placement. This testing was performed to determine levels of metals and organic constituents, as well as toxicity and bioaccumulation assessments. A history of the testing performed on sediments destined for placement in the ODMDS-East and ODMDS-West is summarized in Table 4. The results of the testing indicated that the material was suitable for offshore placement without special management or handling during disposal operations.

2.7 Anticipated Site Use

Maintenance dredging of the ARBC is required on an annual basis. Dredged material is typically removed using hydraulic cutterhead pipeline dredges and discharged as non-cohesive slurry though a floating pipeline. It is anticipated that if dredged material is removed by hopper dredge the material will be primarily discharged by agitation. It is anticipated that annual maintenance of the ARBC and disposal of dredged material into the ODMDS-East and the ODMDS-West will continue in the future. On the average, approximately 10.8 million cy of dredged material will be placed at the ODMDS-West and/or the ODMDS-East per fiscal year dredging cycle, estimated to be once every 7.4 months.

2.8 Special Management Conditions or Practices

As previously discussed, evaluations of sediment quality have indicated that the material from the channel is suitable for offshore placement. However, all operations shall be conducted such that the dredged material remains within the bounds of the ODMDSs immediately following descent to the ocean floor, and placed in a location to minimize return of the placed material back into the ARBC. The 2003 fluid mud study found that sediment from the ARBC predominantly drifted to the northwest; therefore, when using the ODMDS-West, placement of dredged material no closer than 5,000 feet from the ARBC centerline is required for the greatest possible reduction of sediment runback into the channel while minimizing dredging cost increases associated with the addition of longer lengths of discharge pipeline. During disposal operations, a baffle plate may be positioned on the end of the discharge pipeline to ensure placement of dredged material within the western most portions of the designated boundary of the ODMDS.

A seasonal hopper dredging restriction has been recommended by the National Marine Fisheries Service (NMFS, 2007) during formal consultation undertaken pursuant to Section 7 of the Endangered Species Act. This restriction was based on potential impacts of hopper dredging operations on several species of threatened and endangered sea turtles. The recommendation is to restrict hopper dredging to the period from December 1 through March 31, during which sea turtle abundance is at a minimum in the Gulf of Mexico. This recommendation pertains, however, only to actual hopper dredging operations. Hopper dredging would be conducted in accordance with all reasonable and prudent measures and implementing terms and conditions described in the 2007 Gulf of Mexico hopper dredging regional biological opinion (NMFS, 2007). Hydraulic cutterhead dredges are exempt from these sea turtle protection measures because their operations are not known to result in injuries to sea turtles.

