

December 6, 2022

SUMMARY OF EPA'S SUPPLEMENTAL PROPOSAL FOR NEW SOURCE PERFORMANCE STANDARDS AND EXISTING SOURCE EMISSIONS GUIDELINES FOR OIL AND NATURAL GAS

On December 6, 2022, the Environmental Protection Agency (EPA) published its “Standards of Performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review” supplemental proposal.¹ Under the Clean Air Act (CAA) Section 111(b), EPA is required to set New Source Performance Standards (NSPS) to reduce methane and volatile organic compounds (VOCs) from the oil and natural gas sector. Under CAA 111(d), EPA will set nationwide Emission Guidelines (EG), based on the best system of emission reduction (BSER), for states to use in state plans that will limit methane emissions from existing sources from the oil and natural gas sector.

The supplemental proposal provides additions, amendments, and clarification to EPA’s November 2021 oil and gas NSPS and EG proposal. The supplemental proposal includes strengthened emissions standards for oil and gas equipment and adds requirements for sources not previously covered, such as abandoned and unplugged wells and lower-producing wells. The supplemental proposal also includes a process that will allow operators to use advanced technologies to meet the rule’s leak detection requirements. The 2021 proposal and supplemental proposal establish the first nation-wide methane regulations for existing oil and gas sources. For nearly all regulated source categories, EPA proposes identical NSPS and EG (i.e., the same level of stringency for new and existing sources).

This summary highlights key takeaways and reviews the main components of EPA’s proposed actions. Additional information and supporting materials are available on EPA’s [website](#). EPA will hold a virtual public hearing on the supplemental proposal January 10 and 11, 2023, and will accept comments until February 13, 2023. EPA intends to issue its final rule covering both the supplemental proposal and 2021 proposal in 2023.

KEY TAKEAWAYS

- EPA proposes revised standards from the November 2021 proposal, additional standards, and regulatory text. Key elements of the supplemental proposal include:
 - Revised leak detection and repair requirements for new and existing well sites with monitoring frequency based on the types and amount of equipment present at a site. EPA proposes to require leak monitoring until a well is plugged and closed, with no exemptions for smaller sites or low-producing wells;

¹ The Environmental Protection Agency, “Standards of Performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review” Supplemental Notice of Proposed Rulemaking, December 6, 2022, <https://www.govinfo.gov/content/pkg/FR-2022-12-06/pdf/2022-24675.pdf>.

- An approval process to allow advanced methane detection technologies to be used to meet leak monitoring requirements. EPA proposes monitoring requirements for both periodic and continuous monitoring using advanced technologies;
 - A Super-Emitter Response Program which would require operators to respond to high-volume methane leaks reported by EPA-approved third parties;
 - Zero-emission standards for pneumatic pumps;
 - The first federal requirements for centrifugal compressors with dry seals; and
 - Requirements to ensure flares are operating properly and achieving a specific emissions destruction efficiency.
- EPA's supplemental proposal provides guidance to states and Tribal nations (that choose to develop plans) on how to develop state plans to reduce methane emissions from existing sources, including guidance on alternative approaches that would be equivalent to the proposed EG.
 - EPA estimates that the supplemental proposal would create \$3.1 billion to \$3.2 billion in climate benefits annually, with total net benefits estimated to be \$34 billion to \$36 billion from 2023 to 2035. Additionally, it is estimated that in 2030, methane emissions from covered sources will be 87 percent lower than 2005 levels.

BACKGROUND

In 2012 and 2016, EPA promulgated rules that established NSPS for sources in the oil and natural gas sector. In the 2012 rule, "Oil and Natural Gas Sector: New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants Reviews; Final Rule," EPA established the NSPS for VOC emissions from sources in the oil and natural gas source category at 40 Code of Federal Regulations (CFR) part 60, subpart OOOO. In the 2016 rule, "Oil and Natural Gas Sector: Emissions Standards for New, Reconstructed, and Modified Sources; Final Rule," EPA established additional NSPS for VOC and added NSPS for methane emissions at 40 CFR part 60, subpart OOOOa (NSPS OOOOa).

In October 2018 under the Trump administration, EPA proposed technical amendments (Technical Rule) to aspects of NSPS OOOOa. EPA proposed changes to the fugitive emissions requirements, technology and state equivalency provisions, and definitions and language that affect operational and reporting requirements. EPA indicated in materials accompanying the proposed Technical Rule that it was continuing to consider broad policy issues, including reconsidering the regulation of GHG emissions in the oil and natural gas sector. This review resulted in EPA's 2019 proposal (Policy Rule) to remove methane requirements for the oil and natural gas source category and remove the transmission and storage segment from the source category. In August 2020, EPA finalized both the Technical Rule and Policy Rule.

