



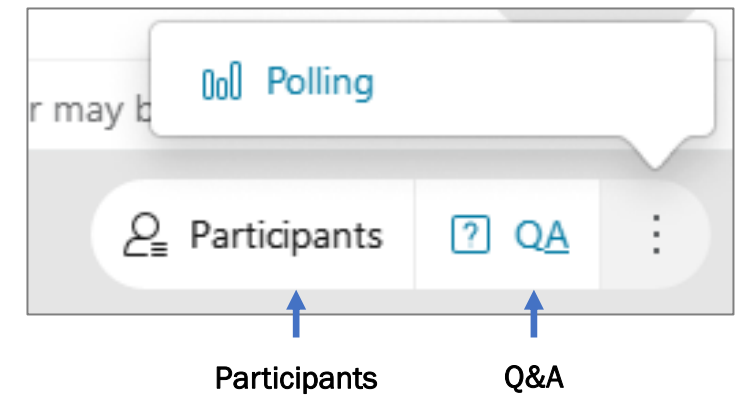
GREENHOUSE GAS REPORTING PROGRAM REVISIONS FOR PETROLEUM AND NATURAL GAS SYSTEMS FINAL AMENDMENTS

May 21, 2024

Call-in Details: 1-415-655-0002, ID 2439 235 2554

Webinar Panels

- We will use two panels
 - Participants and Question & Answer (Q&A)
 - Use the arrow to expand or collapse the panels
- Adding Panels
 - If some panels don't appear, select the desired panels in the lower right corner



Q&A

- Participants are muted
- Questions will be moderated at the end of the webinar
- To ask a question:
 - Select “All Panelists” from the drop-down menu
 - Enter your questions in the Q&A box
 - Hit “Send”

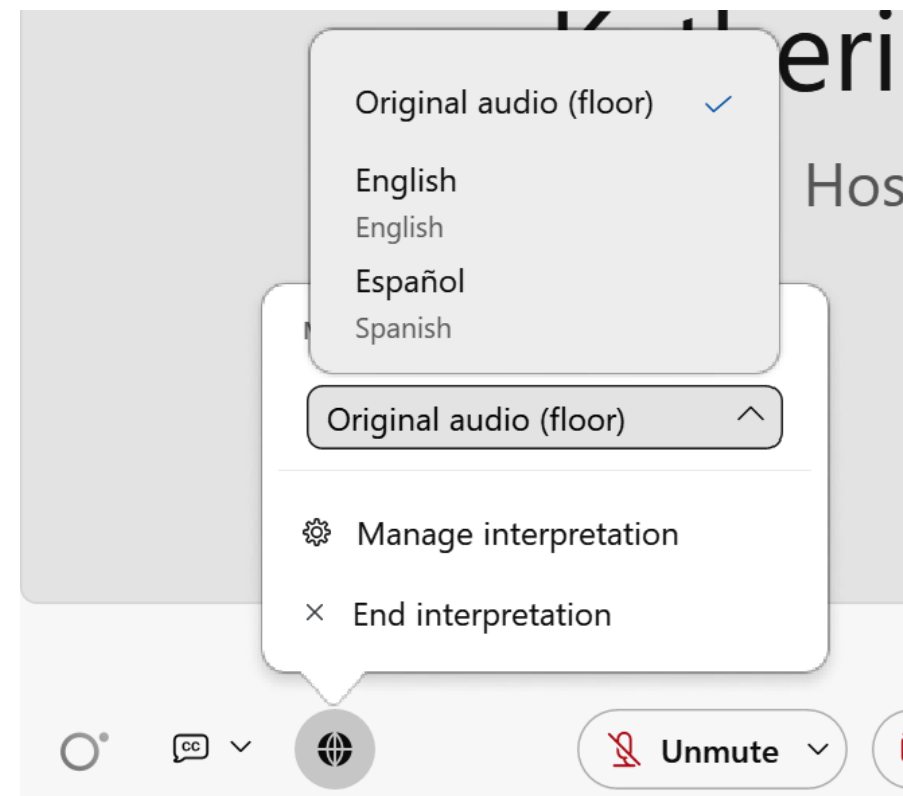


The screenshot shows a Q&A interface with a title bar that says "Q&A" and a close button. Below the title bar, there is a section labeled "All (0)". Underneath, there is a form with a label "Ask:" followed by a dropdown menu currently set to "All Panelists". Below the dropdown is a text input field containing the question "How can I get a copy of the slides?". To the right of the text input field is a "Send" button, which is circled in red. Two red arrows point to the dropdown menu and the text input field.

