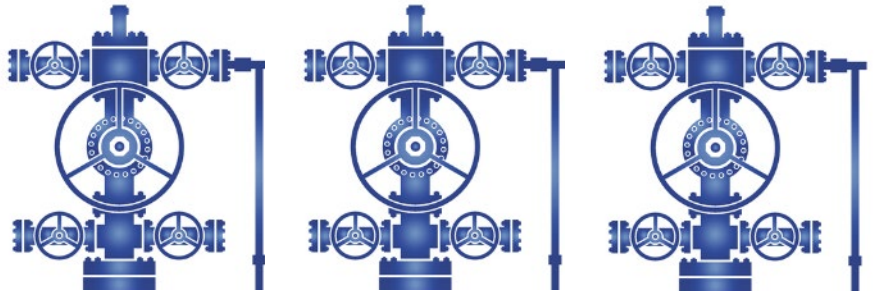
EPA's Final Rule to Reduce Methane and Other Harmful Pollution from Oil and Natural Gas Operations

NACAA Climate Change Committee Meeting

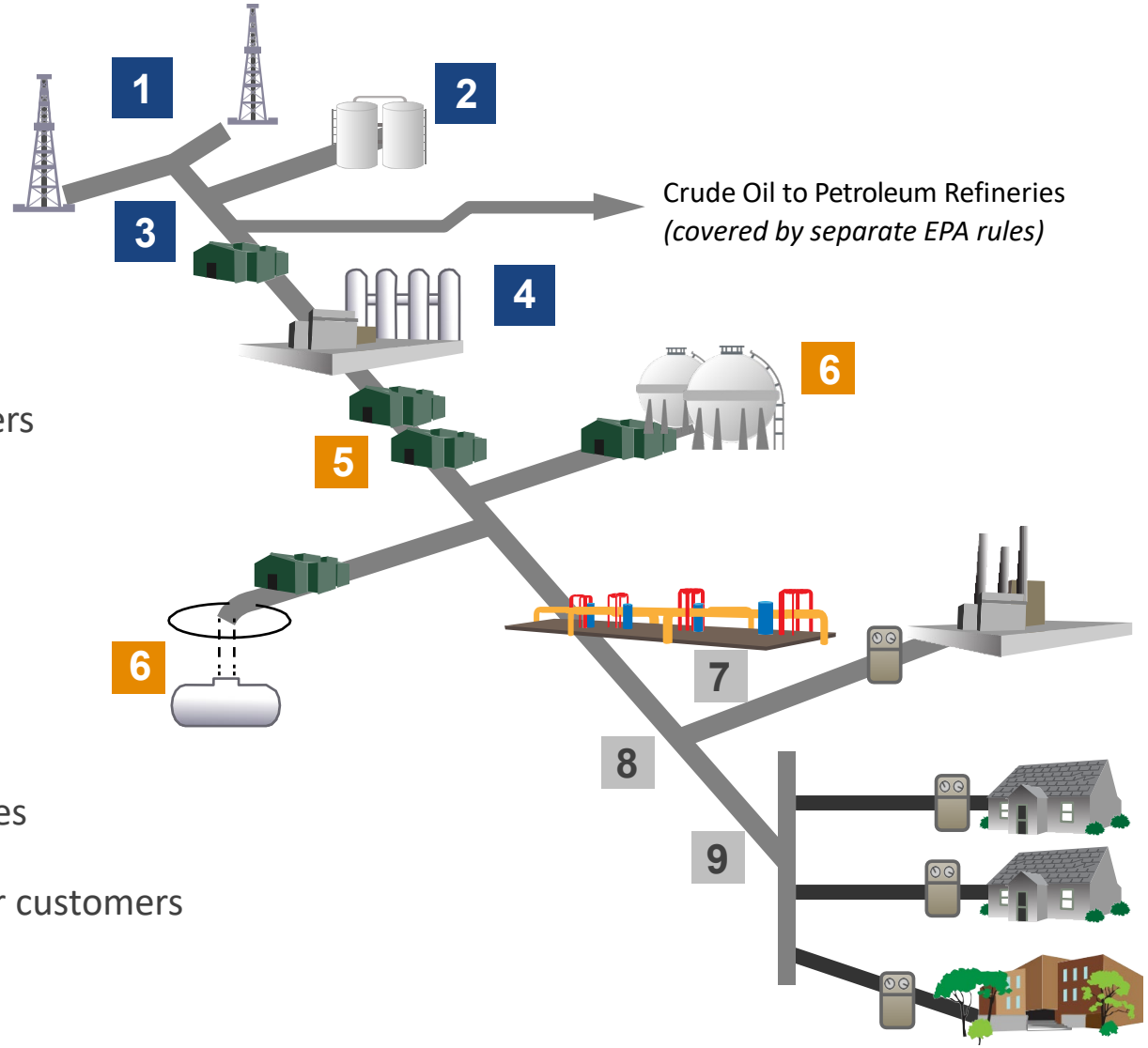
January 10, 2024



Agenda for Today's Meeting

- Rule Applicability
- The Final Rule: Highlights
- Super Emitter Program
- Advanced Methane Detection Technology Work Practices
- State Plans
- Health and Climate Benefits
- Emission Reductions
- Addressing your concerns

Crude Oil and Natural Gas Operations: Where EPA's Rules Apply



Production & Processing

EPA's methane proposal covers equipment & processes at:

1. Onshore well sites
2. Storage tank batteries
3. Gathering & boosting compressor stations
4. Natural gas processing plants

Natural Gas Transmission & Storage

EPA's methane proposal covers equipment & processes at:

5. Compressor stations
6. Storage tank batteries

Distribution

(not covered by EPA rules)

7. Distribution mains/services
8. City gate
9. Regulators and meters for customers

Figure adapted from American Gas Association and EPA's Natural Gas STAR Program

EPA United States Environmental Protection Agency

Oil and Natural Gas Sources Covered by EPA's Final New Source Performance Standards (NSPS) and Emissions Guidelines, by Site

Location and Equipment or Process Covered	Required to or Would Be Required to Reduce Emissions under EPA Rules (if finalized as proposed)	Rules that Apply			
		2012 NSPS for VOCs (OOOO)	2016 NSPS for Methane & VOCs (OOOOa)	2023 Final NSPS for Methane & VOCs (OOOOb)	2023 Final Emissions Guidelines for Methane (OOOOc)
Oil and Natural Gas Well Sites					
Completions of hydraulically fractured wells	✓	●	●	●	
Compressors at centralized tank batteries	✓			●	●
Fugitive emissions	✓		●	●	●
Liquids unloading	✓			●	●[1]
Pneumatic controllers	✓	●	●	●	●
Pneumatic pumps	✓		●	●	●
Storage vessels	✓	●	●[3]	●	●
Sweetening units	✓	●[2]	●[2]	●[2]	●[2]
Associated gas from oil wells	✓			●	●
Natural Gas Gathering and Boosting Compressor Stations					
Compressors	✓	●	●	●	●
Fugitive emissions	✓		●	●	●
Pneumatic controllers	✓	●	●	●	●
Pneumatic pumps	✓			●	●
Storage vessels	✓	●	●[3]	●	●
Sweetening units	✓	●[2]	●[2]	●[2]	●[2]
Natural Gas Processing Segment					
Compressors	✓	●	●	●	●
Fugitive emissions	✓		●	●	●
Pneumatic controllers	✓	●	●	●	●
Pneumatic pumps	✓		●	●	●
Storage vessels	✓	●	●[3]	●	●
Sweetening units	✓	●[2]	●[2]	●[2]	●[2]
Transmission and Storage Segment					
Compressors	✓		●	●	●
Fugitive emissions	✓		●	●	●
Pneumatic controllers	✓		●	●	●
Pneumatic pumps	✓			●	●
Storage vessels	✓	●	●[3]	●	●