In June 2021, President Biden signed into law a joint resolution of Congress, adopted under the Congressional Review Act (CRA), disapproving the final Policy Rule. The CRA resolution reinstated standards for the transmission and storage segment, as well as the methane standards for the production, gathering and boosting, and processing segments. The CRA resolution did not address the Technical Rule.

In November 2021, EPA proposed a series of actions under the CAA to update and extend emissions requirements for sources in the oil and natural gas sector. The actions included (1) the reconciliation of methane and VOC requirements consistent with the joint resolution of Congress under the CRA disapproving of EPA's final 2020 Policy Rule; (2) proposed revisions to the NSPS for GHGs and VOCs to reflect EPA's most recent assessment of the feasibility and cost of reducing emissions from sources in the oil and natural gas sector; and (3) proposed EG for states to establish emission performance limits for existing sources in the oil and natural gas sector. Consistent with previous regulations of the oil and natural gas sector, the 2021 proposed actions include sources in the production, processing, and transmission and storage segments but not the distribution segment. Note that in the proposed regulation, sources in the gathering and boosting segment are captured within EPA's definition of the production segment. The 2022 supplemental proposal expanded the 2021 proposal to increase emission reductions and provide additional details for compliance.

SUMMARY OF PROPOSED REQUIREMENTS

EPA proposes changes to the emissions standards for new sources and proposes EG for states to address GHG emissions from existing sources through the development of state plans. The proposed EG includes presumptive standards for states. EPA's actions to establish emissions standards for new sources of GHGs and VOCs are required under CAA section 111(b). Under the CAA section 111(d), once EPA regulates GHG emissions for new sources, EPA must issue EG that identifies the degree of emission limitation achievable through application of the best system of emissions reduction (BSER). VOCs are regulated separately as precursors to ozone under CAA section 110 and the Act does not require EPA to issue EG for VOCs. Strategies to reduce methane emissions from oil and gas equipment also reduce VOCs. EPA's proposed methane EG for existing sources will therefore also reduce VOCs from existing sources.

In addition to the requirements summarized below, EPA proposes changes to the leak monitoring requirements at gas processing plants, sulfur dioxide (SO₂) standards for gas sweetening units, and requirements related to record keeping and the emissions measurement methodologies used to demonstrate compliance. EPA solicits feedback on a number of specific elements of the supplemental proposal, which are outlined in an EPA [memo](#).

Fugitive Emissions from Well Sites and Compressor Stations

The supplemental proposal includes updated fugitive emission monitoring requirements for well sites and compressor stations. The proposed monitoring requirements for new and modified sources under NSPS are the same as the proposed EG for existing sources. The proposal maintains optical gas imaging (OGI) as the primary monitoring technology, with Method 21 as an alternative option. As described later in this document, the supplemental proposal also includes a framework to allow other technologies to be used for leak surveys.

The supplemental proposal includes several changes from the 2021 proposal related to leak detection and repair (LDAR) requirements. The 2021 proposal set leak survey frequencies for well sites based on estimated emissions from a given site and exempted sites with low emissions (< 3 tons per year (tpy) methane), as well as sites with wellheads only, from annual monitoring requirements. The supplemental proposal sets new survey frequency requirements based on the type and amount of equipment on a given site. This would require monitoring at all well sites and

remove the exemption for sites with estimated methane emissions of < 3 tpy and for wellhead only sites. The supplemental proposal also adds audio, visual, and olfactory (AVO) inspection requirements at sites with OGI inspection requirements. For example, while EPA maintains the existing quarterly LDAR with OGI requirement for compressor stations, it proposes to require monthly AVO inspections at these sites.

A key element of the supplemental proposal are requirements for abandoned and unplugged wells. EPA proposes to require monitoring at all well sites until they are plugged, and for operators to conduct a final OGI survey after plugging to ensure there are no emissions. Monitoring would no longer be required after completion of this process.

The supplemental proposal also changes the definition of “fugitive emissions component” to revise the types of equipment that would be considered affected sources and subject to LDAR requirements. Specifically, natural gas-driven pneumatic controllers and pneumatic pumps as well as certain storage tanks are not considered fugitive emissions components because they are regulated under other rules and including them in LDAR programs would be redundant. EPA proposes to not define control devices (e.g., flares) as fugitive emissions components, as was proposed in 2021. EPA notes that control devices will have methane and VOC emissions even when operating properly, and EPA also proposes requirements to ensure control devices are operating properly. Finally, EPA proposes to add facility yard piping as a fugitive emissions component that would be subject to LDAR.