Technical difficulties: If you are having technical difficulties, please send a message through the [Q&A](#) box or email katherine.rush@abtglobel.com.

Interpretation

- Simultaneous interpretation is available in **Spanish**
- To join an interpretation channel:
 - Click on the globe icon
 - Select desired language
- You may switch back to the original audio at any time



Final materials will be posted to the EPA website: <https://www.epa.gov/ghgreporting/training-and-testing-opportunities-ghg-reporting#training-w>

Overview

- **Background**
- **Reflecting Total Methane Emissions:** New Emission Sources
- **Empirical Data and Increasing Accuracy:** New and Revised Emissions Calculation Methodologies
- **Improving Verification and Transparency:** Increased granularity in emissions reporting

Greenhouse Gas Reporting Program (GHGRP)

- Launched in response to Fiscal Year 2008 Consolidated Appropriations Act under Clean Air Act authority and codified at 40 CFR Part 98
- Annual reporting of greenhouse gas (GHG) data by 46 source categories
 - Covers a subset of oil and gas facilities; for example, about half of onshore oil and gas producing wells are subject to GHGRP
- For most subparts, including subpart W, facilities compare facility-level emissions to a 25,000 metric tons CO₂ equivalent (CO₂e) threshold to determine applicability
- Direct reporting to EPA electronically via EPA electronic GHG Reporting Tool (e-GGRT)
- EPA verification of GHG data

GHGRP Subpart W: Petroleum and Natural Gas Systems

Production & Processing

1. Onshore Petroleum & Natural Gas Production
2. Offshore Petroleum & Natural Gas Production
3. Total Crude Oil to Refineries
4. Petroleum Refining
5. Gathering and Boosting
*Data collection began in RY 2016
6. Gas Processing Plant
*May contain NGL Fractionation equipment
7. Natural Gas Liquids (NGL) Supply