All of the sources listed above are covered by EPA's Super Emitter Program

[1] Added in 2022 supplemental proposal

[2] Covered for SO_2 only

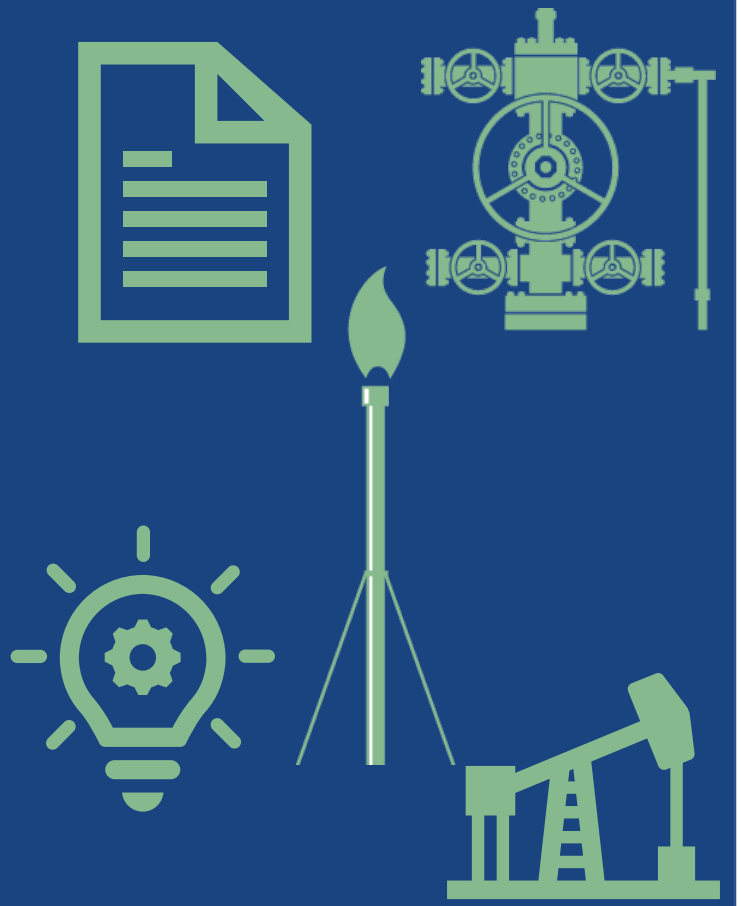
[3] Covered for VOCs only

Applicability and Effective Date

Subpart	Source Type	Applicable Dates
40 CFR part 60, subpart OOOO	New, modified, or reconstructed sources	After August 23, 2011, and on or before September 18, 2015
40 CFR part 60, subpart OOOOa	New, modified, or reconstructed sources	After September 18, 2015, and on or before December 6, 2022
40 CFR part 60, subpart OOOOb	New, modified, or reconstructed sources	After December 6, 2022
40 CFR part 60, subpart OOOOc	Existing sources	On or before December 6, 2022

The Effective Date for this ruling is 60 days after *Federal Register* publication

Final Rule: Key Improvements



Incentivizes Alternative Technology

- Promotes the use of innovative/sensitive technologies to find and reduce emissions faster and more efficiently

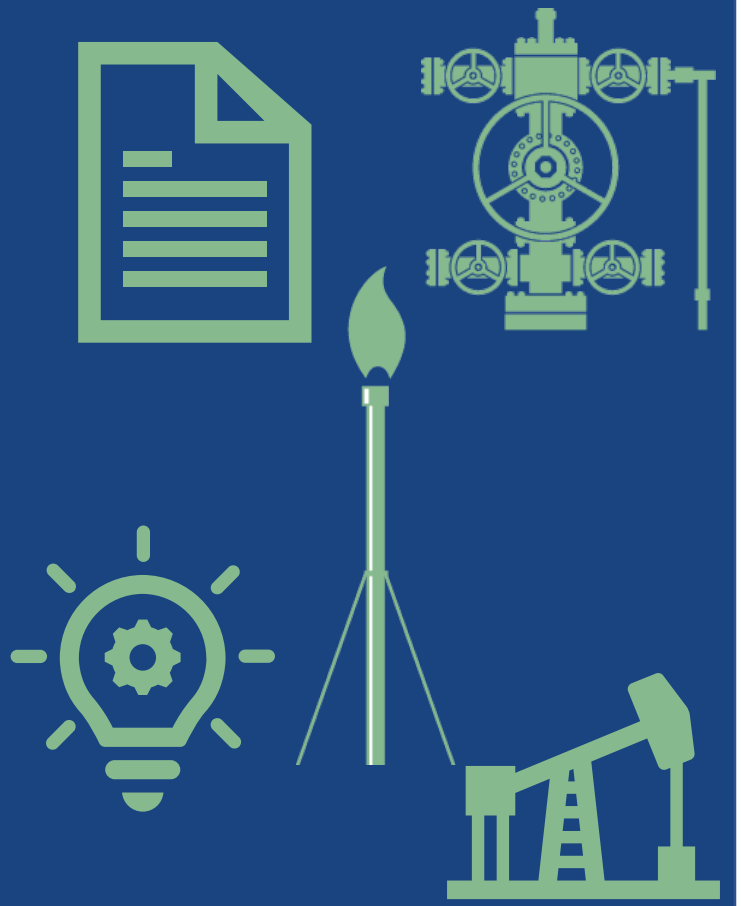
Strengthens Requirement for Associated Gas

- But provides industry with the time and flexibility needed to cost-effectively meet them

Super-Emitters

- New program designed by EPA to address Super-Emitters

Final Rule: Improvements to Ensure Reliable Compliance



Fugitives and Alternative Technology

- Strengthen and improve flexibility to bolster us of innovative technologies and reduce emissions

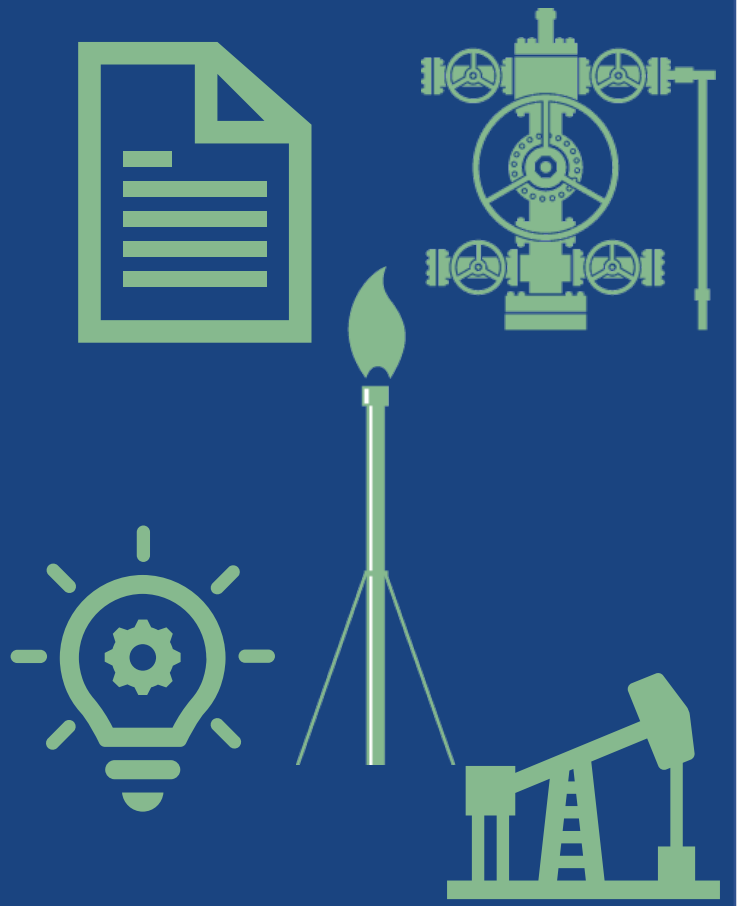
Monitoring Control Devices

- Refined monitoring to better confirm continual compliance

Super-Emitter Program

- Strengthen legal defensibility and better implementation

Final Rule: Specific Source Improvements



Storage Vessels

- Clarifies and increases accountability of operators

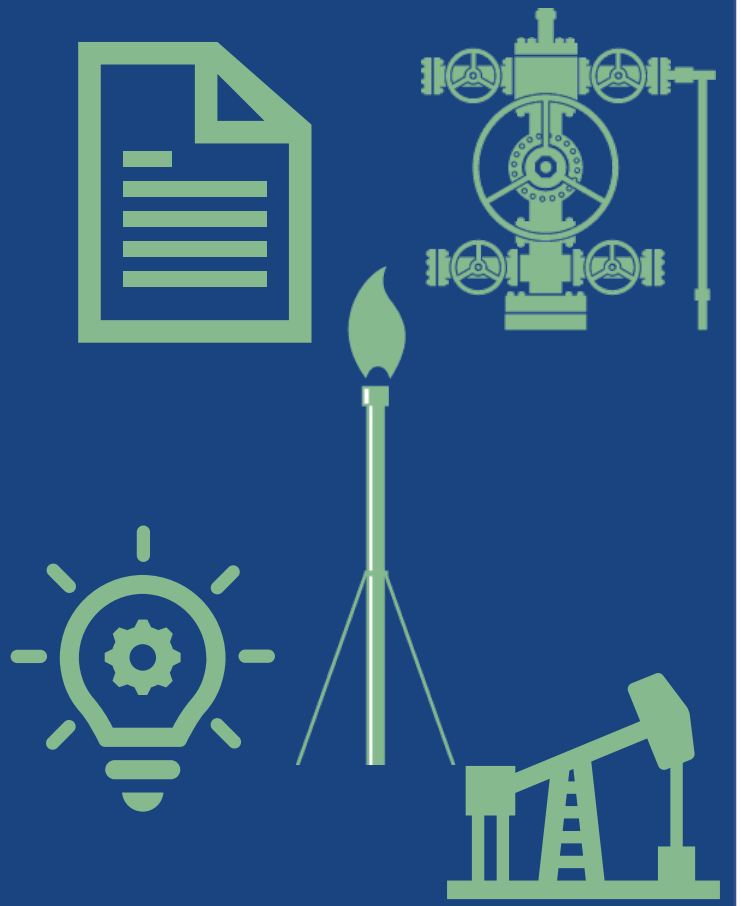
Associated Gas

- Prohibits routine flaring

Pneumatic Pumps

- Finalize standards of zero

Adjustments Based on Comments Received



Reciprocating Compressors (improved)

