October 2, 2023

The Honorable Michael S. Regan
Environmental Protection Agency
Pennsylvania Avenue NW
Washington DC 20460

Re: Comments on EPA's Greenhouse Gas Reporting Rule: Revisions and Confidentiality Determinations for Petroleum and Natural Gas Systems at 88 Fed. Reg. 50282 (August 1, 2023) (the "Proposed Rule" or "GHGRP")

Docket ID No. EPA–HQ–OAR–2023–0234; FRL–10246–01–OAR
Submitted via e-filing

Dear Administrator Regan:

The Permian Basin Petroleum Association ("PBPA") is the largest regional oil and gas association in the United States. We represent the men and women who work in the oil and gas industry in the Permian Basin of West Texas and southeastern New Mexico. The Permian Basin is the largest inland oil and gas reservoir and the largest oil and gas producing region in the world. PBPA consists of the largest producers as well as the smallest operators in the Permian Basin. Part of PBPA's mission is to promote environmentally conscious operations and sustainable economic profitability among all our members, large and small. Because PBPA's members will be directly impacted by these proposed revisions, if finalized, we are submitting these comments to convey needed revisions.

INTRODUCTION

Before discussing the specific major technical and policy flaws in the proposed rule, it is critical to provide context for its existence and likely impact broadly. First and most important, the proposed rule, in conjunction with efforts to incorporate elements of the the-not-yet-final New Source Performance Standards ("NSPS") and Emissions Guidelines for Greenhouse Gas Emissions from Existing Crude Oil and Natural Gas Facilities ("EG") OOOOb/c pending rule, will dramatically increase the scope and breadth of activities and oil and gas operators that will be subjected to methane emissions reporting requirements. As a result, the intended effect will be to dramatically increase those operations subject to the charge for emissions above 25,000 metric tons of CO2 or its equivalent as established in the Inflation Reduction Act ("IRA").

Utilization of the rulemaking process in this manner is not consistent with the IRA. In fact, the author of the methane charge legislation, Sen. Joe Manchin (D-WV), the Chairman of the Senate Energy and Natural Resources Committee, has made clear that his intention is that only those operations that were subject to Subpart W on the date of enactment are to be subject to the charge. He was particularly concerned about the impact on small to medium producers. In his June 6, 2023, letter to the Environmental Protection Agency ("EPA") regarding concerns over implementation of the charge he wrote:

> *The statute clearly intends to exempt marginal wells and smaller producers from the fee. EPA must make it clearly understood that those entities not subject to the current Subpart W Greenhouse Gas Reporting Program are not subject to EPA fees under MERP.*

Our comments will show in great detail how the requirements under the proposed rule will dramatically increase the number of small and mid-sized operations subject to the charge.

Perhaps most troubling is that the proposed rule, regardless of what operation it applies, is based on faulty, and scientifically flawed, modeling, data, and analysis that will fail to achieve its intended purpose, with no benefit to the environment and the economy. Therefore, the rule should be withdrawn and revised to ensure it conforms to the IRA related provisions and the intent of Congress.

As expressed in the proposal, EPA's aim is "to ensure that reporting is based on empirical data, accurately reflects total methane emissions and waste emissions from applicable facilities, and allows owners and operators of applicable facilities to submit empirical emissions data that appropriately demonstrated the extent to which a charge is owed."[1] PBPA supports that aim. After all, reported emissions will drive the magnitude of our members' methane fees. But if finalized as proposed, EPA would instead compel reporting of unrealistic, inflated emission totals through (a) dis-incentivizing use of monitoring technologies and (b) imposition of unrealistic emission factors.

A defensible reporting rule must incent the use of proven monitoring technologies. Throughout the proposal, EPA links revisions to those proposed for NSPS OOOOb and EG OOOOc. But while EPA's OOOOb/c (and state analogs) incorporate use of monitoring technology, this proposal does not. EPA's proposal, if finalized, would actually deter oil and gas companies from investing in the types of technologies that produce more empirical data.

Also, a defensible reporting rule must not compel the use of unrealistic emission factors or default emission durations where actual data exists. For instance, the proposal arbitrarily assigns an assumed 92% destruction removal efficiency to unmonitored flares—the same efficiency assumed for explosion-related combustion. And as a general matter, EPA's proposed emission factors do not account for the variability that exists in source-level emissions based on differences in operations, basins, and industry sectors. Unrealistic assumptions beget unrealistic emissions reporting.