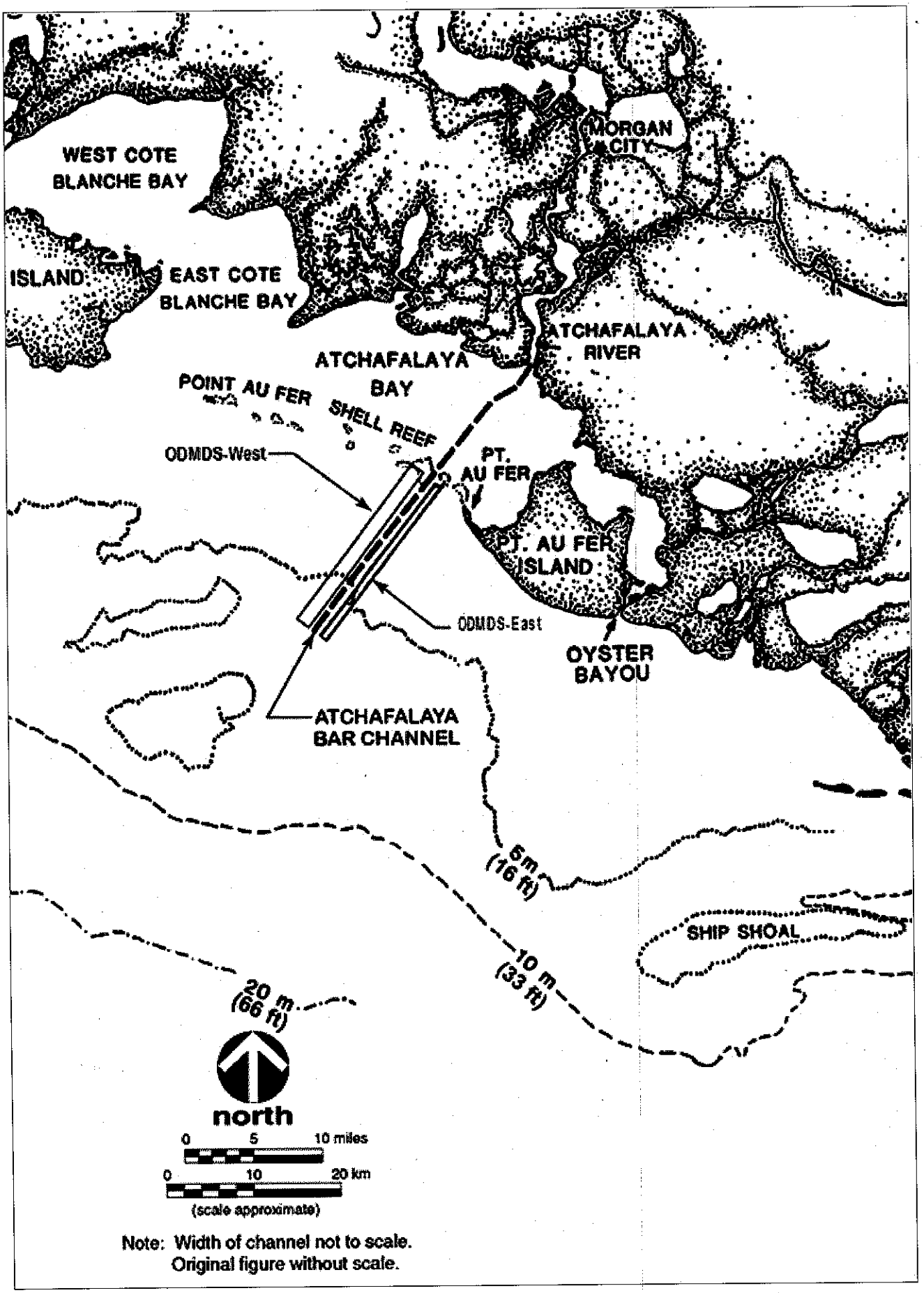

Figure 1. Atchafalaya Bar Channel - ODMDS East and ODMDS West. (Source: PBS&J 2008)

3.0 SITE MONITORING

The MPRSA establishes the need for including a monitoring program as part of the Site Management and Monitoring Plan. Site monitoring is conducted to ensure the environmental integrity of a disposal site and the areas surrounding the site and to verify compliance with the site designation criteria, any special management conditions, and with permit requirements. Monitoring programs should be flexible, cost effective, and based on scientifically sound procedures and methods to meet site-specific monitoring needs.

The intent of the monitoring program is to provide the following:

1. Information indicating whether the disposal activities are occurring in compliance with the permit and site restrictions;
2. Information indicating short-term and long-term fate of materials disposed of in the marine environment
3. Information concerning the short-term and long-term environmental impacts of the disposal.

The primary purpose of the Site Management and Monitoring Program is to determine whether dredged material site management practices, including disposal operations, at the sites need to be changed to avoid unreasonable degradation or endangerment of human health or welfare or the marine environment. Monitoring results will be used for making decisions, preventing unacceptable adverse effects beyond each site's boundary, and ensuring regulatory compliance over the life of the ODMDS East and West. Emphasis will be placed on determining physical impacts, since, to date, dredged material from the ARBC has been determined to be acceptable for ocean placement; however, consideration of contaminants will also be included.

Testing of dredged material is conducted based on "GREENBOOK" and RIA procedures; however it is necessary to verify the decisions made regarding the suitability of the dredged material are correct and that the material is not having an adverse impact to the environment.