- Volumetric flow rate of 2scfm
- Increase flexibility by allowing for two alternatives in lieu of measurement

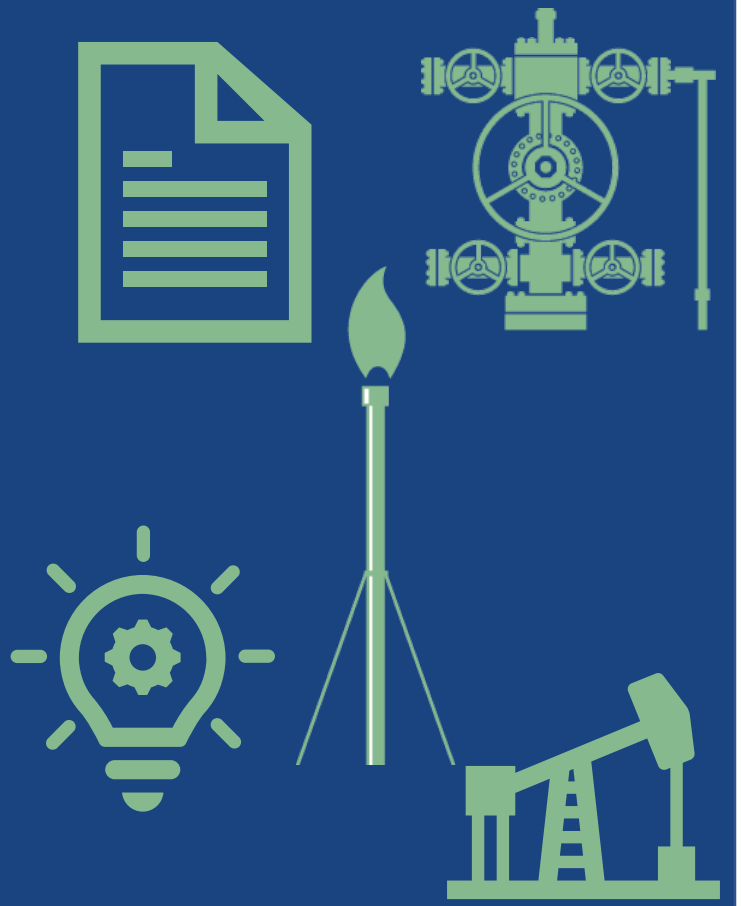
Wet Seal Centrifugal Compressors (As proposed)

- NSPS: 95 percent reduction of VOC & methane
- Existing: Volumetric flow rate of 3 scfm

Adjusted Standards in Response to Technical Comments

- Wet seal centrifugal compressors in Alaska (existing)
- Dry seal centrifugal compressors (new & existing)

The Final Rule: Overview



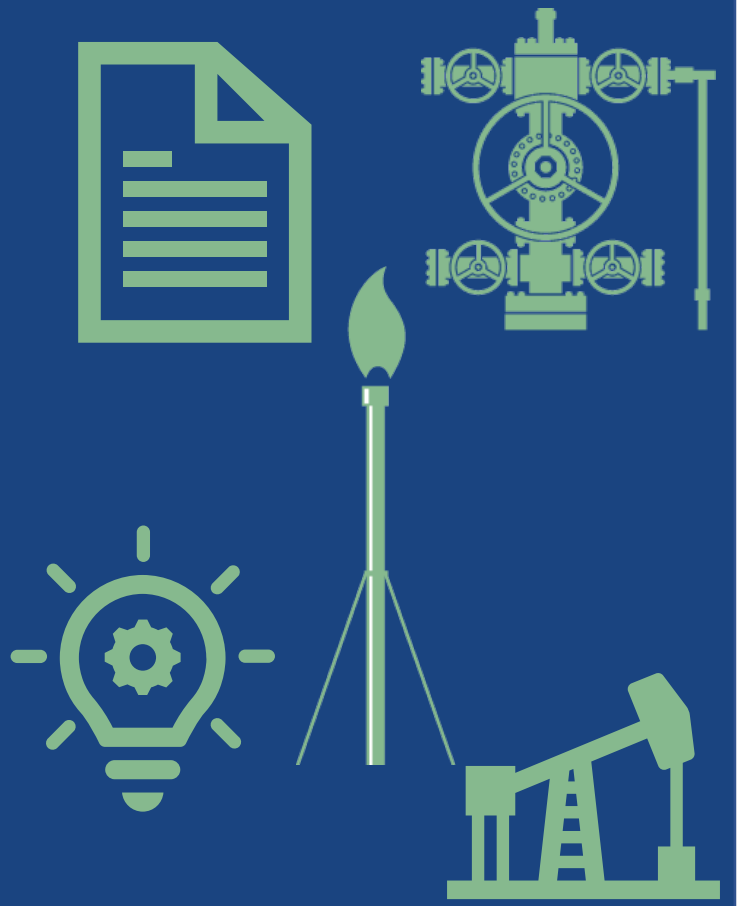
Recognizes and Encourages Innovation

- Provides owners and operators the flexibility to use a range of advanced monitoring technologies to identify leaks at well sites, centralized production facilities, and compressor stations

Contributes to Significant Methane Reductions

- Will ensure that all well sites, centralized production facilities, and compressor stations are routinely monitored for leaks.

The Final Rule: Overview



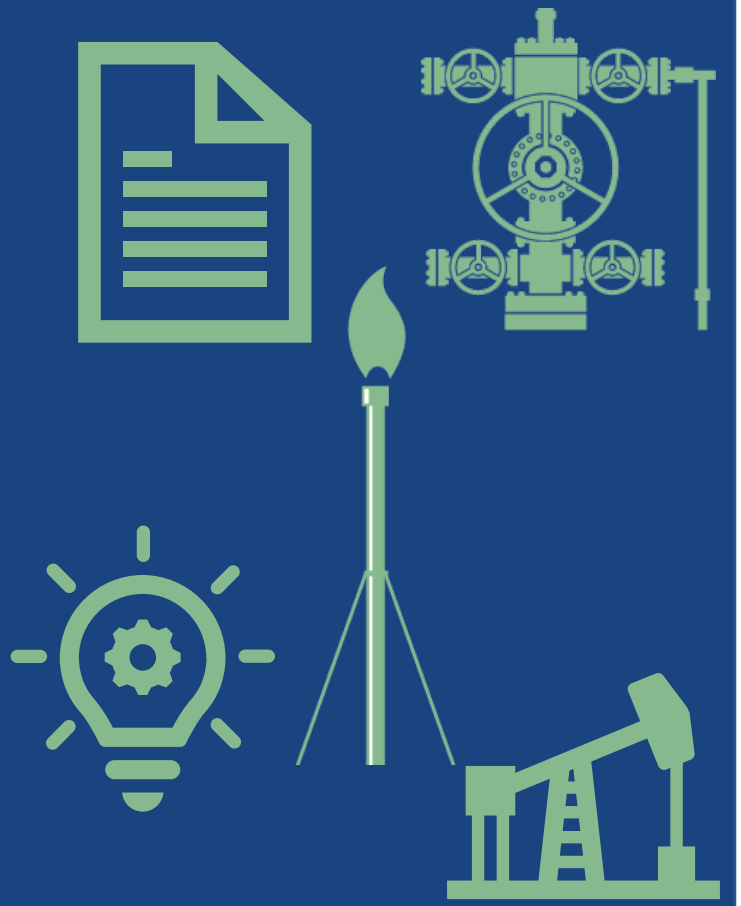
Regulates Process Controllers and Pumps (Pneumatic)