These two defects alone will result in reporting of unrealistic, inflated emission totals. That not only counters EPA's express aim, but it also would significantly impact PBPA members both in terms of reputation (through unrealistic yet publicly-disclosed emissions data) and finances (through inflating methane fees). Indeed, a PBPA member compared emissions totals as calculated under the existing rule to those calculated under the proposal, and reports that leak emissions would increase

[1] Proposed Rule at 50282.

total company methane emissions by 240%. On its face, that level of variability reflects arbitrary defects in the proposal.

PBPA appreciates this opportunity to comment on EPA's proposal. These and other comments are further detailed below. To better align with EPA's expressed aim and to address these material defects, PBPA requests that the EPA revise the proposal as described to ensure that reporting is based on empirical data that reflects actual methane emissions.

Discussion

I. IRA Requires EPA to Collect Empirical Data, but the Proposed Rule Does not Accomplish that Objective

In the opening lines of the preamble to the Proposed Rule, EPA states that the purpose is "to ensure that reporting is based on empirical data, accurately reflects total methane emissions and waste emissions from applicable facilities, and allows owners and operators of applicable facilities to submit empirical emissions data that appropriately demonstrate the extent to which a charge is owed." That purpose is consistent with the IRA, in which Congress requires the EPA to:

> revise the requirements of subpart W to ensure the reporting under subpart W [and corresponding waste emissions charges under the Clean Air Act ("CAA") section 136] are based on empirical data… accurately reflect the total methane emissions and waste emissions from the applicable facilities, and allow owners and operators of applicable facilities to submit empirical emissions data, in a manner to be prescribed by the Administrator, to demonstrate the extent to which a charge…is owed.[2]

But the Proposed Rule does not ensure that reporting under Subpart W yields empirical data for all sources. Instead, it requires operators to rely on generic emission assumptions that inflate emissions reporting, in some instances up to three times the actual emission amounts. PBPA does not support changes that would lead to unnecessary or inaccurate reporting. Any revisions to the GHGRP should accomplish the intended ends of improved quality and consistency, without resulting in undue costs or inaccuracies in reporting.

As an example, one PBPA member calculated the emissions under the existing reporting rule and compared them to emissions that would be calculated using the Proposed Rule. Nothing changed about the facility's operations. The only change was the methodology for calculating emissions. Specifically, total company methane emissions increased 240% due to leak emissions. Associated gas/flare emissions increased total company methane emissions by 34% due to the Proposed Rule's destruction removal efficiency ("DRE") requirements. Combustion methane slip emissions increased total company methane emissions by 25%. Emissions associated with gas pneumatic controllers

[2] Clean Air Act § 136(h).

increased total company methane emissions by 20%. Emissions associated with reciprocating compressor rod packing increased total company emissions by 18%. But these increases are based on assumptions that do not reflect the empirical data of what actually occurs.

If an emissions tax or fee system as required under IRA is implemented utilizing GHGRP, additional flexibility will need to be provided to truly support quality and consistency in reporting. Studies have shown that similar equipment and production can result in different emission amounts—because of differences in facility design, operation, and maintenance. However, as further described below, the Proposed Rule does not account for these differences, and instead dictates that certain emission factors be used even when they do not accurately reflect actual emissions.

1. Flares

In its Proposed Rule, EPA has identified three tiers of DRE for flares. Tier 1 has a default combustion efficiency of 98 percent if the flare is subject to monitoring consistent with the National Emission Standards for Hazardous Air Pollutants ("NESHAP") standards for Petroleum Refineries. Tier 2 has a default combustion efficiency of 95 percent if the operator complies with the monitoring specified in proposed OOOOb. Finally, the default combustion efficiency under Tier 3, which would apply if neither Tier 1 nor Tier 2 requirements are met, would be 92 percent.[3]

The Tier 3 default combustion efficiency of 92% is the same efficiency established under the proposal for natural gas destroyed/removed in an explosion or an open fire.[4] To equate the destruction/removal efficiency of a flare to an explosion or open flame solely because that flare is not monitored is completely arbitrary. Instead of limiting operators to using overly conservative destruction removal efficiency (comparable to an explosion or open fire), operators should have the flexibility to rely on the tested efficiency as an alternate methodology or demonstrate the accurate removal efficiency of the flare using various other options, such as sampling or modeling.

Furthermore, EPA is also proposing that the Tier 2 DRE of 95% can be used if the operator is in compliance with the yet to be finalized OOOOb. This Proposed Rule's continuous flow monitoring requirement also effectively accelerates the requirements of presumptive standards proposed in EG OOOOc, which will not be formally adopted by states for several years. As discussed in more detail below, it is not appropriate to base portions of this rule on compliance with another yet to be finalized rule, especially considering that the OOOOb/c rules could be entangled in litigation for years. The EPA should have a clear picture of what the final OOOOb/c standards will be before it proposes additional rules that incorporate those standards.