Table 1. Proposed Fugitive Emission Monitoring Requirements for New and Existing Sites

Type of Site	Summary of Proposed NSPS and EG
Single wellhead-only sites and small well sites*	Quarterly AVO; repair for indications of potential leaks within 15 days
Wellhead-only sites with two or more wellheads	Quarterly AVO, repair for indications of potential leaks within 15 days <i>and</i> Semi-annual OGI (or Method 21) monitoring; first repair attempt within 30 days, final repair within 30 days of first attempt
Sites with major production and processing equipment and centralized production facilities	Bi-monthly (every other) AVO; repair for indications of potential leaks within 15 days <i>and</i> Quarterly OGI (or Method 21) monitoring; first repair attempt within 30 days, final repair within 30 days of first attempt
Compressor stations	Monthly AVO <i>and</i> Quarterly OGI (or Method 21) monitoring; first repair attempt within 30 days, final repair within 30 days of first attempt
Well sites and compressor stations on Alaska North Slope	Annual OGI (or Method 21) monitoring; first repair attempt within 30 days, final repair within 30 days of first attempt

*small well sites are defined a single wellhead well sites with no controlled storage tanks, control devices, pneumatic controller affected facilities or pneumatic pump affected facilities and only one other piece of major production and processing equipment.

Alternative Leak Monitoring Technologies

The supplemental proposal includes options that would allow operators to use alternative periodic or continuous screening technologies for fugitive emissions monitoring. The proposed approach would allow these technologies to be used in place of OGI or Method 21. EPA has proposed a matrix-based approach for both periodic and continuous monitoring that aims to provide equivalent performance as the proposed leak monitoring requirements that use OGI or Method 21. EPA proposes the same requirements for both new and existing sources, and the alternative monitoring approaches would be applicable to both the LDAR requirements for well pads and compressor stations as well as the separate monitoring requirements for covers and closed vent systems.

The alternative LDAR approach in the supplemental proposal is significantly different from the alternative approach in the 2021 proposal. The 2021 proposal's alternative approach required bimonthly (i.e., every other month) screening using a technology with a minimum detection limit of 10 kg methane per hour and annual OGI screening; it did not propose an approach for continuous monitoring technologies.

For alternative periodic screening approaches, EPA proposes screening frequencies based on the minimum detection threshold of the technology. EPA proposes different requirements for sites that would be subject to quarterly OGI (well sites with major production equipment, centralized production facilities, and compressor stations) and those subject to less stringent monitoring (single- and multi-wellhead only sites and small well sites) under the proposed conventional LDAR requirements.

EPA proposes to require operators to conduct a ground-based survey using OGI to identify any leaks detected by periodic alternative screening technologies. The proposal would require any identified leaks on fugitive emissions components to be repaired within 30 days. Leaks on control devices would require a root-cause analysis within 24 hours and be repaired as soon as possible. The initial monitoring by alternative periodic technologies would need to occur within 90 days of facility startup or modification, or no later than the next scheduled OGI survey for facilities that were previously complying with OGI-based monitoring requirements.

Table 2. Proposed Survey Matrix for Alternative Periodic Screening Approach for Affected Facilities Subject to Quarterly OGI Monitoring Methane

Minimum Screening Frequency	Minimum Detection Threshold of Screening Technology
Quarterly and Annual OGI	≤ 1 kilogram per hour (kg/hr)
Bimonthly	≤ 2 kg/hr
Monthly	≤ 4 kg/hr
Bimonthly and Annual OGI	≤ 10 kg/hr
Monthly and Annual OGI	≤ 30 kg/hr

Table 3. Proposed Survey Matrix for Alternative Periodic Screening Approach for Single and Multi-Wellhead-Only Sites and Small Well Sites

Minimum Screening Frequency	Minimum Detection Threshold of Screening Technology
Semi-annual	≤ 1 kg/hr
Triannual	≤ 2 kg/hr
Triannual and Annual OGI	≤ 5 kg/hr
Quarterly and Annual OGI	≤ 15 kg/hr
Monthly and Annual OGI	≤ 30 kg/hr

For alternative continuous monitoring approaches, EPA proposes a matrix based on quantified methane emissions leak rates over short and long timescales. The proposal would require an operator to take action if a rolling average methane emission rate reaches a specific level for each timeframe. The short- and long-term leak rate thresholds differ based on the type and amount of equipment at a site. As proposed, EPA would not allow technologies that are not able to quantify emissions to serve as alternative continuous monitoring technologies but seeks comment on how such technologies could fit within a continuous monitoring approach.