The size and location of the ARBC ODMDS East and West were determined pursuant to the General Criteria as listed in 40 CFR 228.5, and the Specific Criteria at 40 CFR 228.6(a). There are no significant environmental resources delineated within or immediately outside of the ODMDS East and West. The primary concern regarding ODMDS use is the potential for short-term build up of dredged material, such that a hazard to navigation is presented. Since these sites are dispersive in nature, it is expected that material will eventually be transported outside of the site boundaries. It is also expected that this material will not move in distinct mounds, but instead will blend with the surrounding environment causing a progressive transition to sediment containing a higher percentage of silt and clay.

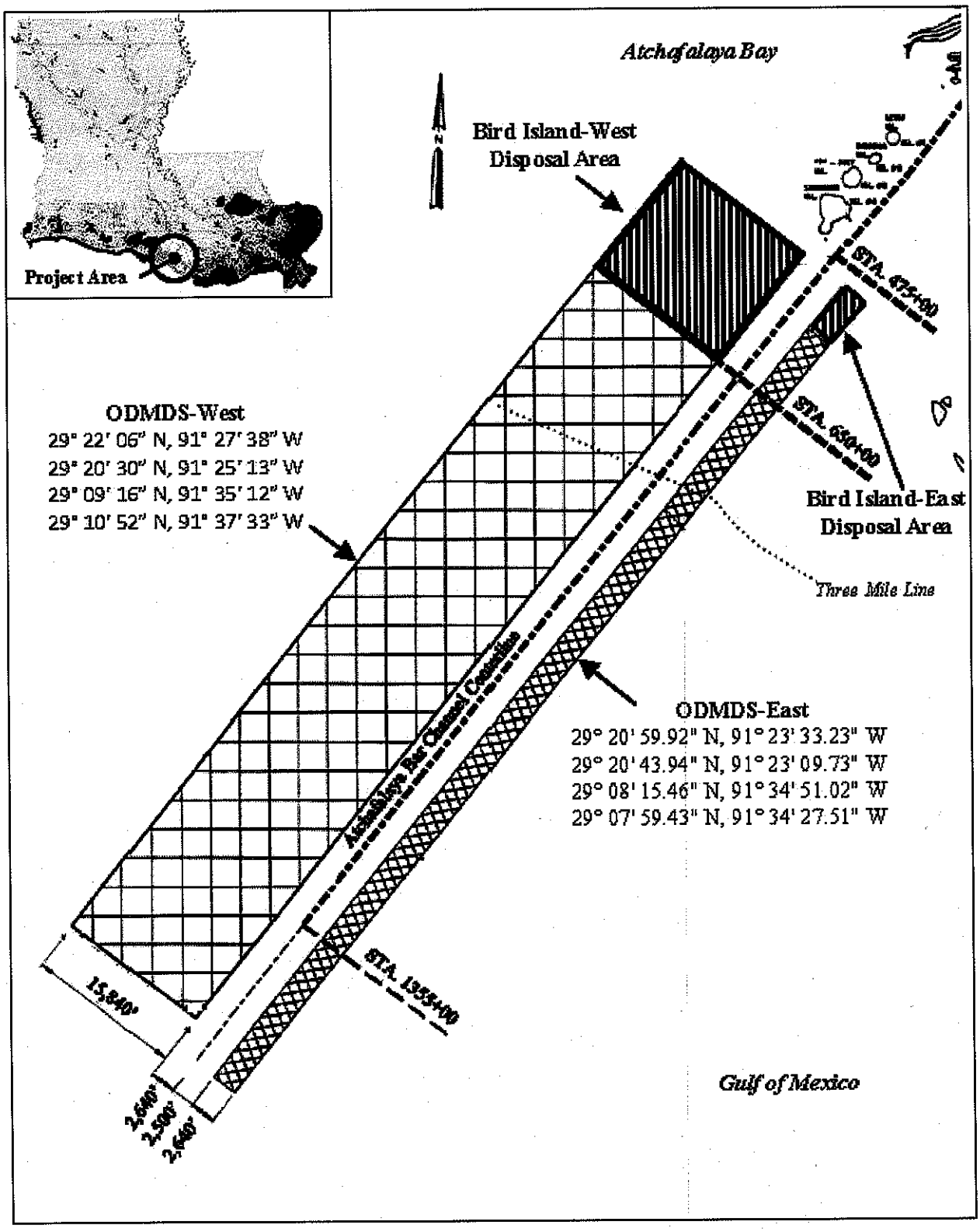

Figure 2. Atchafalaya Bar Channel - Disposal Sites ***(coordinate system = NAD83).***