In addition, requiring compliance with 40 CFR 63.670-671 Refinery NESHAPs CC regarding flare monitoring to claim 98% DRE for NSPS OOOOb and OOOOc EG would be a very burdensome option for production facilities. Simply put, the GHGRP shouldn't force upstream operators to comply with downstream standards in order to claim 98% DRE.

[3] Proposed Rule at 50334.
[4] Proposed Rule at 50298.

While PBPA members are reluctant to rely on the findings of a single study as the basis for setting a default DRE of 92%, the Plant *et al.* study found that average combustion efficiencies were approximately 97 percent in the Bakken Basin to slightly more than 92 percent in the Permian Basin. This, in itself, illustrates PBPA's concern about EPA's implementation of a one-size-fits-all standard when there are obvious differences in operations and associated emissions across sites, basins, and industry sectors.

Finally, the Proposed Rule does not incorporate § 63.670(r) or allow for an alternative means of emissions limitation, which would appear to prevent the ability for production operators to determine that they have flares with 98% (or higher) DRE, based on actual operational data. Without the ability to claim actual DRE of 98% or higher based on operational and testing data, the lower DRE Tiers of 95% or 92% will result in over-reporting of emissions, contrary to EPA's intent for more accurate reporting. EPA should add an option to Tier 1 flare monitoring that allows for parametric monitoring to be used in determining destruction efficiency.

2. Large Release Events

EPA states that "large GHG emission releases may also occur from equipment for which there is a calculation methodology and reporting requirement in Subpart W but for which the existing calculation methodologies in Subpart W would significantly underestimate the magnitude of the emissions."[5] To address the concern that certain equipment may result in large GHG releases, EPA is proposing to require the reporting of large emission events by revising the calculation methodology to increase the emission factor for this equipment, resulting in double counting. Such double counting does not result in the empirical data upon which the EPA should rely and upon which a waste emission charge should be assessed.

EPA appears to recognize that there is inherent variability in emissions from sources that may appear to be very similar. In the Proposed Rule, EPA states, "In cases where there is significant variability in source-level emissions and the default emission factors are thus not appropriately representative of facility-level emissions, and other calculation methodologies are available that are representative of facility-level emissions, we are proposing to remove default emission factors."[6] PBPA members affirm that variability exists in source-level emissions based on differences in operations, basins, and industry sectors that are not accounted for in the emission factors EPA has proposed.

3. Pneumatics

Calculation Method 2. PBPA recommends that instead of requiring direct measurement of emissions from each pneumatic device under Calculation Method 2, operators should be allowed to base emission calculations on a representative sample. As discussed in the Oil and Gas Methane Partnership 2.0 guidance document, *Reconciliation and Uncertainty in Methane Emissions Estimates for*

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[5] EPA, *Greenhouse Gas Reporting Rule: Technical Support for Revisions and Confidentiality Determinations for Data Elements Under the Greenhouse Gas Reporting Rule; Proposed Rule – Petroleum and Natural Gas Systems*, at 25.
[6] Proposed Rule at 50289.

OGMP2.0, a site-level measurement conducted for a statistically representative sample should be a sufficient basis for emission calculations. While more complex sites with smaller populations may require more sampling, simple sites with robust populations require less sampling and certainly do not require direct measurement of each source:

> For example, a population of valves or even simple production sites with fewer sources would require fewer measurement samples to characterize compared to a population of complex central tank batteries. Similarly, pipe segments, meter runs, and pressure regulating stations are likely simple. The sampling recommendations are provided in terms of the percentage of the total population that should be sampled. Directionally, as a population size increases, a smaller percentage of the sites will require measurement, though the absolute number of facilities may increase. Selection of sampling size should consider technical, time and resource constraints.[7]

Calculation Method 3. PBPA recommends that under Calculation Method 3, it should not be assumed that malfunctioning devices have, in fact, been malfunctioning for the entire year. Instead, the malfunction should be assumed to extend to the most recent inspection date or the previous reporting year, whichever is less. However, if there is data indicating that the malfunction occurred at some time after the most recent inspection date or during the most recent reporting year, the more recent date may be used for calculating emissions.

Furthermore, PBPA recommends that operators may treat inspections for malfunctioning devices as representative samples that may be used to calculate emissions for those devices that are not inspected. Consistent with our recommendation above, when a sufficient number of inspections have been conducted, operators should be able to rely on this representative sample instead of monitoring each device individually.