EPA proposes to require operators to initiate a root cause analysis within five days of any detected exceedance of the short- or long-term leak rate thresholds. Corrective action would be required within five days for any short-term exceedance and within 30 days for any long-term exceedance. EPA proposes to require operation of continuous monitoring systems within 120 days of facility startup or modification, or no later than the next scheduled OGI survey for facilities that were previously complying with OGI-based monitoring requirements.

Table 4. Proposed Alternative Continuous Monitoring Approach for New and Modified Well Sites

Type of Site	Type of Action Level	Proposed Monitoring Requirements
Wellhead-only sites	Long-term	1.2 kilograms per hour (kg/hr), rolling 90-day average calculated each day
Wellhead-only sites	Short-term	15 kg/hr, rolling seven-day average calculated each day
Other well sites and compressor stations	Long-term	1.6 kg/hr, rolling 90-day average calculated each day
Other well sites and compressor stations	Short-term	21 kg/hr rolling seven-day average calculated each day

EPA proposes a process for approving alternative periodic and continuous monitoring technologies. Technologies would be assessed by EPA using the existing alternative test method framework set forth in 40 CFR 60.8(b)(3). Once approved by EPA, technologies could be used by operators in place of OGI; operators would not need to request approval for deploying the technology at each individual site or facility. EPA proposes to issue an approval or disapproval of alternative approaches within 270 days of receipt of the request. EPA would allow conditional

approval if a determination were not made within 270 days, and EPA would retain the right to rescind any previous approval. The existing framework for alternative monitoring approaches requires EPA approval of alternative approaches through site-specific monitoring plans.

The supplemental proposal includes a list of pre-qualifications that alternative monitoring methods must meet to request approval:

- Requestors are limited to any individual or organization located in or that has representation in the U.S.;
- Requestor must have direct knowledge of the design, operation, and characteristics of the underlying technology;
- The underlying technology must have been applied to methane measurements in the oil and gas production, processing, and/or transmission and storage sectors either domestically or internationally; and
- The technology must be a commercial product, meaning it has been sold, leased, or licensed, or offered for sale, lease, or license, to the general public.

EPA proposes that any application for an alternative test method must contain the following information:

- The desired applicability of the technology (i.e., site-specific, basin-specific, or broadly applicable across the sector);
- A description of the measurement systems;
- Supporting information verifying that the technology meets the desired detection threshold(s) as applied in the field;
- A detailed description of the alternative testing procedure(s), including data quality objectives to ensure the detection threshold(s) are maintained and procedures for a daily verification check of the measurement sensitivity under field conditions; and
- Standard operating procedures are consistent with EPA's guidance and include safety considerations, measurement limitations, personnel qualification/responsibilities, equipment and supplies, data and record management, and quality assurance/quality control.

Super Emitter Response Program

In the supplemental proposal, EPA notes that studies show methane emissions from a small number of sources make up over half of the methane emissions within the sector. These "super-emitter" events, which EPA proposes to define as events with methane emissions of 100 kg/hr or greater, are often due to abnormal operating conditions or malfunctions. EPA proposes to establish a Super-Emitter Response Program, which would allow EPA-approved entities to report large emissions events to facility operators and EPA. Operators would be required to conduct a root-cause analysis and take corrective action, if necessary.

EPA proposes to allow the use of remote-sensing aircraft, mobile monitoring platforms, or satellites as eligible technologies to identify super-emitter emissions events, although EPA is requesting comment on the list of technologies that can be used to identify super-emitter events. To ensure quality and reliable data, EPA proposes that third-party notifiers must be pre-approved

by EPA for the notification to be valid. Examples of potential notifiers include technology vendors, industry, researchers, non-profit organizations, or other parties that demonstrate technical expertise with detection technology. EPA proposes a process that would allow operators to rebut any super-emitter event notification by third parties, as well as a mechanism for revoking a notifiers approval status if more than one notification contains demonstrable errors.

Once operators have been notified of a super-emitter event, they would be required to conduct a root cause analysis to identify the cause of the super-emitter event within five days. Operators would have ten days within receiving a notification to complete corrective actions. If corrective action will take longer than ten days, or if a repeat event occurs at the same source, operators would be required to submit a corrective action plan to EPA within 30 days of the initial event notification. Lastly, operators would be required to submit a written report to EPA within 15 days of completion of the root cause analysis and corrective action. EPA would make these reports publicly available.