- Tough standards that provide time for industry to adjust in a smooth way

Ensures All Wells Are Monitored for Leaks, with More Options for Using Advanced Technology

- Wells are one of the largest sources of methane covered by the rule

The Final Rule: Overview



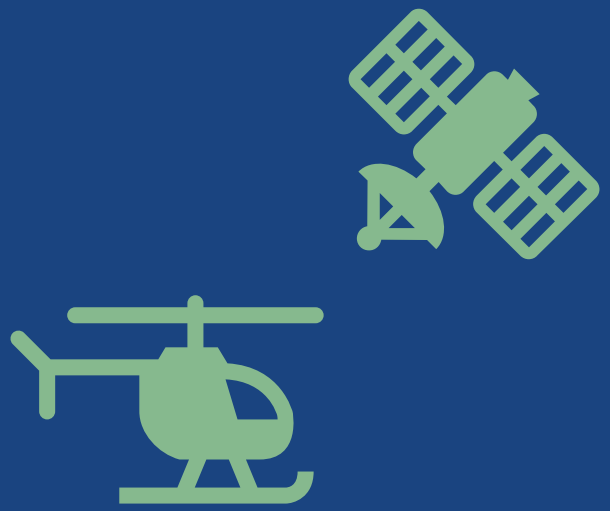
Provides Additional Flexibility While Ensuring Emissions Reductions

- Includes several changes that will reduce burden for industry while ensuring necessary emissions reductions.

Creates Super Emitter Program

- This program leverages third-party expertise to find large leaks and releases, which are responsible for as much as half of the methane emissions from oil and natural gas operations

The Super Emitter Program: Background



What is a Super Emitter?
What qualifies as a Super Emitter Event?

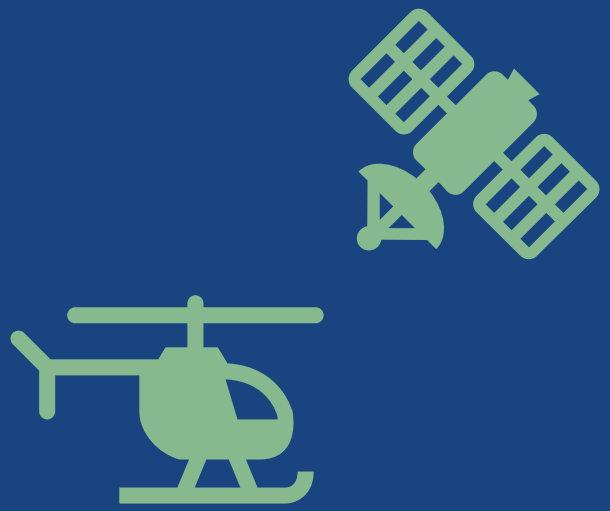
- Super Emitter = 100kg/hr methane leak/uncontrolled release

- Super Emitter Event = If subject to regulation under NSPS OOOO/a/b or EG OOOOc

The Super Emitter Program: Background

- Leverages 3rd party expertise to find large leaks and releases known as “super emitters”
- The EPA will provide a strong oversight role and ensure the program operates with a high degree of integrity, transparency, and accountability
- Only EPA-approved remote-sensing technologies may be used.
- Super Emitter data will be made publicly available by the EPA on a timely basis

The Super Emitter Program: Background

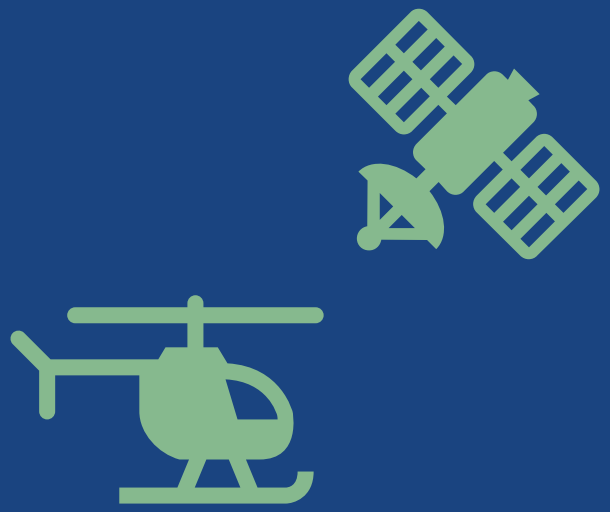


A Super-Emitter event may have been emitted from one or more of the following:

- An affected facility or associated equipment subject to regulation under NSPS OOOO, OOOOa, or OOOOb
- A designated facility or associated equipment subject to a state or Federal Plan promulgated pursuant to EG OOOOc
- An unregulated source

Therefore, the investigation is not limited to NSPS or EG sources

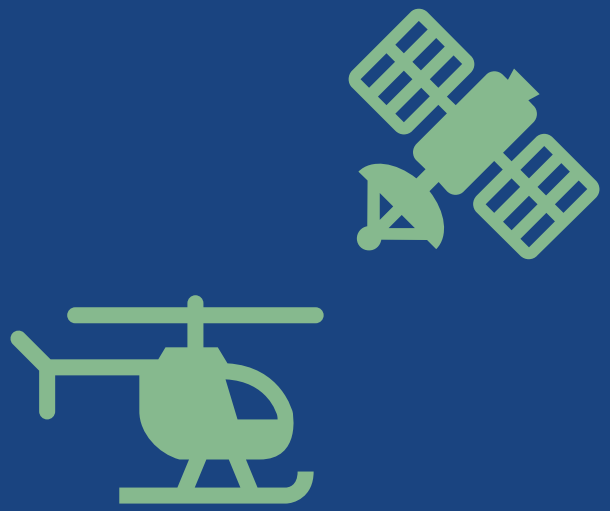
The Super Emitter Program: 3rd Party Identifiers



Qualifications for 3rd Party Identifiers

- Can be any independent entity
- Must use EPA-approved remote sensing technologies
- Are not authorized to enter a site

The Super Emitter Program: Certification of 3rd Party Identifiers



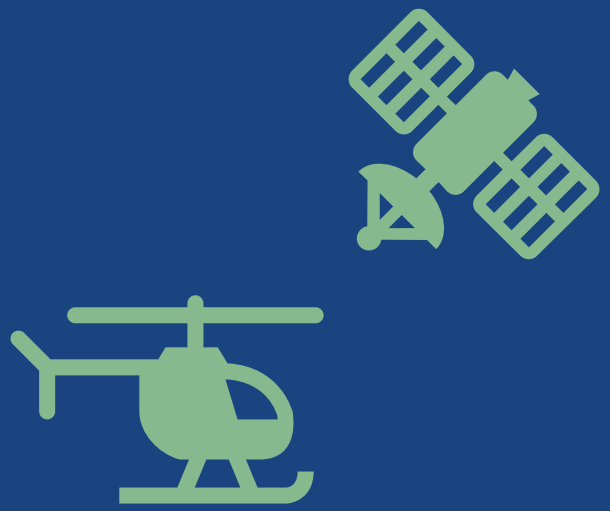
Certification of 3rd Party Identifiers

- A third-party notifier certification request must be submitted to the *Leader, Measurement Technology Group, 109 T.W. Alexander Drive, P.O. Box 12055, Research Triangle Park, NC 27711*.

The certification request must include:

- General Identification
- Description of advanced methane detection technologies
- Curriculum vitae
- Standard operating procedure(s)
- Description of the system
- A Quality Management Plan

The Super Emitter Program: Certification of 3rd Party Identifiers



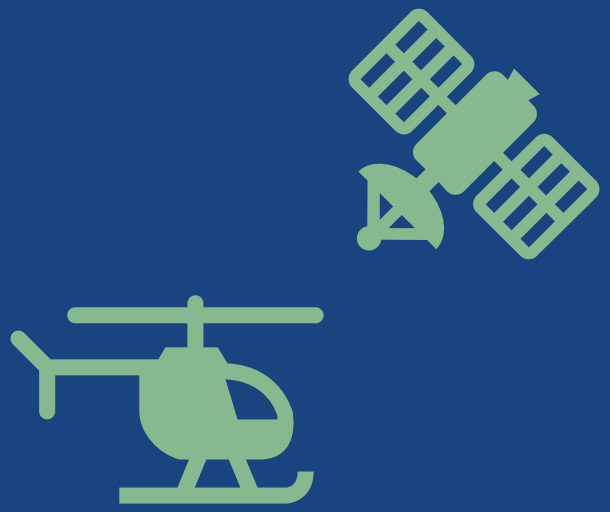
Upon approval

- **The entity must maintain the following records in order to retain certification status:**
  - Records for all surveys conducted or sponsored
  - Record of any notification to the EPA
  - Records or identification of databases used