Discharges of dredged material outside of the ODMDS East and West boundaries will be treated as "unauthorized discharges." Such discharges may occur as a result of dredging equipment malfunction during dredging operations with spillage of material outside of the ODMDS boundaries, or discharge of dredged material in close proximity to an ODMDS boundary such that it falls outside of the site during descent to the seafloor. While significant environmental resources were not identified immediately outside of the ODMDS East and West boundaries during site designation evaluations, unauthorized discharges may be detrimental to immobile or slow moving benthic organisms. A laboratory study conducted by Maurer et al. (1978) suggested that benthic organisms can burrow through 6-9 inches of dredged material without significant impacts to the benthic community. The formation and persistence of mounds above this 6-9 inch threshold, as a direct result of unauthorized discharges outside of the ODMDS boundaries, warrants additional investigation to determine if benthic communities have been adversely impacted.

3.1 Baseline Monitoring

Table 5 summarizes various site characterization surveys of the ODMDS-East and ODMDS-West conducted by the USACE, EPA, and others as part of the designation process and subsequent monitoring to evaluate the dredge material management effectiveness for the ODMDS East and West. These surveys will serve as the main body of data for future monitoring of the impacts associated with the use of the ARBC ODMDS East and West.

3.2 Disposal Monitoring

The MVN will monitor and record the location of discharge points during dredging and disposal operations. At a minimum, the following information will be documented:

a) Disposal vessel name
b) Location of disposal points
c) Estimated volume dispersed at disposal points
d) Description of material disposed
e) Source of Dredged Material
f) Date, time and location at start of initiation and completion of disposal event

All data will undergo appropriate Quality Assurance / Quality Control procedures, such that compiled information accurately captures dredging and disposal operations. Currently, the best available sources of data for cutterhead dredges are the contractor-furnished As-Built Drawing and Narrative Completion Report. When available, data from other cutterhead dredge monitoring systems (similar to those available for hopper dredges through the USACE Dredging Quality Management Support Center) will be used to supplement or in place of contractor-furnished data. Dredging and disposal data will be provided to the EPA R6 in the Post-Disposal Summary Report described in Section 3.4 of this SMMP. Should an unauthorized discharge occur outside of the ODMDS, MVN will notify the EPA Region 6 within a reasonable period of time upon discovery of the event.