Pneumatic Controllers

EPA proposes to maintain the overall requirement that new and existing pneumatic controllers have zero methane and VOC emissions. The supplemental proposal revises the definition of a pneumatic controller affected facility to be the collection of all natural gas-driven pneumatic controllers at a site. EPA's 2021 proposal defined each individual controller as an affected facility. EPA also proposes to include natural gas-driven pneumatic controllers that capture and send vent gas to sales or to a process, as well as controllers that are self-contained, as affected facilities. The 2021 proposal excluded these types of devices from the affected facility definition. EPA notes that while these types of controllers have zero emissions when operating properly and can therefore be used to meet the proposed requirements, it is appropriate to include them in the definition of affected facility because emissions can still occur if the devices do not operate correctly. EPA proposes to maintain its exemption for pneumatic controllers at sites in Alaska without electricity, which may use intermittent-bleed controllers instead of zero-emissions controllers. The zero-emissions requirement also would not apply to pneumatic controllers that serve as emergency shutdown devices.

Table 5. Proposed Requirements for New and Existing Pneumatic Controllers

Source	NSPS and EG
Natural gas-driven pneumatic controllers	NSPS: methane and VOC emission rate of zero EG: methane emission rate of zero
Natural gas-driven pneumatic controllers in Alaska at sites without access to electricity	NSPS and EG: natural gas bleed rate \leq 6 scf/hour (i.e., use of low-bleed devices) for continuous bleed devices; OGI monitoring at frequency of site LDAR requirement for intermittent bleed devices

Pneumatic Pumps

The supplemental proposal requires new and existing pneumatic pumps across all regulated segments (production, processing, transmission and storage) to achieve a zero-emissions standard. This is a significant change from the 2021 proposal, which required all pneumatic pumps at processing plants to operate with zero emissions and pumps in the production (diaphragm and

piston pumps) and transmission and storage (diaphragm pumps only) segments to achieve a 95 percent reduction in methane and VOC emissions by routing to an existing control process (i.e., installation of a control process was not required if one did not already exist). EPA specifically proposes that the zero-emissions standard is met by using pneumatic pumps not driven by natural gas. Natural gas-driven pumps would be prohibited at sites with access to electricity.

EPA proposes a tiered performance standard approach for sites without electricity where it may be technically infeasible to use a non-natural gas driven pump. These sites would be required to capture pneumatic pump emissions and route them to a process. If a site has four or more pneumatic pumps and it is demonstrated that it is technically infeasible to route emissions to a process, emissions must be captured and routed to a control device that provides at least 95 percent reduction in emissions. At sites with less than four diaphragm pumps where it is technically infeasible to route to a process, emissions must be routed to an existing control device that achieves a 95 percent reduction in emissions (i.e., a control device would not be required to be installed if not already in place).

EPA's supplemental proposal also updates the definition of a pneumatic pump affected facility. Similar to pneumatic controllers, the proposal would shift the definition of an affected facility from each individual pneumatic pump to the collection of all pneumatic pumps at a site.

Table 6. Proposed Requirements for New and Existing Pneumatic Pumps

Source	NSPS and EG
Pneumatic pumps	NSPS: methane and VOC emission rate of zero EG: methane emission rate of zero

Centrifugal Compressors

EPA proposes to require new and existing centrifugal compressors with dry seals to achieve and maintain an emissions rate at or below 3 standard cubic feet (scf)/minute. This is the first time EPA has proposed methane and VOC emissions standards for dry seal centrifugal compressors. Because requirements for dry seal centrifugal compressors were not included in the 2021 proposal, the new/existing source cutoff date for these sources will be December 6, 2022, the supplemental proposal's date of publication in the Federal Register.

For centrifugal compressors with wet seals, EPA proposes to maintain the requirement from the 2021 proposal that new sources achieve a 95 percent reduction in methane and VOC emissions. EPA proposes a separate NSPS for self-contained wet seal centrifugal compressors, which would be required to achieve and maintain an emissions rate of 3 scf/minute or less. For all existing wet seal centrifugal compressors, the supplemental proposal would require compressors to achieve and maintain an emissions rate of 3 scf/minute or less. EPA proposes a compliance alternative of reducing methane and VOC emissions by at least 95 percent. The 2021 proposal would have established a 95 percent emissions reduction requirement for both new and existing sources.

All sources subject to the 3 scf/minute emissions limit would be required to conduct volumetric emissions measurements to verify leak rates on or before 8,760 hours of operation or previous measurement. The requirements for wet and dry seal centrifugal compressors would apply to

individual compressors at compressor stations and centralized production facilities; production-segment compressors at standalone well sites would not be subject to the emissions limit.