- **The Administrator will assess the completeness, reasonableness, and accuracy of the 3rd party's request based on the updated certification criteria in the final rule.**

- **Once certified, the 3rd party notifier will receive a unique notifier ID which will be posted at *www.epa.gov/emc/third-party-certifications***

The Super Emitter Program: Notification of Super-Emitter Events

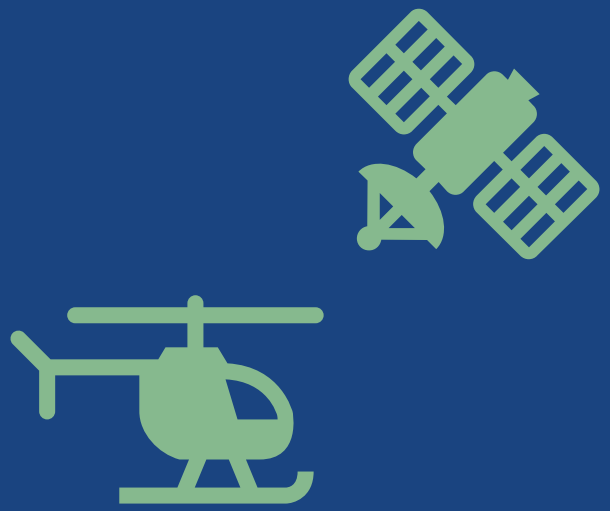


Notification of 3rd Party Identifiers

- 3rd party notifiers must submit notifications to the EPA with **15 calendar days** after detection of a super-emitter event

- **3rd party notifications must be submitted into the Super Emitter Program Portal (*https://www.epa.gov/super-emitter*) and must include:**
    - Unique 3rd party Notifier ID
    - Date of detection
    - Location of event in *latitude and longitude* coordinates
    - Owner(s) or operator(s) of an oil and natural gas facility within *50 meters* of the coordinates
    - Method used by the 3rd party to identify the owner(s) or operator(s)
    - Identification of the detection technology
    - Reference to the approval of the technology
    - Documentation (*i.e. imagery*) depicting the detected event
    - Quantified emission rate of the event in kg/hr
    - Attestation statement

The Super Emitter Program: Notification of Super-Emitter Events



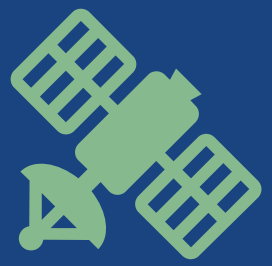
Upon receipt of notification:

- EPA will evaluate the notification for completeness and accuracy

- When the notification meets these conditions, the EPA shall:
  - Assign a unique notification identification number
  - Provide notification to the owner(s)/operator(s)
  - Post the notification (except for the owner(s)/operator(s) attribution) at *https://www.epa.gov/super-emitter*

- **The EPA then notifies the owner(s) or operator(s)**

The Super Emitter Program: Identification of Super-Emitter Events



After EPA notifies owner(s) or operator(s)

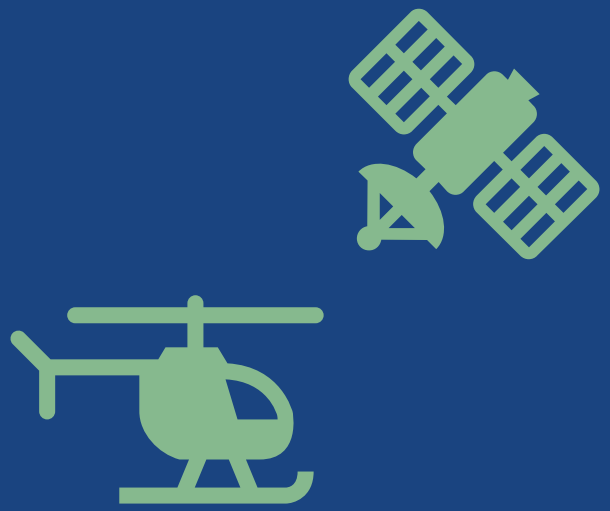
- Owner(s) or operator(s) must initiate an investigation with **5 days** and report the results to the EPA within **15 days**.

The Super Emitter Program: Identification of Super-Emitter Events

Actions to identify possible cause of Super Emitter event:

- Review any maintenance activities
- Review all monitoring data from control
- Review any fugitive emissions survey performed
- Review data from any continuous alternative technology systems
- Screen the entire well site, centralized production facility, or compressor station with OGI, EPA Method 21, or an alternative test method(s)

The Super Emitter Program: Identification of Super-Emitter Events

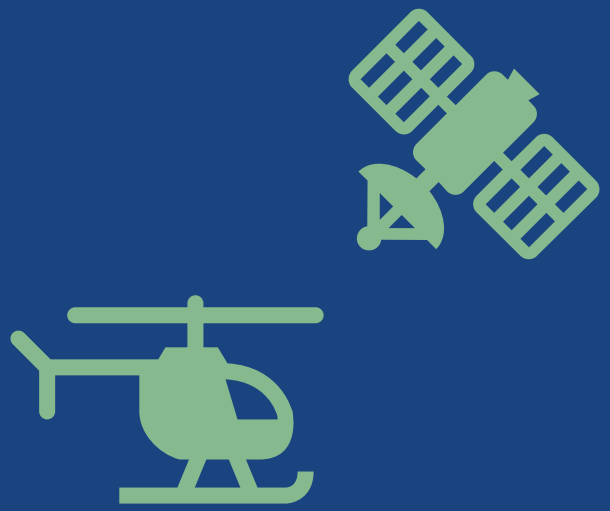


Reporting Super-Emitter Event

- The owner or operator must submit **an attestation** that the report is complete and accurate

- **The report must also include the following:**
  - Notification Report ID
  - Date and Time of *end of SE event*
  - Confirmation that you are the owner or operator of the oil and gas facility within the immediate area (i.e., 50 meters)
  - General identification for the facility
  - If the affected facilities/equipment is subject to NSPS OOOO/a/b or EG OOOOc
  - If **unable** to identify the source:
    - Confirmation that all possible investigations have been conducted
  - If **able** to identify the source:
    - ID of the source
    - If source is subject to NSPS OOOO/a/b or EG OOOOc

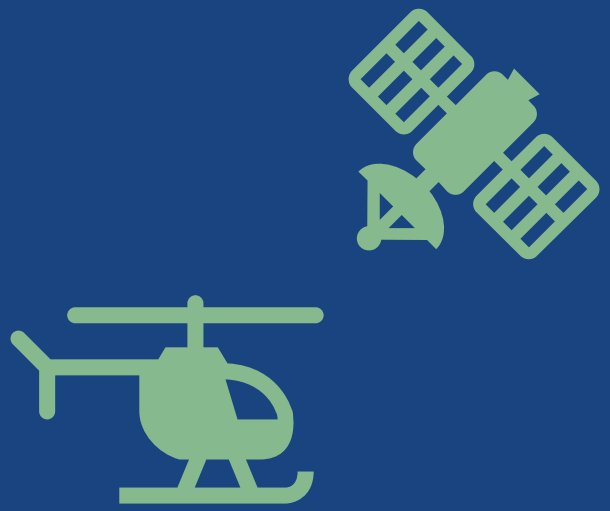
Advanced Methane Detection Technology Work Practices



- The EPA has included the use of advanced methane detection technologies in recognition of the rapid and continuous advancement of these technologies and their current use by owner(s) or operator(s) to perform Optical Gas Imaging (OGI) and AVO surveys

- These technologies are to be used as an alternative to ground-based OGI surveys, EPA Method 21, and AVO inspections to identify emissions from the collection of fugitive emissions components located at well sites, centralized production facilities, and compressor stations

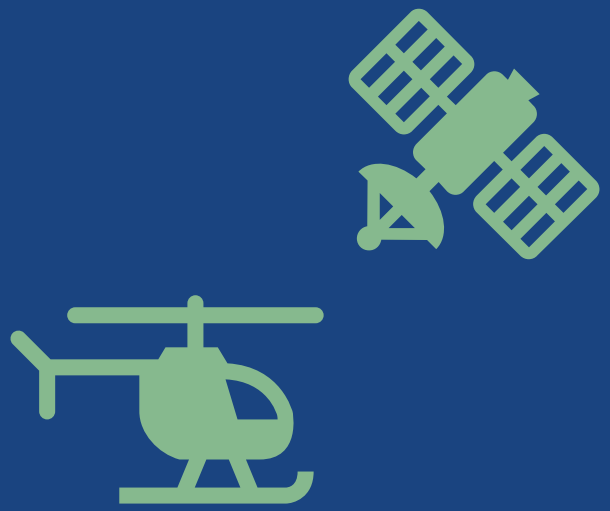
Advanced Methane Detection Technology Work Practices