Table 5. Surveys Conducted at the Atchafalaya ODMDS-East and ODMDS-West

Survey/Study	Site	Date	Conducted by	Objectives	Reference
Analyses of native water, bed material, and elutriate samples of major Louisiana waterways, 1975	ODMDS-East	1976	USGS	Channel bed toxicity & elutriate sample assessment	Demas 1976
Analyses of native water and dredged material from southern Louisiana waterways, 1975-76	ODMDS-East	1977	USGS	Dredged material toxicity assessment	Demas and Higgins 1977
Analyses of native water, core material, and elutriate samples collected from the Atchafalaya River and Atchafalaya Bay	ODMDS-East	1977	USGS	Channel bed core material toxicity & elutriate sample assessment	Demas 1977
Bioassay and bioaccumulation testing of proposed dredge sediments in the Atchafalaya River, Louisiana	ODMDS-East	Mar 1979	ERT	Bioaccumulation and bioassay assessment	Drawas et al. 1979a
Bioassay testing of proposed dredge sediments in the Atchafalaya River, Louisiana	ODMDS-East	June 1979	ERT	Bioassay assessment	Drawas et al. 1979b
Analyses of native water, bottom material, elutriate samples, and dredged material from selected southern Louisiana waterways and selected areas in the Gulf of Mexico, 1979-81	ODMDS-East	1983	USGS	Dredged material toxicity assessment & elutriate sample assessment	Lurry 1983
Report of Field Study	ODMDS-East	1983	IEC	Acquire data for final site designation – water, sediment, biological, and tissue analyses	IEC 1983
National Oceanic Survey Chart 11351 – Port au Fer to Marsh Island	ODMDS-East	1989	DOC, NOAA, NOS	Establish bathymetry for safe navigation	DOC, NOAA, NOS 1989
Draft data report: results of toxicity tests on sediments collected from dredged navigation channels along the Louisiana Coast	ODMDS-East	1990	EPA, ERLN	Bulk chemistry & toxicity analysis	Dettmann and Tracey 1990
Contaminant Assessment	ODMDS-East	Mar 1991	Anacon	Water & elutriate analysis	n/a
Benthic macrofaunal community structure in ocean dredged material disposal sites in Louisiana: Preliminary analysis	ODMDS-East	1994	EPA	Water quality, sediment toxicity, benthos	Flemer et al. 1994
Region VI Contaminated Sediment Study – Phase III	ODMDS-East, ODMDS-West	June/July 1996	Battelle	Bulk sediment, toxicology, benthics, fish community, and tissue analysis in ODMDS and reference sites	Trulli 1996
Recommendations for Reduction of shoaling in the Atchafalaya River navigation bar channel	Bay, Channel	2000	Louisiana State University	Study of the nature and seasonality of fluff, and its response to ship traffic	van Heerden and Kemp 2000
Factors affecting fluff and fluid mud accumulation in the Atchafalaya Bar Channel	Bay, Channel	2003	USACE	Effects of disposal site location, channel enlargement, and structural measures on shoaling in the channel	Teeter et al. 2003
Atchafalaya Bar Channel Fluff & Fluid Mud Study	Bay, Channel	Dec 2003	USACE, GVI	Analysis of fate and transport pathways of fluid mud/fluff to determine appropriate management alternatives	GVI 2003
Silt sediment transport study to investigate fate and efficiency of dredging and characterization of lateral dredge disposal sites	ODMDS-East, ODMDS-West	2006	ETS	Silt tracer study using fluorescents to evaluate effectiveness of dustpan dredging	ETS 2006

3.3 Bathymetric Surveys

3.3.1 Routine Bathymetric Surveys

The ODMDS-West and the ODMDS-East are both located outside of the safety fairway for large vessel traffic, therefore, the mounding will be considered in regard to shallow-draft vessels, only. Since the sites are dispersive, movement of material from the site is expected to occur after disposal operations cease. It is expected that the material will not move in distinct mounds, but instead will blend with the surrounding environment causing a progressive transition to sediment containing a higher percentage of silt and clay. Considering the grain-size characteristics of typical maintenance dredged material from this channel, significant mounding is not expected subsequent to discharge operations. The threshold elevation for mounding of dredged material within the ODMDS East or West will be five (5) feet above the existing bottom elevation while maintaining at least two (2) feet of clearance between the top of the mound and the water's surface.

Discharge of dredged material in close proximity to an ODMDS boundary may result in a portion of the material falling outside of the ODMDS during descent to the seafloor. That portion of dredged material falling outside of the ODMDS during descent would be considered an unauthorized discharge. Such an unauthorized discharge may produce a mound that is partially within the ODMDS and partially outside of the ODMDS. For discharge points documented within 500 feet of an ODMDS boundary, the presence of a distinct seafloor mound – either in excess of 1 foot above background variation observed along a survey transect line that bisects the mound; or 6-9 inches above background variation on a transect line along the ODMDS boundary and parallel to the discharge point – may indicate that dredged material was partially discharged outside of the ODMDS.

Bathymetric surveys will be used to monitor for mounding to ensure a navigation hazard is not produced, help determine if dredged material was discharged outside of the ODMDS boundaries, to assist in verification of material placement, and to monitor bathymetry changes and trends. Results from post and pre dredge bathymetry shall be provided to EPA Region 6 when completed as part of the summary report (See Section 3.4).