Table 7. Proposed Requirements for New and Existing Centrifugal Compressors

Source	NSPS and EG
Wet seal centrifugal compressors (except those at standalone well sites)	NSPS: 95 percent reduction in methane and VOC emissions EG: volumetric flow rate \leq 3 scf/minute; alternative compliance option of 95 percent reduction in methane emissions
Self-contained wet seal centrifugal compressors (except those at standalone well sites)	NSPS and EG: volumetric flow rate \leq 3 scf/minute
Dry seal centrifugal compressors (except those at standalone well sites)	NSPS and EG: volumetric flow rate \leq 3 scf/minute

Reciprocating Compressors

For reciprocating compressors, the supplemental proposal makes slight changes to the 2021 proposed requirements for new and existing sources. EPA proposes to set a numerical emissions limit of 2 scf/minute for reciprocating compressors. This is a different approach than proposed in 2021, which was a work practice standard that would have required operators to replace compressor rod packing after discovering an exceedance of 2 scf/minute. The updated proposal requires operators to maintain a leak rate below the numerical performance standard (i.e., the standard is an emissions rate, not a work practice).

The 2021 proposal also required replacement of compressor rod packing if emissions above 2 scf/minute were detected. The supplemental proposal clarifies that rod packing may be replaced or repaired to maintain operations below the emissions standard. The supplemental proposal also clarifies that monitoring to ensure compliance with the standard is based on 8,760 hours of operation rather than on the calendar year. Finally, as in the 2021 proposal, the supplemental proposal includes an alternative compliance option of capturing and routing rod packing gas to a process. EPA proposes to not require the gas capture system operate under negative pressure, as was proposed in 2021.

The requirements for reciprocating compressors would apply to individual compressors at compressor stations and centralized production facilities; production-segment compressors at standalone well sites would not be subject to the emissions limit.

Table 8. Proposed Requirements for New and Existing Reciprocating Compressors

Source	NSPS and EG
Reciprocating compressors (except those at standalone well sites)	NSPS and EG: volumetric flow rate \leq 2 scf/minute; alternative compliance option of collecting rod packing emissions and routing to process using a closed-vent system

Wells and Associated Operations

EPA's proposal includes requirements for three distinct processes related to wells: associated gas venting and flaring, liquids unloading, and well completions. Previously, EPA had proposed to define a well as a separate affected facility for each of these three processes. EPA is now proposing to define a well affected facility as a single well and set standards for each process that would be applicable to the newly defined affected facility.

For associated gas venting and flaring at oil wells, EPA proposes to require associated gas to be captured and routed to a beneficial use. EPA proposes the same requirements for new and existing sources. EPA proposes to include routing to a sales line, routing to use as an onsite fuel or other useful purpose that a purchased fuel or raw material would serve, or reinjection into the well or another well for enhanced oil recovery as beneficial uses. This is a change from the 2021 proposal, which listed routing associated gas to a sales line as the only compliance option.

If it is not possible to route associated gas to a beneficial use for technical or safety reasons, the reasoning must be demonstrated by operators and the associated gas must be routed to a control device that achieves a 95 percent reduction in methane and VOC emissions. The supplemental proposal does not allow venting of associated gas under any circumstances. EPA seeks information on potential scenarios that may warrant a venting exemption because beneficial use of associated gas or flaring are not possible.

EPA proposes to require all liquids unloading events to occur with zero methane and VOC emissions, with exemptions for situations where zero-emissions unloadings are not possible for technical or safety reasons. EPA does not set standards for specific technologies or work practices that operators would need to implement during unloadings. In the 2021 proposal, EPA had proposed this option and co-proposed a second option that would have only applied requirements to liquids unloadings that vent emissions to the atmosphere. EPA is now proposing to regulate all unloading events but could still select this second option from the 2021 proposal when the rule is finalized. The 2021 proposal had defined all unloading events as a modification and therefore EPA had only proposed NSPS. Due to the proposed change in the definition of well affected facility, EPA is now proposing the unloadings are not a modification and can therefore occur at existing sources. EPA therefore proposes both NSPS and EG, with identical requirements for new and existing sources.

The supplemental proposal does not include any significant changes to the requirements for well completions, which require use of reduced emissions completions that capture and destroy emissions from most completion events using hydraulic fracturing. Because each well completion or recompletion is considered a new source or modification, EPA only proposes NSPS for these processes; by definition there are no existing sources and therefore EPA does not propose EG.