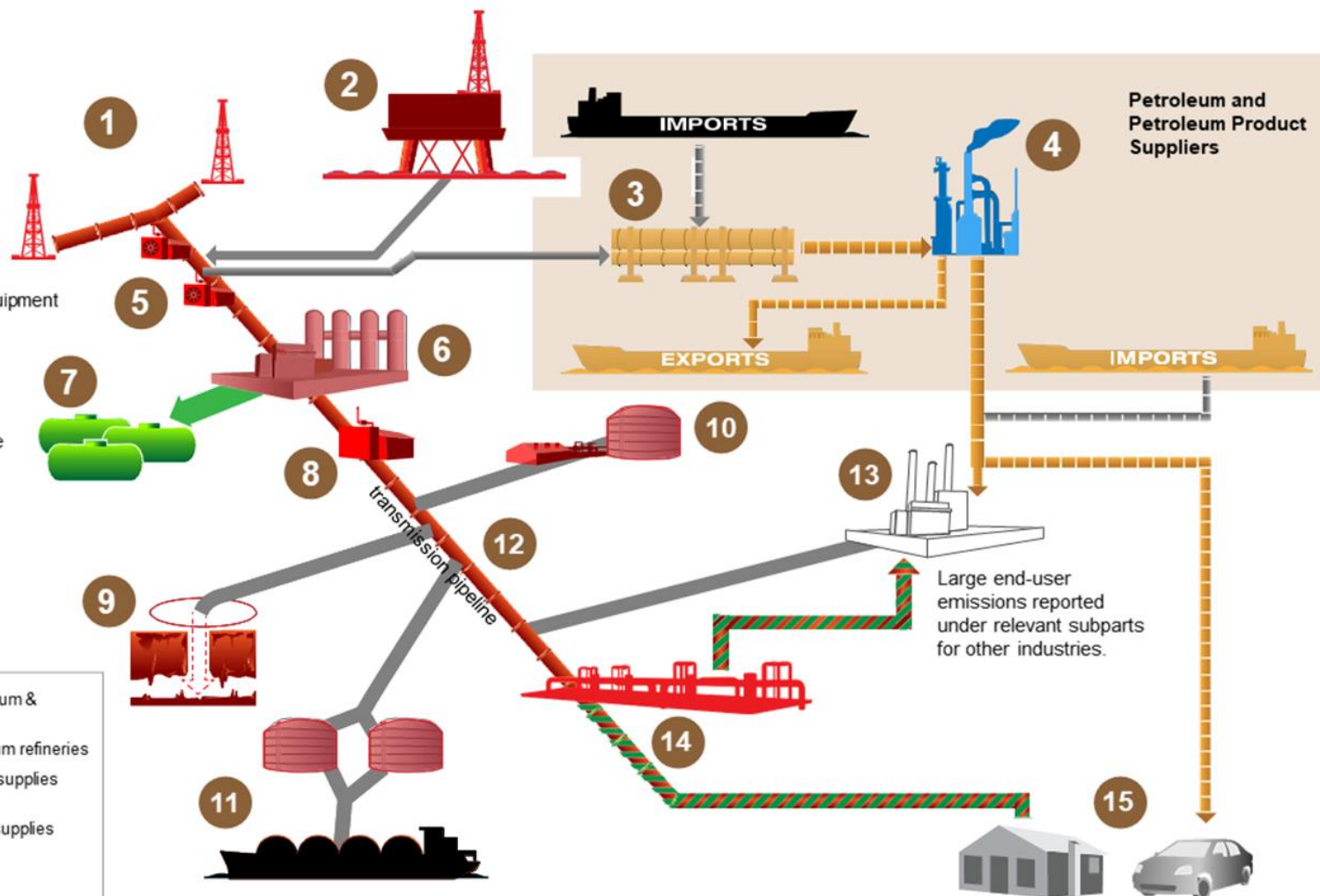
Natural Gas Transmission & Storage

8. Transmission Compressor Stations
9. Underground Storage
10. Liquefied Natural Gas (LNG) Storage
11. LNG Import-Export Equipment
12. Natural Gas Transmission Pipeline
*Data collection began in RY 2016

Distribution

13. Large End Users
14. Natural Gas Distribution
15. Natural Gas & Petroleum Supply to Small End Users

- **Subpart W:** Emissions from petroleum & natural gas systems
- **Subpart Y:** Emissions from petroleum refineries
- **Subpart MM:** CO₂ associated with supplies of petroleum products
- **Subpart NN:** CO₂ associated with supplies of natural gas & natural gas liquids
- Not reported under GHGRP



Subpart W Emissions Reporting

- Facilities are required to report under Subpart W if their annual emissions are more than 25,000 metric tons CO₂e from all applicable sources at the facility (e.g., Subpart W sources as well as combustion devices)
 - In general, a “facility” for purposes of the GHGRP means all co-located emission sources that are commonly owned or operated
 - However, certain industry segments have unique “facility” definitions, e.g., Onshore Production and Gathering and Boosting facilities report emissions at the basin level
- Facilities use methods specified by Part 98 to calculate GHG emissions, such as direct emissions measurement, engineering calculations with measurement of input parameters or emission factors derived from direct measurements published in scientific literature.
 - In many but not all cases, there is some flexibility in choice of emission calculation method
 - The specific sources subject to reporting differ by industry segment

Facility Definitions in Subpart W

- **Onshore Production**: all petroleum or natural gas equipment on a single well-pad or associated with a single well-pad and CO₂ EOR operations that are under common ownership or common control including leased, rented, or contracted activities by an onshore petroleum and natural gas production owner or operator and that are located in a single hydrocarbon basin as defined in § 98.238. Where a person or entity owns or operates more than one well in a basin, then all onshore petroleum and natural gas production equipment associated with all wells that the person or entity owns or operates in the basin would be considered one facility.
- **Gathering & Boosting**: all gathering pipelines and other equipment located along those pipelines that are under common ownership or common control by a gathering and boosting system owner or operator and that are located in a single hydrocarbon basin as defined in this section. Where a person owns or operates more than one gathering and boosting system in a basin (for example, separate gathering lines that are not connected), then all gathering and boosting equipment that the person owns or operates in the basin would be considered one facility. Any gathering and boosting equipment that is associated with a single gathering and boosting system, including leased, rented, or contracted activities, is considered to be under common control of the owner or operator of the gathering and boosting system that contains the pipeline. The facility does not include equipment and pipelines that are part of any other industry segment defined in this subpart.
- **Natural Gas Distribution**: the collection of all distribution pipelines and metering-regulating stations that are operated by a Local Distribution Company (LDC) within a single state that is regulated as a separate operating company by a public utility commission or that are operated as an independent municipally-owned distribution system.
- **Natural Gas Transmission Pipeline**: the total U.S. mileage of natural gas transmission pipelines, as defined in this section, owned and operated by an onshore natural gas transmission pipeline owner or operator as defined in this section. The facility does not include pipelines that are part of any other industry segment defined in this subpart.