Calculation Method 4. With regard to Calculation Method 4, EPA requested comment regarding potential revisions to the intermittent bleed pneumatic device population emission factors. PBPA supports EPA incorporating the default population count factor 8.8 scf/hr/device for unmonitored devices, similar to how it proposes a default population count factor of 6.8 for low bleed devices. Then as proposed, for operators that choose to monitor their intermittent devices, the factor of 2.82 scf/hr/device would be applied to properly functioning devices, and the factor of 16.2 would be applied to malfunctioning intermittent bleed pneumatic devices.

II. Operations and Facilities Vary Between Upstream, Midstream, and Downstream Oil and Gas Sectors and Should Not Be Treated the Same

The Proposed Rule treats certain equipment used in upstream, midstream, and downstream sectors the same despite the fact that they are used very differently within each sector of the oil and gas industry. While administratively efficient, the one-size-fits-all approach does not result in

[7] Oil and Gas Methane Partnership 2.0 guidance document, *Reconciliation and Uncertainty (U&R) in Methane Emissions Estimates for OGMP2.0*, at 11.

gathering empirical data because it ignores the differences in the purpose and operation of equipment used in multiple sectors.

For example, flares often operate at low pressures when used in upstream operations, whereas flares are operated at high pressures for downstream uses. Despite these different operations, the monitoring requirements in the Proposed Rule make no distinction between flares used in the upstream and downstream sectors.

Furthermore, there are distinct geographic differences that mandate the upstream, midstream, and downstream sectors be treated differently. Upstream and midstream assets are spread across large areas and are typically unmanned, whereas downstream assets are located in concentrated areas and are manned.

The compressor testing requirements for pressurized/standby mode are another example. It appears that these standards are copied from or modeled directly after the requirements for plants. The sheer number of compressors utilized in upstream operations and spread over large geographic areas does not appear to have been considered in the development of the Proposed Rule. These tests can be accomplished in roughly three to four weeks for plants. PBPA recommends that operators be allowed to use a representative sample for compressor testing due to the significant time and costs needed to test these facilities spread over such a large geographic area and the need to shut down operations in order to perform these tests.

III. Proposed Rule Fails to Incentivize Technology That Would Actually Provide Empirical Data

Unlike the proposed OOOOb and OOOOc rules, this Proposed Rule does not incentivize the use of new and advanced technologies and would, in fact, deter oil and gas companies from investing in the types of technologies that could provide more empirical data. At a minimum, oil and gas operators should at least be able to rely on using the same technologies for collection of empirical data that state air regulators have approved for use in their air programs (*e.g.*, New Mexico).

For example, in the Proposed Rule, EPA makes the case that remote sensing data cannot be used to extrapolate annual emissions data, arguing that these measurements are taken over limited durations or when certain meteorological conditions exist, and that the detection limits are too high to detect emissions from sources with relatively low emission rates.[8] To the contrary, PBPA believes this type of data collection is designed to ensure that there is no double counting and, based on the experience of our members, does not result in undercounting.

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[8] Proposed Rule at 50291.

IV. EPA's Proposed Rule Incorporates Portions of Other Rules Which Have Not Been Finalized

EPA should not propose a rule (GHGRP) that incorporates portions of another proposed rule that is not yet final (OOOOb/OOOOc). Significant portions of the Proposed Rule are contingent upon the finalization of a rule that is not only in the middle of its own comment review period and subject to change, but that could likely be the subject of multi-year litigation. Any changes that are made by the EPA to the OOOOb/OOOOc rules in response to comments or changes that may be required by the courts, will necessarily impact the implementation of the proposed GHGRP.

Specifically, EPA states that the final Subpart W amendments "would reference the final version of the method(s) in the NSPS OOOOb and EG OOOOc."[9] This is presumptive rulemaking at best, and would likely violate the Administrative Procedures Act, because the final version of OOOOb and OOOOc have not been published or referenced in the GHGRP proposal. Of course, this assumes that these rules are actually finalized. Any reference to these final rules is presumptive and cannot be relied upon by the regulated community because no one, at least not in the public, actually knows what the final rule will look like.

V. Flare Requirements in the Proposed Rule are Inconsistent with OOOOb and OOOOc

While the Proposed Rule specifically states that Amendments to Subpart W will reference the final version of the method(s) in the NSPS OOOOb and presumptive standards proposed in EG OOOOc, the Proposed Rule also contains glaring inconsistencies with those same proposed rules.