Table 9. Proposed Requirements for Well Activities

Source	NSPS and EG
Oil wells with associated gas	NSPS and EG: route associated gas to a sales line or other beneficial use; if routing to beneficial use is not technically feasible, route to a control device that achieves 95 percent reduction in methane and VOC emissions (only methane for EG)

Gas well liquids unloading	<p>NSPS: perform liquids unloading with zero methane and VOC emissions EG: perform liquids unloading with zero methane emissions</p> <p>If zero emissions unloadings are not possible for safety or technical reasons, new and existing wells must employ best practices during unloadings to minimize venting to the maximum extent possible</p>
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Storage Tanks

The supplemental proposal maintains the same requirement of 95 percent control of methane and VOC emissions for new and existing storage vessels as proposed in 2021 but makes several other revisions. First, EPA proposes to define a tank battery (the affected facility) as a group of storage vessels that are manifolded together for liquid transfer. An individual tank could represent an affected source if there is only one tank on site or if there are multiple tanks, but they are not manifolded for liquid transfer. Second, EPA proposes to add a 20 tpy methane potential emissions threshold for NSPS applicability. The 2021 proposal only included an emissions threshold of 6 tpy VOC to trigger the NSPS. EPA states that while almost all facilities will hit the 6 tpy VOC threshold before hitting the 20 tpy methane threshold, in some cases the methane number will be triggered before the VOC number. A source would be considered an affected facility under NSPS if either threshold were met. Only the methane threshold would apply for existing sources. Finally, EPA proposes that the model or methodology used to calculate potential methane and VOC emissions from tank batteries must account for flashing, working, and breathing losses.

Table 10. Proposed Requirements for New and Existing Storage Vessels

Source	NSPS and EG
Single storage vessel or tank battery with potential to emit ≥ 6 tpy VOC or ≥ 20 tpy methane (existing sources defined using methane threshold only)	<p>NSPS: 95 percent reduction of methane and VOC emissions EG: 95 percent reduction in methane emissions</p>

Combustion Control Devices

The supplemental proposal requires control devices used at any affected facility to demonstrate that they meet a 95 percent methane and VOC destruction efficiency. Depending on the type of device, control efficiency could be demonstrated by a performance test or manufacturer's test (flares and combustion devices) or a design evaluation (condensers and carbon absorbers). EPA also proposes several requirements intended to ensure that flares and combustion devices are operating properly, including: a continuous pilot flame and monitoring system, monthly inspections for visible emissions, installation of a monitoring system to provide continuous data on the heat content of the gas stream sent to a control device, and installation of a continuous monitoring system to measure the gas flow sent to a control device.

Proposed Requirements for State Plans

Once an NSPS has been issued by EPA under CAA 111(b), CAA section 111(d) requires EPA to develop EG for existing sources. The EG can be used by states as a "model rule" for incorporation into State Implementation Plans (SIPs) submitted to EPA for approval. This allows states to

directly adopt the presumptive standards developed by EPA to achieve compliance with the requirements for existing sources.

Section 111(d) also allows states to submit alternative compliance plans that provide total emissions reductions equal to the EG. Each state that includes a regulated source must develop a SIP to implement the EG or alternative approaches. EPA reviews and approves or disapproves each SIP; if a state does not submit an approvable plan, EPA will promulgate a Federal Implementation Plan (FIP) for the state.

A state plan utilizing alternative approaches would be required to include a demonstration of how the plan would achieve at least equivalent methane emission reductions as under the EG. The supplemental proposal provides guidance for states and Tribal Nations that choose to develop alternative approaches for methane emissions. EPA proposes a three-step process for states to evaluate whether their existing programs are considered equivalent to the presumptive standards on a source-by-source basis. This process seeks to allow states to decide which standards to leverage in their state development plan. The proposed steps include:

- Step 1: Is the designated facility or existing source definition and the pollutant and format of the standards, for example, a numerical emissions limit or a work practice standard, the same as in the EGs? If yes, the state would go to Step 2.
- Step 2: Is the state able to demonstrate the state requirements for existing sources will reduce an equal or greater amount of methane as the presumptive standards in the EGs? States have a variety of options to demonstrate this. If yes, the state will go to Step 3.
- Step 3: Is the state able to demonstrate that the compliance measures under a state program for an existing facility is at least as effective as the presumptive standard's compliance measures? The state must demonstrate that in its plan.

EPA is soliciting public comment on the proposed process to demonstrate that state plans include equal standards of performance and methane reductions as the proposed EG. Specifically, EPA is seeking comments on whether there are any additional factors that should be considered in state equivalency determinations. Further, EPA states in the supplemental proposal that states will be allowed to use trading and averaging to demonstrate equivalency with EG. EPA plans to propose revisions to CAA section 111(d) implementing regulations in the near future that will clarify the ability to use these mechanisms for 111(d) compliance.