Inflation Reduction Act: Clean Air Act Section 136 Methane Emissions Reduction Program

IRA provides new authorities under Clean Air Act Section 136 to reduce methane emissions from oil and gas

- **Creates an incentive program for financial and technical assistance.**
- **Establishes a waste emissions charge** for methane from applicable facilities that report more than 25,000 metric tons CO₂e per year to GHGRP Subpart W and that exceed statutorily-specified waste emissions thresholds.
 - Waste emissions charge starts at \$900 per metric ton for 2024 emissions and increases to \$1,200 for 2025 and \$1,500 for 2026 and thereafter.
 - Includes certain exemptions and flexibilities related to the waste emissions charge.
- **Directs EPA to revise requirements in subpart W**
 - To ensure reporting and calculation of charges are based on empirical data.
 - And to allow owners and operators to submit empirical emissions data, in a manner to be prescribed by the Administrator, to demonstrate the extent to which a charge is owed.
 - And to accurately reflect total methane and waste emissions.
 - By August 2024.

Overview of Final Revisions

- EPA finalized revisions to ensure that emissions reporting under subpart W is **based on empirical data** and allows owners and operators to submit appropriate empirical data to demonstrate the extent to which a charge is owed. Revisions include:
 - Additional direct measurement calculation methodologies, including optional use of relevant new calculation methodologies for reporting year 2024
 - Revisions to existing methodologies to require measurement of some related parameters, incorporate the latest data or improve the accuracy of emission calculations
 - Incorporation of data from remote sensing for other large release events
- EPA also finalized the **addition of emission sources** to ensure that subpart W **reflects total methane emissions** from the applicable facilities, including:
 - Adding entirely new sources (e.g., ‘Other large release events’)
 - Expanding reporting of existing sources to all relevant segments
- EPA also finalized revisions to **improve data verification and transparency**, including increasing the granularity of reporting for Onshore Petroleum & Natural Gas Production and Gathering & Boosting
 - Many data elements will be reported at the well, well-pad site or gathering and boosting site level
- This final rule also finalizes revisions to the general provisions (subpart A) and the general stationary fuel combustion (subpart C) source category of the Greenhouse Gas Reporting Rule

Overview of Final Revisions: Effective Date

- Most revisions will become effective on January 1, 2025 for submission of reporting year 2025 report submitted by March 31, 2026.
- One exception is the reporting of the quantities of natural gas and crude oil that is sent to sale in the calendar year for each well permanently shut-in and plugged; those provisions also become effective on January 1, 2025, but reporters must include that information in 2024 annual reports.
- Some calculation methods become effective for the 2024 reporting year as optional methods. These optional calculation methods become effective July 15, 2024 and provide reporters with the option to use these newly available calculation methods for their 2024 annual reports that are submitted March 31, 2025. A list of these methods is in Table 5 of the preamble to the final rule.



REFLECTING TOTAL METHANE EMISSIONS

New Sources: Other large release events, mud degassing, crankcase venting, produced water tanks, nitrogen removal units
And new reporting of existing sources under additional segments

Additional Industry Segment Reporting for Existing Source Types

* = These segments report combustion emissions under Subpart C
 Blue Check = new emissions source for the segment, effective for RY25