Types of Technologies

- On-site sensor networks
- Aerial flyovers using remote sensing technology
- Ground-based sensors systems
- Unmanned aerial systems
- Sentinel camera systems
- Ground-based mobile monitoring

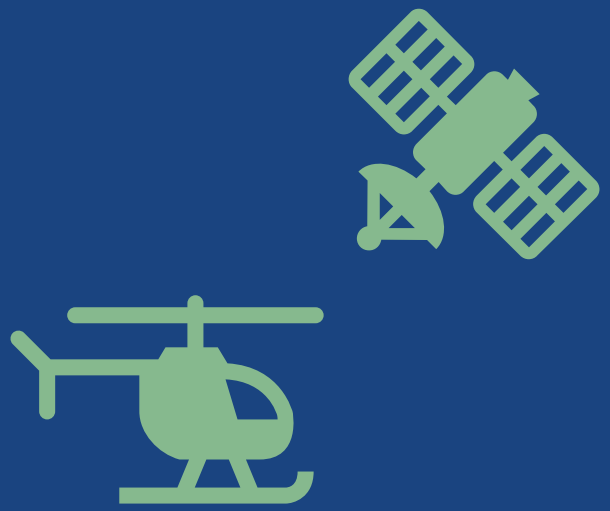
Advanced Methane Detection Technology Work Practices: Periodic Screening



Periodic Screening

- The final rules provide greater flexibility
- Frequency will be based on the technology with the highest aggregate detection threshold
- Final rule also allows owner(s) or operator(s) to replace any periodic screening survey with an OGI survey

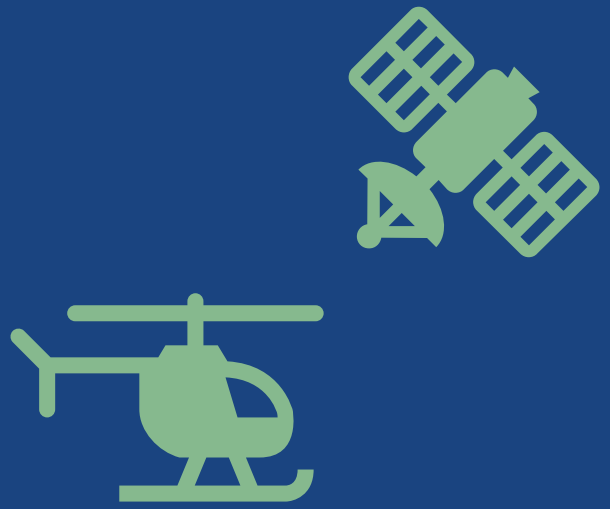
Advanced Methane Detection Technology Work Practices: Periodic Screening



Periodic Screening: Monitoring Plan

- **Owner(s) or operator(s) must develop a monitoring plan (site-specific or multiple sites)**
  - **Plan must include:**
    - Identification of each site
    - Identification and frequency of the alternative test method(s) used
    - Contact information
    - Procedures for conducting OGI surveys
    - Procedures for identifying, verifying, and repairing fugitive emissions components, covers, and closed vent systems when emission are detected

Advanced Methane Detection Technology Work Practices: Periodic Screening

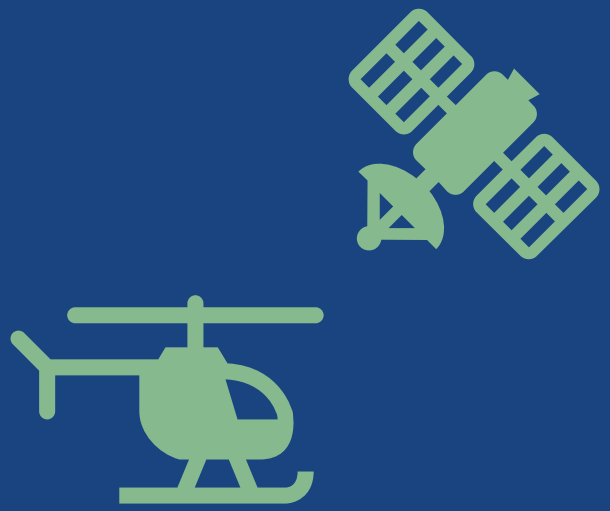


Periodic Screening: Monitoring Plan

- **Owner(s) or operator(s) must initiate periodic screenings within 90 days after:**
  - Startup or modification

- **Final rule sets timeframes**:
  - For conducting annual OGI surveys
  - For initiating periodic screenings

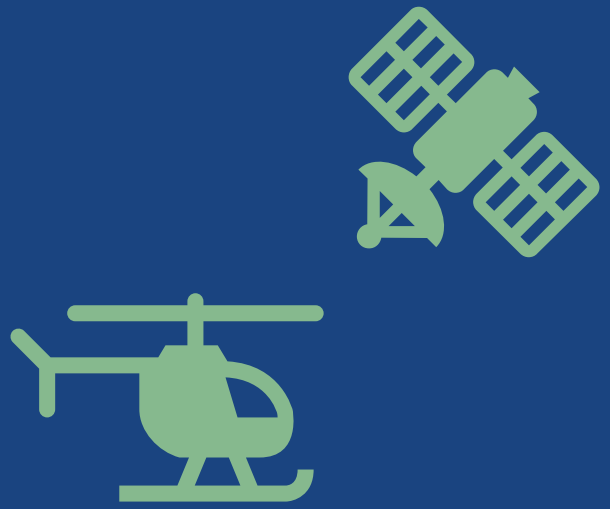
Advanced Methane Detection Technology Work Practices: Periodic Screening



Periodic Screening: Follow-up monitoring

- **Owners and operators must receive the data from a periodic screening event within 5 calendar days**
  - More targeted follow-up survey is allowed
  - Dependent on spatial resolution

Advanced Methane Detection Technology Work Practices: Periodic Screening



Periodic Screening: Follow-up monitoring

- **Owners and operators must receive the data from a periodic screening event within 5 calendar days**
  - Three different classifications for spatial resolution:

Facility Level	Area Level	Component Level
Must be able to identify emissions **within the boundary** of a well site, centralized production facility, or compressor station	Must be able to identify emission **within a radius of 2 meters** of the emission source	Must be able to identify emissions **within a radius of 0.5 meters** of the emission source

Advanced Methane Detection Technology Work Practices: Periodic Screening

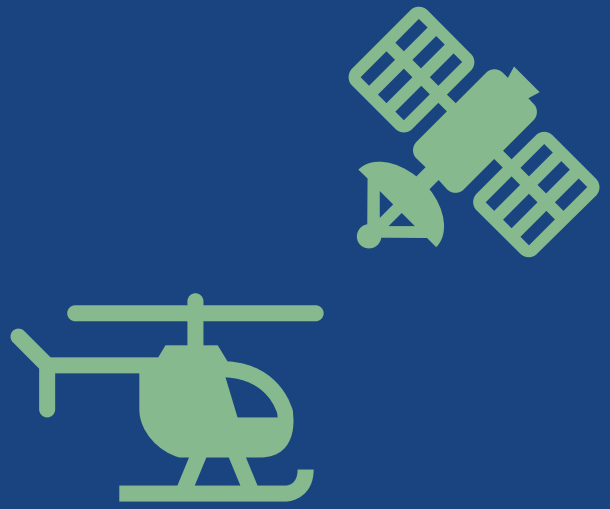
Periodic Screening: Follow-up monitoring

- **Follow-up monitoring based on spatial resolution:**

Facility Level	Area Level	Component Level
– A monitoring survey of all fugitive emissions components in an affected facility using either OGI or EPA Method 21 – Inspection of all covers and closed vent systems of the affected facility with either OGI or EPA Method 21 – Visual inspection of all closed vent systems and covers to identify if there are any defects	– A monitoring survey of all fugitive emissions components located within a 4-meter radius of the location of the confirmed detection using either OGI or EPA Method 21 – If the confirmed detection occurred in a portion of a site with a storage vessel or closed vent system, inspection of all covers and closed vent systems that are connected to all storage vessels and closed vent systems that are within a 2-meter radius of the confirmed detection location. Inspection must be conducted using either OGI or EPA Method 21*	– A monitoring survey of all fugitive emissions components located within a 1-meter radius of the location of the confirmed detection using either OGI or EPA Method 21 – If the confirmed detection occurred in a portion of a site with a storage vessel or closed vent system, inspection of all covers and closed vent systems that are connected to all storage vessels and closed vent systems that are within a 2-meter radius of the confirmed detection location. Inspection must be conducted using either OGI or EPA Method 21*

*** You must inspect the whole system that is connected to the portion of the system, not just the portion of the system that falls within the radius of the detected event**

Advanced Methane Detection Technology Work Practices: Periodic Screening



Periodic Screening: Confirmed Detection

- **These requirements include:**
  - Repair all fugitive emissions components, covers, and closed vent systems within **30 days**
  - Initiate an investigative analysis within **5 days** (closed vent or cover)
  - Initiate an investigative analysis within **24 hours** (failed control device)
  - Investigative analyses must be used to determine the underlying primary cause and other contributing causes to the emissions event.