Bathymetric surveys for each ARBC maintenance dredging contract will be obtained before the start of disposal operations, and within 45 days following completion of disposal operations. Bathymetric surveys shall be conducted by the MVN or site user along transects within the ODMDS. These transects shall primarily be oriented parallel to the channel and centered on the areas of discharge in the ODMDS (approximately 5,000 feet west of the channel centerline for the ODMDS West, and approximately 4,500 feet east of the channel centerline for the ODMDS East). Additional bathymetric survey transects will be performed parallel to, and 1,000 feet east and west of, these discharge-centered survey transect lines. The spacing of the transect line nearest to the ODMDS boundary may be adjusted to fall within or along the boundary line (i.e., less than 1,000 feet from the discharge-centered transect line).

The minimum performance standards from table 3-1 in *Hydrographic Surveying* shall be followed. Horizontal location of the survey lines and depth sounding points will be determined by an automated positioning system utilizing a differential global positioning system. The

vertical datum will be referenced to prescribed NOAA Mean Lower Low Water (MLLW) datum. The horizontal datum should be referenced to the local State Plane Coordinate System (SPCS) for that area or in Geographical Coordinates (latitude-longitude). The horizontal reference datum should be the North American Datum of 1983 (NAD 83).

Bathymetric surveys shall be obtained using a USACE or contract survey vessel equipped with electronic surveying capabilities. The vessel must be equipped with positioning equipment with a horizontal precision of one (1) to three (3) meters. The fathometer, which shall display real-time depth on real-time location, must have a precision of approximately 0.5 feet. All data shall be collected using methodology described in Engineer Manual EM 1110-2-1003, dated January 1, 2002 [http://140.194.76.129/publications/eng-manuals/em1110-2-1003/toc.htm].

Data Analysis

- If deposited dredged material is not mounding to heights greater than the 5-foot threshold height above the existing bottom elevation, while maintaining at least 2 feet of clearance between the top of the mound and the water's surface, and there is no evidence of a significant discharge of dredged material outside of the ODMDS boundaries, then the management objectives are met.

- If mounding heights within the ODMDS exceed the safe navigation threshold (mounds greater than 5 feet high or with less than 2 feet of clearance from the water's surface); or there is evidence of an unauthorized discharge (known discharge point within 500 feet of an ODMDS boundary and associated distinct mound with a height in excess of 1 foot within the ODMDS or 6-9 inches along the ODMDS boundary), subsequent advanced bathymetric surveys of the affected area will be performed to monitor mound dispersion or persistence. If these bathymetric surveys indicate that the dredged material has dispersed, no further action is necessary. However, should the surveys indicate that a dredged material mound is persistent, MVN and EPA Region 6 will develop appropriate management actions. Such actions could include notifying mariners of a hazard, modifying future disposal operations to reduce the likelihood of mound formation, expansion or relocation of the ODMDS, or physically altering the mound.

3.3.2 Bathymetric Surveys Conducted for Unauthorized Discharges

Discharges of dredged material outside of the ODMDS East and West boundaries will be treated as "unauthorized discharges". Such discharges may occur as a result of dredging equipment malfunction during dredging operations with spillage of material outside of the ODMDS boundaries, or discharge of dredged material in close proximity to an ODMDS boundary such that it falls outside of the site during descent to the seafloor. In the event of an unauthorized discharge outside of the ODMDS, bathymetric surveys will be conducted to identify the extent of the affected area or estimate the quantity of dredged material associated with the discharge. In such situations, joint discussions between EPA Region 6 and MVN will determine management actions appropriate to resolve the unauthorized discharge.