| Industry Segment | Pneumatic Devices | Pneumatic Pumps | Acid Gas Removal | Dehydrators | Liquids Unloading | Completions & Workovers with HF | Completions & Workovers without HF | Blowdown Vents | Hydrocarbon Liquids Storage Tanks | Condensate Storage Tanks | Well Testing | Associated NG | Flare Stacks | Centrifugal Compressors | Reciprocating Compressors | Equipment Leaks | Offshore | EOR Injection Pumps | EOR CO2 in Hydrocarbon Liquids | Combustion Equipment |
|--------------------------|-------------------|-----------------|------------------|-------------|-------------------|---------------------------------|------------------------------------|----------------|-----------------------------------|--------------------------|--------------|---------------|--------------|-------------------------|---------------------------|-----------------|----------|---------------------|--------------------------------|----------------------|
| Offshore Production | | | | | | | | | | | | | | | | | ✓ | | | * |
| Onshore Production | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| NG Processing | ✓ | | ✓ | ✓ | | | | ✓ | ✓ | | | | ✓ | ✓ | ✓ | ✓ | | | | * |
| Transmission Compression | ✓ | | | ✓ | | | | ✓ | | ✓ | | | ✓ | ✓ | ✓ | ✓ | | | | * |
| Underground Storage | ✓ | | | ✓ | | | | ✓ | | ✓ | | | ✓ | ✓ | ✓ | ✓ | | | | * |
| LNG Storage | | | ✓ | | | | | ✓ | | | | | ✓ | ✓ | ✓ | ✓ | | | | * |
| LNG Import/Export | | | ✓ | | | | | ✓ | | | | | ✓ | ✓ | ✓ | ✓ | | | | * |
| NG Distribution | ✓ | | | | | | | ✓ | | | | | | | | ✓ | | | | ✓ |
| Gathering & Boosting | ✓ | ✓ | ✓ | ✓ | | | | ✓ | ✓ | | | | ✓ | ✓ | ✓ | ✓ | | | | ✓ |
| Transmission Pipeline | | | | | | | | ✓ | | | | | | | | ✓ | | | | |

Other Large Release Events

- Background:
 - Multiple studies asserting large, episodic releases as significant fraction of total emissions
- Final amendments:
 - Applies to all 10 industry segments
 - Defined, in part as, “any planned or unplanned uncontrolled release to the atmosphere of gas, liquids, or mixture thereof, from wells and/or other equipment that result in emissions for which there are no [other] methodologies [in subpart W] that appropriately estimate these emissions”
 - Does not include blowdowns (which is already covered under the blowdown source category).
 - Threshold of 100 kg/hr emission rate
 - Reporting includes location (lat/long coordinates) and information to improve verification and transparency
 - Duration of event is tied to monitoring or survey data, including data from advanced screening methods, if available; If not, must use a default start date of 91-days prior to identification
 - Monitoring data may include monitored process parameters, such as data available from SCADA systems, continuous monitoring systems or other advanced screening methods such as monitoring systems mounted on satellites or airplanes
 - Clarified methodology to avoid double counting of emissions during the timespan of the event when there is an associated source-specific calculation methodology in subpart W

Reporting of GHG Emissions Associated with Super Emitter Program Notifications

- ‘Other Large Release Events’ source category is aligned with final New Source Performance Standards (NSPS)/Emission Guidelines (EG) super-emitter program, including reporting of NSPS/EG event ID (if applicable)
- All Super Emitter Program notifications associated with a subpart W facility must be reported in Greenhouse Gas Reporting Program annual reports under subpart W
- Emissions associated with each Super Emitter Program notification must be quantified and reported under subpart W, either under the ‘other large release events’ source category or another existing category, as appropriate, except in the following cases:
 - Owners and operators certify that the facility does not own or operate equipment at the location
 - Or EPA has determined that the notification contains a demonstrable error

Additional New Sources

- Conducted review of other inventories of oil and gas industry emissions, including U.S. GHG Inventory, American Petroleum Institute (API) Compendium, and stakeholder feedback to identify missing sources of emissions from subpart W.
- New sources:
 - Crankcase Venting
 - Finalizing a measurement calculation method in addition to finalizing the proposed emission factor method
 - Produced Water Tanks
 - Nitrogen Removal Units
 - Mud Degassing
- Addition of emissions from existing source types:
 - CH₄ from Acid gas removal units (2024 and earlier report CO₂ only)
 - Methane slip from Combustion units

New Emission Sources by Industry Segment

(Effective for reporting year 2025 and later)

| Industry Segment | Mud Degassing | Produced Water Tanks | Nitrogen Removal Units | Crankcase Venting | Other Large Release Events |
|--------------------------|---------------|----------------------|------------------------|-------------------|----------------------------|
| Offshore Production | | | | | ✓ |
| Onshore Production | ✓ | ✓ | ✓ | ✓ | ✓ |
| NG Processing | | ✓ | ✓ | ✓ | ✓ |
| Transmission Compression | | | | ✓ | ✓ |
| Underground Storage | | | | ✓ | ✓ |
| LNG Storage | | | ✓ | ✓ | ✓ |
| LNG Import/ Export | | | ✓ | ✓ | ✓ |
| NG Distribution | | | | ✓ | ✓ |
| Gathering & Boosting | | ✓ | ✓ | ✓ | ✓ |
| Transmission Pipeline | | | | | ✓ |