EPA proposes exceptions for state plans to include standards that are less stringent than EPA's presumptive standards for existing sources if they meet specific criteria. Less-stringent standards for existing sources are allowed if:

- The cost for implementing control measures is unreasonable due to the facility's age, location, and/or basic process design;
- It is physically or technically impossible to install necessary emission controls;
- There are facility factors that are different than factors considered by EPA in determining BSER.

If states choose to implement less-stringent standards, state plans must include how a less-stringent standard would impact communities vulnerable to that decision. State plans must

describe the impact of a less-stringent standard and include feedback related to a less-stringent standard received through meaningful engagement on the state plan. EPA also proposes to allow states to apply standards that are more stringent than EPA's presumptive standards from the proposed EG.

Additionally, in EPA's 2021 proposal, EPA proposed to require states to perform outreach and meaningful engagement with overburdened and underserved communities during the development of state plans. The supplemental proposal includes additional details and definitions related to engagement requirements. Under the supplemental proposal, state plans must include a list of pertinent stakeholders, a summary of engagement conducted, as well as stakeholder input provided. EPA may reject a SIP or find it incomplete if elements of public participation are missing.

Implementation Timeline

EPA proposes to require states to submit SIPs within 18 months of the publication of final EG. The compliance timeline for existing sources (i.e., when EG come into effect) would be 36 months from the SIP submittal deadline. EPA has not proposed a timeline for which it will act on submitted SIPs but is expected to propose one in a forthcoming CAA section 111(d) implementation rulemaking. The NSPS will go into effect immediately upon publication of a final rule. Table 11 below outlines key dates for compliance, according to a source's construction, modification, or reconstruction date.

Table 11. Key Dates or Compliance, According To A Source's Construction, Modification, Or Reconstruction Date

Date of Construction, Modification, or Reconstruction	Applicable Regulation
After August 23, 2011, and on or before September 18, 2015	2012 NSPS (OOOO). OOOO applies to VOCs not GHGs.
After September 18, 2015 and on or before November 15, 2021	2016 NSPS (OOOOa). Compliance with OOOOa is considered compliance with OOOO.
After November 15, 2021	NSPS to be finalized in 2023 (OOOOb).*
On or before November 15, 2021	EG or equivalents for existing sources (OOOOc)

*The new/existing source cutoff date for centrifugal compressors with dry seals is December 6, 2022. The publication date of the supplemental proposal is used as this source category was not covered in the 2021 proposal.

Alignment with the Inflation Reduction Act Methane Fee

The Inflation Reduction Act (IRA) directs EPA to develop and implement a methane "waste emissions charge" program that would apply a fee to oil and gas operators if their facilities exceed specified methane intensity thresholds. While this program is separate from and does not affect EPA's authority to regulate methane emissions under CAA sections 111(b) and 111(d), the IRA text includes a fee exemption for facilities that are in compliance with 111(b) and 111(d) regulations, if those regulations meet specific criteria. EPA's supplemental proposal does not

address the methane fee program, but solicits feedback on certain elements of the NSPS and EG that will have implications on application of the methane fee and any regulatory exemptions.

Social Cost of Carbon

Federal agencies are required to conduct a cost-benefit analysis of regulations under a 1993 Executive Order (EO 12866). This assessment is included in the proposal's Regulatory Impact Analysis (RIA). For the supplemental proposal, EPA applied the interim social costs of carbon developed by the Interagency Working Group on the Social Cost of Greenhouse Gases (IWG) to estimate the climate benefits of expected methane emissions reductions. EPA emphasizes that the analysis in the RIA mandated by EO 12866 is entirely separate from the analysis used to make the BSER determinations in the supplemental proposal.

EPA released an updated draft estimate of the social cost of carbon as supplementary material to the RIA for the supplementary proposal.² EPA's draft social cost of carbon of \$190/ton for 2020 emissions (using a 2 percent discount rate) is significantly higher than the IWG's interim estimate of \$51/ton (using a 3 percent discount rate). While application of the draft EPA social cost of carbon would affect the supplemental proposal's RIA, because that analysis is separate from the analysis used by EPA to set NSPS and EG, it would not affect the stringency of EPA's proposed rule.

CONCLUSION AND NEXT STEPS

Comments on the supplemental proposal are due to EPA by February 13, 2023. Virtual public hearings will be held on January 10 and 11, 2023 for registered speakers to testify. EPA intends to publish its final rule in 2023.

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² The Environmental Protection Agency, Supplementary Material for the Regulatory Impact Analysis for the Supplemental Proposed Rulemaking, "Standards of Performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review" EPA External Review Draft of Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances, 2022, https://www.epa.gov/system/files/documents/2022-11/epa_scghg_report_draft_0.pdf.