Table 6. ARBC ODMDS Monitoring Strategies and Action Thresholds

Goal	Technique	Sponsor	Rationale	Frequency	Action Threshold	Management Options	
						Threshold Not Exceeded	Threshold Exceeded
Monitor Bathymetric Trends	Routine Bathymetric Survey	Contractor/ USACE	Determine the extent of the disposal mound and movement of material beyond limits of ODMDS	Pre and post disposal (45 days) for significant projects (>50,000cy)	(1)Mounding >5 ft; <2 ft draft allowance in shallow waters (2) Evidence of an unauthorized discharge outside of ODMDS boundary	Continue Monitoring	Initiate Advanced Bathymetric Surveys of the affected area.
	Advanced Bathymetric Survey	Contractor/ USACE	Determine changes in dispersion of material until impacts are no longer observed	As Needed	(1)Mounding > 5 ft; <2 ft draft allowance in shallow waters (2) Persistence of a mound (limited or no dispersion observed between surveys)	Continue Monitoring	Consider various management options, ex. (1)Modify disposal method/placement (2)Restrict disposal volumes (3) expansion of ODMDS (4) relocation of ODMDS
Ensure Safe Navigation Depth	Bathymetry	Contractor/ USACE	Determine height of mound	Post disposal (45 days) for significant projects (>50,000cy)	Mound height >5 ft; <2 ft draft allowance in shallow waters	Continue Monitoring	(1)Modify disposal method/placement (2)Direct disposal operators to avoid areas shallower than XX feet (3)Physically level material shallower than 2 feet (4)Notify mariners of mound location and depth
Project Disposal Monitoring	Post Disposal Summary Report	Contractor/ USACE	(1) Ensure management requirements are being met; (2) to assist in site monitoring	90 days after project completion	Disposal records required by SMMP are not submitted or are incomplete	Continue monitoring	Request extension from EPA Region 6
ODMDS Trend Assessment	Water and Sediment Quality, Benthic Community Analysis (40CFR228.13)	EPA	Periodically evaluate the impact of disposal on the marine environment (40CFR 228.9)	Approximately every 10 years as funding allows.	(1) Absence from the site of pollution sensitive biota (2) Progressive non-seasonal changes in water or sediment quality	Continue Monitoring	(1)Conduct Environmental Effects Monitoring or Advanced Environmental Effects Monitoring (2)Review dredged material evaluation procedures (3)Consider isolating dredged material (capping)

Table 6 (continued). ARBC ODMDS Monitoring Strategies and Action Thresholds

Goal	Technique	Sponsor	Rationale	Frequency	Action Threshold	Management Options	
						Threshold Not Exceeded	Threshold Exceeded
Environmental Effects Monitoring	Chemical Monitoring	EPA	Determine if chemical contaminants are significantly elevated[1] within and outside of site boundaries	Implement if (1) disposal footprint extends significantly beyond the site boundaries; or (2) if Trend Assessment results warrant	Contaminants are found to be elevated[1]	Discontinue monitoring	(1)Institute Advanced Environmental Effects Monitoring (2)Implement case specific management options (ie. Remediation, limits on quantities or types of material)
	Benthic Monitoring		Determine whether there are adverse changes in the benthic populations outside of the site and evaluate recovery rates		Adverse changes observed outside of the site that may endanger the marine environment		
Advanced Environmental Effects Monitoring	Tissue Chemical Analysis	EPA	Determine if the site is a source of adverse bioaccumulation which may endanger the marine environment	Implement if Environmental Effects Monitoring warrants	Benthic body burdens and risk assessment models indicate potential for food chain impacts	Discontinue monitoring	(1) Discontinue site use (2)Implement case specific management options (ie. Remediation, limits on quantities or types of material)
	Benthic Monitoring		Determine if the site is a source of adverse sub-lethal[2] changes in benthic organisms which may endanger the marine environment		Sub-lethal effects are unacceptable		

1. Significantly elevated: Concentrations above the range of contaminant levels in dredged sediments that the Regional Administrator and the District Engineer found to be suitable for disposal at the ODMDS.
2. Examples of sub-lethal effects include without limitation the development of lesions, tumors, development abnormality, and/or decreased fecundity.

3.4 Reporting and Data Formatting

3.4.1 Project Initiation and Unauthorized Discharge Reporting.
MVN should notify EPA within 15 days prior to the beginning of a dredging cycle or project disposal. Should an unauthorized discharge occur outside of the ODMDS boundaries, MVN will notify EPA Region 6 via email within a reasonable period of time upon discovery of the event.