INCORPORATING ADDITIONAL EMPIRICAL DATA AND IMPROVING ACCURACY

Overview of selected new and revised calculation methodologies

Subpart W Calculation Method Types

| | Pneumatic Devices | Pneumatic Pumps | Acid Gas Removal | Dehydrators | Liquids Unloading | Completions & Workovers with HF | Completions & Workovers without HF | Blowdown Vents | Hydrocarbon Liquids Storage Tanks | Condensate Storage Tanks | Well Testing | Associated NG | Flare Stacks | Centrifugal Compressors | Reciprocating Compressors | Equipment Leaks | EOR Injection Pumps | EOR CO ₂ in Hydrocarbon Liquids | Combustion Equipment |
|--|-------------------|-----------------|------------------|-------------|-------------------|---------------------------------|------------------------------------|----------------|-----------------------------------|--------------------------|--------------|---------------|--------------|-------------------------|---------------------------|-----------------|---------------------|--|----------------------|
| Direct Emissions Measurement | ✓ | ✓ | ✓ | | | | ✓ | ✓ | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ |
| Measurement + Engineering Calculations | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ |
| Engineering Calculations | | | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | | ✓ | ✓ | ✓ | | | | ✓ | | ✓ |
| Emission Factors | ✓ | ✓ | | ✓ | | | ✓ | | ✓ | | | | | ✓ | ✓ | ✓ | | | ✓ |

EOR = Enhanced Oil Recovery; HF = Hydraulic Fracturing; NG = Natural Gas

Red check marks indicate that the final rule includes a calculation methodology in a new calculation method category for that source type (e.g., final rule includes a direct measurement option where subpart W currently requires use of an emission factor).

Blue check marks indicate that the final rule adds a second type of calculation methodology in this category (e.g., adding a leaker emission factor option to the “Emission Factors” category for a source type that currently has population emission factors).

Natural Gas Pneumatic Device Venting: Final Amendments

- New direct measurement calculation methods
 - Additional calculation method based on direct measurement of natural gas supplied to pneumatic devices and/or pneumatic pumps vented directly to the atmosphere
 - Additional calculation method based on measurements of the natural gas emissions from each pneumatic device or pneumatic pump vented directly to the atmosphere
 - Specification of calculation methodology and reporting provisions for vents routed to control (*i.e.*, flares, combustion, or vapor recovery systems)
- Revised leaker and population emission factors
 - Leaker factor calculation method for intermittent bleed (IB) devices: Addition of provisions to calculate emissions from IB devices based on inspections or surveys (leaker factors)
 - Population Factors: Revisions to the pneumatic device vent emission factors for IB devices, continuous low bleed devices, and continuous high bleed devices based on emissions measurement studies

Flare Stack Emissions: Final Amendments

- Final revisions to flare calculation methodologies:
 - Revision to **destruction**/combustion efficiencies
 - Option to use advanced technologies to develop flare-specific efficiencies if an alternative test method is approved in accordance with NSPS 0000b procedures
 - **98%/96.5%** if implementing provisions consistent with NESHAP CC
 - **95%/93.5%** if implementing provisions consistent with NSPS 0000b
 - **92%/90.5%** for all other flares
 - Requirement to determine presence of pilot flame or combustion flame via continuous monitoring or monthly visual inspection
 - Determinations of volume and composition of gas routed to the flare similar to current requirements
 - Finalized options that include measurement of volume via flow meter, continuous parameter monitoring or engineering calculations
 - Finalized options that include measuring composition via continuous gas composition analyzer, quarterly compositional analysis, or engineering calculations

Equipment Leak Surveys: Final Amendments

- Addition of new calculation methods:
 - Direct measurement of equipment leaks
 - Development of facility-specific leaker emission factors
- Survey method-specific leaker factors
 - Addition of default leaker emission factors for other survey methods (optical gas imaging (OGI), infrared laser beam illuminated instrument, and acoustic leak detection device)
- Accounting for undetected leaks: Addition of a method-specific adjustment factor, k , into the emission factor-based calculation methods
- Addition of cross-references to final NSPS 0000b and 40 CFR part 62
 - Well sites, compressor stations, and natural gas processing plants will be required to use completed fugitive emissions components/equipment leak survey results for subpart W