  - Owners and operators must determine the actions needed to:
    - Bring the control device into compliance
    - How to prevent future failures

  - Updates are necessary to the engineering analysis for the cover or closed vent system to prevent future emissions from the cover and closed vent system

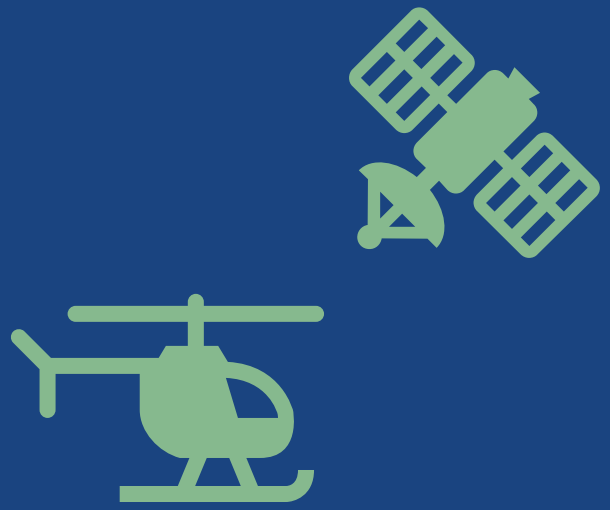
Advanced Methane Detection Technology Work Practices: Continuous *monitoring screening*

Continuous Monitoring Screening

- **EPA is finalizing the continuing monitoring approach and associated work practice**
  - Changes include:
    - Better accountability for background methane concentrations
    - Better incorporation of additional types of measurement systems

- **The EPA has reexamined the proposed detection threshold for these systems and has adjusted that threshold in the final rule to better account for background methane concentrations.**

Advanced Methane Detection Technology Work Practices: Continuous *monitoring screening*



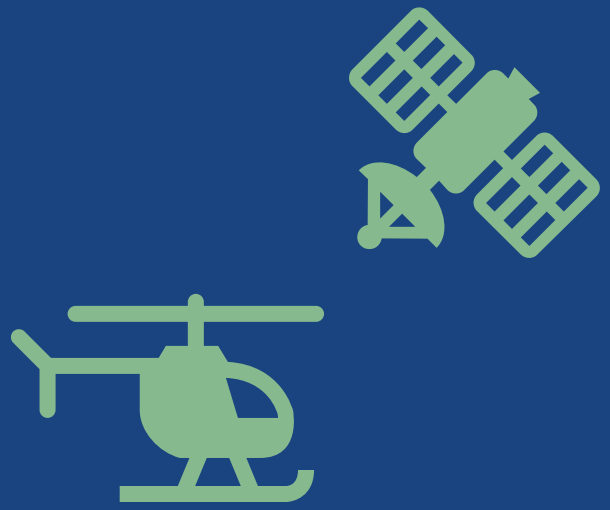
Continuous Monitoring Screening

- **The final rule includes defined requirements for operating continuous monitoring systems.**

- **This system must be set-up in a manner:**
  - To generate a valid methane mass emission rate (or equivalent) once at least every twelve-hour block
  - Have an operation downtime of less than 10 percent
  - Have checks in place to monitor the health of the system.

- **We have revised the proposed sensitivity requirements**:
  - Allows systems with detection thresholds of **0.40 kg/hr** of methane or lower
  - Systems to transmit data at least once every **24 hours**

Advanced Methane Detection Technology Work Practices: Continuous *monitoring screening*



Continuous Monitoring Screening

- **The final rule maintains:**
  - The timeline for when the owner or operator must initiate continuous monitoring using advanced methane detection technology
    - Within 120 days
  - The timeframe for initiating continuous monitoring if an owner or operator opts to switch to periodic screenings at a later time

Advanced Methane Detection Technology Work Practices: Continuous *monitoring screening*

Continuous Monitoring Screening: Action Levels

- **What are Action Levels?**
  - The time weighted average that triggers an investigative analysis to identify the cause(s) of the exceedance

Affected Facilities	Action Levels
Wellhead only well sites	- Rolling **90-day average** of **1.2kg/hr** of methane* - Rolling **7-day average** of **15kg/hr** of methane*
Well sites with major production and processing equipment, small well sites, centralized production facilities, and compressor stations	- Rolling **90-day average** of **1.6kg/hr** of methane* - Rolling **7-day average** of **21kg/hr** of methane*

*** Over the site-specific baseline**

Advanced Methane Detection Technology Work Practices: Continuous *monitoring screening*

Action Levels: Site-Specific Baselines

- The final rule includes new and defined set of criteria for the timeframe and site conditions under which to establish the site-specific baseline emissions

- **Establishing the site-specific baseline:**
  - Prior: Owner or operator must perform inspections of fugitive emissions to ensure the site is leak free
  - Owner or operator must then record site-level emissions from the continuous monitoring system for **30 days**

Advanced Methane Detection Technology Work Practices: Continuous *monitoring screening*

Action Levels: Calculating rolling averages

- The final rule also maintained the intent of required follow-up activities when exceedances of the action-level have occurred

- **The requirements of an investigative analysis are as follows:**
  - Must be inititated within **5 days**

  - When the **7-day** action-level is exceeded:
    - Investigative analysis must be completed within **5 days** after the exceedance

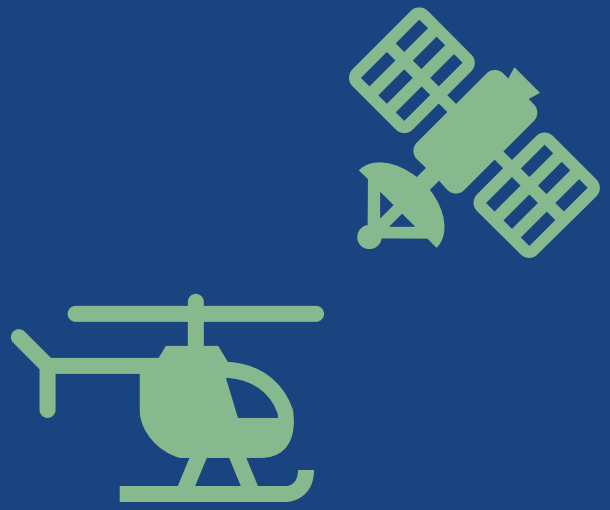
  - When the **90-day** action level is exceeded:
    - Investigative analysis must be completed within **30 days** after the exceedance

Advanced Methane Detection Technology Work Practices: Continuous *monitoring screening*

Action Levels: Developing mass emission rate reduction plan

- **An owner or operator must develop a mass emission rate reduction plan when any of the following conditions have been met:**
  - For an exceedance of the **90-day** action-level:
    - **30-day** average mass emission rate for the **30 days** following the completion of the investigative analysis
  - For an exceedance of the **7-day** action-level:
    - Mass emission rate for the **24-hour** period after the completion of the investigative analysis
  - The actions needed to reduce the emission rate below the applicable action-level will take more than **30 days** to implement

Advanced Methane Detection Technology Work Practices: Alternative Test Method for Methane Detection Technology

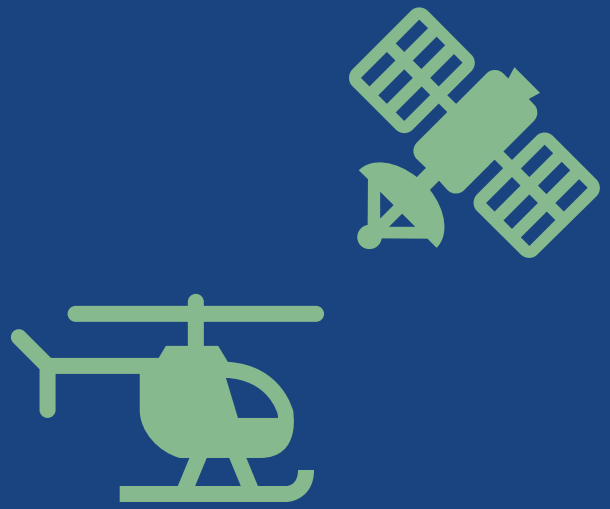


Alternative Test Method for Methane Detection Technology

- Using a new alternative test method provision, specific criteria for the review, evaluation, and potential use of advanced methane detection technology for use in periodic screening, continuous monitoring, and/or super-emitter detection can be used