3.4.2 Post Disposal Summary Report

A Post Disposal Summary Report will be provided to EPA Region 6 within 90 days after project completion (see Section 3.2).

The report should include the following:

- dredging project title;
- permit number and expiration date (if applicable);
- contract number;
- name of contractor(s) conducting the work,
- name and type of vessel(s);
- disposal timeframes for each vessel;
- estimated dredged material volumes placed,
- disposal event dates and locations;
- dates of pre- and post-disposal bathymetric surveys of the ODMDS; and
- a narrative discussing MVN's investigation of any unauthorized discharges.

The report will be in the form of a narrative with the following sections: 1) introduction, 2) description of dredging and disposal operations, 3) description of pre- and post-disposal bathymetry including synopsis of findings, and 4) a summary. The summary will include a table with the following columns: ID (row identifier), ODMDS, Date of Disposal, Gross Cubic Yards Placed, and Discharge Location (Latitude (North) and Longitude (West). The narrative should also include relevant figures or maps (depicting all discharge points) that support MVN's interpretation of project data. As-Built drawings with detailed construction information will be provided on CD.

If applicable, the report should also include a narrative discussing any unauthorized discharges, indicate the time it occurred and when it was reported to the EPA Region 6, discuss the circumstances surrounding the discharge, and identify specific measures taken to prevent reoccurrence.

3.5 Summary of Past Monitoring Survey Results

Previous surveys conducted regarding the Atchafalaya ODMDS-East and ODMDS-West are listed in Table 5. Results from investigations presented in the ODMDS East EIS, the ODMDS West EIS, and subsequent surveys will serve as a baseline for the monitoring of impacts from placement of dredged material within the ARBC ODMDS East and West locations. The existing data consists of multidisciplinary analyses including, but not limited to: water and sediment chemistry, sediment mapping, bathymetry, physical oceanographic conditions, and

biological studies related to benthic macroinvertebrates and fisheries. No adverse impacts to aquatic life have yet to be observed within the ODMDS or surrounding area.

3.6 Environmental Effects Monitoring Reporting

Other federal and state agencies, academia, and non-government organizations conduct research in the Atchafalaya Bay. EPA Region 6 and MVN will periodically review the findings of these groups or request data that are relevant to the navigation channel, ODMDS, and project area to improve our understanding of site environs. Conversely, EPA Region 6 and MVN should make every effort to provide project reports and data to interested parties upon request. New or existing information that is relevant to management of the ODMDS should be incorporated into future versions of this SMMP.

3.7 Future Monitoring Efforts

Changes in bathymetry at the ODMDS East or West will continue to be monitored in accordance with Section 3.3. Additionally, trend assessment surveys of the sediment, benthos and water column will continue to be performed periodically (approximately every 10 years) by EPA as budgets allow. Should future disposal at the ODMDS East or West result in unacceptable adverse impacts, further studies may be required to determine the persistence of these impacts, the extent of the impacts within the marine system, and/or possible means of mitigation. In addition, the management plan presented may require revision based on the outcome of any monitoring program.

4.0 SITE MANAGEMENT PLAN REVIEW AND REVISION

Pursuant to Section 102(c) of the MPRSA, as amended by WRDA 1992, the SMMP for the ARBC ODMDS East and West will be reviewed not less frequently than 10 years after adoption and every 10 years, thereafter.

Modifications or updates to the SMMP may be necessary, based on scheduled reviews, as specific needs are identified for the project, and/or if results from monitoring surveys or reports indicate that continued use of the ODMDS-East or -West would lead to unacceptable environmental impacts.

Modifications or updates to the SMMP may be proposed by the MVN or EPA Region 6. Following a 30-day review period of the proposed changes(s), the modifications may be incorporated into the plan by mutual consent of both agencies.

5.0 IMPLEMENTATION

This plan is effective from the date of signature for a period not to exceed 10 years as outlined in Section 3.4.

6.0 REFERENCES

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