Effective Date for New Calculation Methodologies

- A number of optional additional calculation methods and other provisions that allow owners and operators of applicable facilities to submit empirical emissions data, consistent with CAA section 136(h), will be effective for RY 2024 as optional calculation methods.
- Examples of methods that will be effective and available for RY 2024 include:
 - Use of continuous flow measurement devices for associated gas venting and flaring, and for gas supplied to pneumatic devices and pumps
 - Measurement of the volumetric flow rate of each source for pneumatic devices and pumps, equipment leaks, and compressors in the onshore production and gathering & boosting segments
 - Monitoring to identify malfunctioning pneumatic devices
 - Use of multiphase flow meters for completions and workovers with hydraulic fracturing
 - Development of facility-specific leaker emission factors
 - For offshore, use of BOEM calculation methods for years between BOEM data collections
- Other provisions effective for RY 2024 revise the applicability for existing methods (e.g., allow small dehydrators and small storage tanks to use modeling rather than requiring use of emission factors)



IMPROVING VERIFICATION AND TRANSPARENCY

Increase in granularity of reporting for basin-level facilities

Disaggregation for Certain Industry Segments

- Background:
 - Currently, emissions and activity data reported by each facility for the Onshore Production and Gathering and Boosting industry segments are aggregated to the basin, county/sub-basin, or unit level (depending upon the specific emission source)
 - Challenging to verify reported data and ensure data quality; limits data transparency
- Final Amendments:
 - Additional reported data elements of Well-pad ID and Gathering and Boosting Site ID (depending upon industry segment)
 - Associated revisions to reporting requirements for emission sources to report by well, well-pad site or gathering and boosting site instead of currently aggregated reporting at the sub-basin / basin level

Amended Industry Segment Definitions

- **Onshore Natural Gas Processing:** ~~the separation of natural gas liquids (NGLs) or non-methane gases from produced natural gas, or the separation of NGLs into one or more component mixtures. Separation includes one or more of the following:~~ forced extraction of natural gas liquids (NGLs) from field gas, sulfur and carbon dioxide removal, fractionation of mixed NGLs to natural gas products, or both ~~the capture of CO₂ separated from natural gas streams.~~ Natural gas processing does not include a Joule-Thomson valve, a dew point depression valve, or an isolated or standalone Joule-Thomson skid. This segment also includes all residue gas compression equipment owned or operated by the natural gas processing plant. ~~This industry segment includes processing plants that fractionate gas liquids, and processing plants that do not fractionate gas liquids but have an annual average throughput of 25 MMscf per day or greater.~~
- **Gathering & Boosting:** gathering pipelines and other equipment used to collect petroleum and/or natural gas from onshore production gas or oil wells and used to compress, dehydrate, sweeten, or transport the petroleum and/or natural gas to a downstream endpoint, typically a natural gas processing facility, a natural gas transmission pipeline or to a natural gas distribution pipeline. Gathering and boosting equipment includes, but is not limited to gathering pipelines, separators, compressors, acid gas removal units, dehydrators, pneumatic devices/pumps, storage vessels, engines, boilers, heaters, and flares. Gathering and boosting equipment does not include equipment reported under any other industry segment defined in this section. Gathering pipelines operating on a vacuum and gathering pipelines with a GOR less than 300 standard cubic feet per stock tank barrel (scf/STB) are not included in this industry segment (oil here refers to hydrocarbon liquids of all API gravities).

Resources

- For more information on the GHGRP:
 - <https://www.epa.gov/ghgreporting>
- For more information on the Final Amendments to Subpart W:
 - <https://www.epa.gov/ghgreporting/rulemaking-notice-ghg-reporting>
 - The final rule and other background information is also available electronically at <https://www.regulations.gov>, EPA's electronic public docket and comment system (Docket ID No. EPA-HQ-OAR-2023-0234).
- To ask questions that were not answered in today's webinar, contact the GHGRP Help Desk:
 - Email ghgreporting@epa.gov
 - <https://www.epa.gov/ghgreporting/forms/contact-us-about-ghg-reporting>