- **To submit a request for an alternative test method for methane detection technology:**
  - Must be submitted to Leader, Measurement Technology Group
    - With any supporting data to the methane detection portal (*www.epa.gov/emc/oil-and-gas-alternative-test-methods*)
  - The Administrator will complete an initial completeness review of submissions within **90 days**
  - An approval/disapproval will be issued in writing within **270 days** after receiving a request

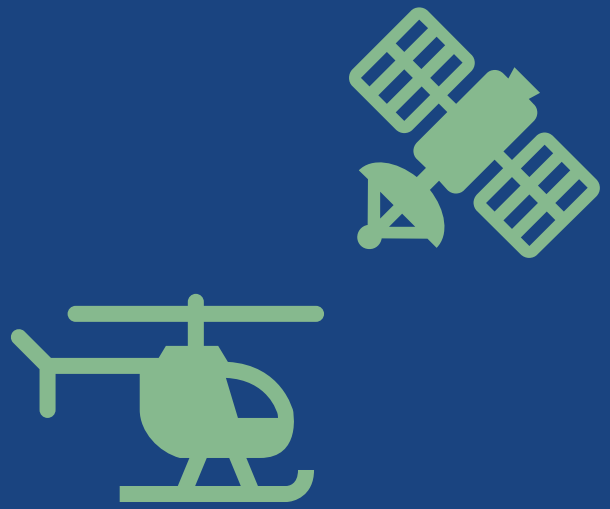
Advanced Methane Detection Technology Work Practices: Alternative Test Method for Methane Detection Technology



Alternative Test Method for Methane Detection Technology

- **Who can submit an alternative test method request?**
  - The entity must
    - Be an individual/organization located in or that has representation in the United States
    - Be an owner or operator of an affected facility under NSPS OOOOb or EG OOOOc
  - If the entity is not the owner or operator of an affected facility:
    - The entity must directly represent the provider of the candidate measurement system using advanced methane detection technology
    - The measurement system must have been applied to measurements and monitoring in the oil and gas sector (domestically or internationally)
  - The candidate measurement system must have been sold, leased, or licensed, or offered for sale, lease, or license to the general public or developed by an owner or operator for internal use and/or use by external partners

Advanced Methane Detection Technology Work Practices: Alternative Test Method for Methane Detection Technology



Alternative Test Method for Methane Detection Technology

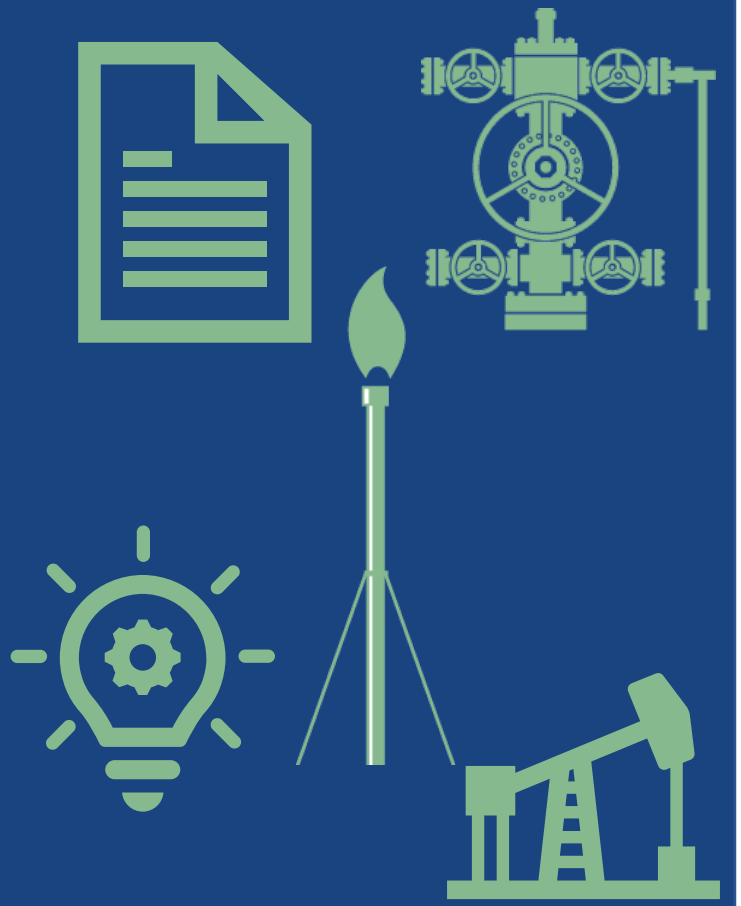
- **What information is required in the request?**
  - The entity must provide the Administrator:
    - Contact information for the requester
    - The desired applicability of the technology
    - A description of the candidate measurement technology system, including:
      - A description of the scientific theory
      - A description of the physical instrument
      - Type of measurement and desired application
      - Potential limitations of the candidate measurement system, including application limitations

Advanced Methane Detection Technology Work Practices: Alternative Test Method for Methane Detection Technology

Alternative Test Method for Methane Detection Technology

- **What information is required in the request? (Cont.)**
  - The request must also include information on how the system converts results to a mass emission rate or equivalent and include the following:
    - Workflow and description covering all steps and processes
    - Description of how any meteorological data are used
    - Identification of any model(s) used
    - All calculations used
    - A-priori methods and datasets used
    - Explanation of any algorithms/machine learning procedures used in the data processing, if applicable
  - The request must also include:
    - A description of how data is collected, generated, maintained, and stored
    - How these data streams are processed and manipulated
    - A description of which data streams are provided to the end-user of the data

The Final Rule:



Includes Requirements for State Plans for Existing Sources

- Includes Emissions Guidelines for states to follow as they develop plans that establish, implement, and enforce performance standards for methane emissions from existing sources. EPA refers to existing sources as “designated facilities.”

State Plans for Reducing Methane from Existing Sources

Key Dates:

- 24 months State Plan
- 36 months compliance

Federally recognized Tribes have the opportunity, but not the obligation, to develop their own plans

State Planning Process, cont.

Clarifies existing program for States/Tribes

Subpart Ba Implementing Regulations:

- Meaningful engagement
- Applying a less-stringent standard to a source

The final rule will yield significant climate and health benefits

The final rule will achieve:

- Historic reductions in methane pollution
- Reductions in smog-forming VOCs
- Reductions in air toxics like benzene.

Net climate and ozone health benefits from 2024 – 2038 ($2019)

- $97 to $98 billion dollars
  - Equivalent of $7.3 to $7.6 billion a year
  - After accounting for the costs of compliance and savings from recovered natural gas.

Emission Reductions

From 2024-2038 the rule will avoid:

Pollutant	Emissions Reductions (2024-2038 Total)
Methane (million short tons)[a]	58
VOC (million short tons)	16
Hazardous Air Pollutants (million short tons)	0.59
Methane (million metric tons CO_2 equivalent)[b]	1,500

[a] To convert from short tons to metric tons, multiply the short tons by 0.907. Alternatively, to convert metric tons to short tons, multiply metric tons by 1.102.

[b] Carbon dioxide equivalent (CO2 Eq). calculated using a global warming potential of 28.

Addressing NACAA's Concerns from Comments

NACAA Concerns	How Concerns Were Addressed
Wanted a model State Plan	The Emissions Guidelines include "presumptive standards", which act as a model for State Plans (see §60.5376c)
Concerned about costs surrounding implementation	The new standards will work hand-in-hand with new resources and programs in the Inflation Reduction Act.
Concerned about the learning curve of alternative technology methods (including supply chain issues)	EPA is giving new sources a year from the effective date to fully comply to account for supply chain issues that industry raised in comments.
Concerned about smallest well sites	We finalized AVO quality monitoring for fugitive emissions for these well sites.
Concerned about authority of the Super Emitter Program (including misinformation)	The EPA will provide a strong oversight role and ensure the program operates with a high degree of integrity, transparency, and accountability

More information is available on EPA's website

Website for the final rule:

https://www.epa.gov/controlling-air-pollution-oil-and-natural-gas-operations/epas-final-rule-oil-and-natural-gas