The most obvious example of the differences between the various proposals relates to flare requirements. In addition to inconsistencies with OOOOb and OOOOc, the Proposed Rule is also inconsistent with the NESHAP requirements for Petroleum Refineries, which the Proposed Rule requires operators to comply with in order to claim 98% DRE. Included in Attachment A is a summary of the inconsistencies among these three existing or proposed rules specifically related to flare requirements.

VI. EPA is Attempting to Incorporate Requirements in this Reporting Rule that Belong in Other Regulations

PBPA recommends that EPA refrain from including operational requirements that may have been left out of the OOOOb and OOOOc proposal into the Proposed (Reporting) Rule. Specifically, it appears EPA is attempting to bootstrap requirements into this rule that it failed to include in the OOOOb and OOOOc proposal when it states:

> Because the proposed standards in NSPS OOOOb and the proposed presumptive standards in EG OOOOc are not the same as the requirements in subpart W, <u>the EPA is proposing a few additional requirements</u> under subpart W for compressors subject to the proposed standards in NSPS OOOOb or standards in an applicable approved

[9] Proposed Rule at 50288.

> state plan or applicable Federal plan codified in 40 CFR part 62. Subpart W requires measurement of compressor sources that would not be required to be measured under the proposed standards in NSPS OOOOb and the proposed presumptive standards in EG OOOOc (*e.g.,* blowdown valve leakage through the blowdown vent). The EPA is proposing that reporters conducting measurements of compressors under NSPS OOOOb or the applicable approved state plan or applicable Federal plan in 40 CFR part 62 would conduct measurements of any other compressor sources required to be measured by subpart W at the same time.

The Proposed Rule also includes a massive new set of recordkeeping requirements (as well as reporting obligations) for operators of produced water tanks. EPA should have included those recordkeeping requirements in the OOOOb proposal instead of trying to squeeze them into a reporting rule.

Additionally, EPA is seeking comment on what quantification techniques would be best suited for measuring emissions from pipeline leaks and whether these techniques require digging down to the pipeline in order to quantify emissions and also verify pipeline characteristics. Digging down to buried pipelines to quantify emissions and verify pipeline characteristics goes far beyond the scope of "reporting" requirements. Such onerous and costly requirements are not justified, especially when such information can be acquired through data analysis, sensors, and leak surveys.

VII. Facilities Covered under Proposed Rule are Confusing and Inconsistent with IRA

As PBPA commented in its October 5, 2022 Comment Letter regarding the EPA's proposed revisions in June of 2022:

> The EPA should take great care in understanding the interaction between [the IRA], other proposed rules and the agency's proposed revisions to the GHGRP. These revisions will have consequences on those other actions and vice versa. If those consequences result in confusion, inaccuracies in reporting, or a lack in quality of reported data, EPA's stated intent for revisions to the GHGRP will not be achieved. Therefore, if EPA chooses to take no time to reconcile contradictions or inaccuracies between the proposed GHGRP revisions and other proposed rulemakings, it is highly likely additional proposed revisions will be needed sooner rather than later.

Not only are flare requirements inconsistent between the Proposed Rule, OOOOb and OOOOc, and the Refinery NESHAP, the Proposed Rule's definitions are also inconsistent with the IRA and will lead to confusion and unreliable reporting.

To be clear, gathering and boosting is specifically listed under IRA as **<u>nonproduction</u>** for assessing the methane fee. Section 136(f) of the IRA provides:

(2) NONPRODUCTION PETROLEUM AND NATURAL GAS SYSTEMS.—

> With respect to imposing and collecting the charge under subsection (c) for an applicable facility in an industry segment listed in paragraph (3), (6), (7), or (8) of subsection (d), the Administrator shall impose and collect the charge on the reported metric tons of methane emissions that exceed 0.05 percent of the natural gas sent to sale from or through such facility.[10]

However, it appears the Proposed Rule conflates the terms in such a way that gathering and boosting are considered a part of "centralized production sites" that are considered **production** facilities. These proposed definitions are neither consistent with the Pipeline and Hazardous Material Safety Administration's definitions, which do not include any production facilities as part of gathering,[11] nor with how such sites are regulated under OOOOa, and proposed OOOOb/c.

The Proposed Rule defines "centralized oil production site" as follows:

> DEFINITION: *Centralized oil production site* means any permanent combination of one or more hydrocarbon liquids storage tanks located on one or more contiguous or adjacent properties that does not also contain a permanent combination of one or more compressors that are part of the onshore petroleum and natural gas gathering and boosting facility that gathers hydrocarbon liquids from multiple well-pads. A *centralized oil production site* is a type of gathering and boosting site for purposes of reporting under § 98.236.[12]

The Proposed Rule then goes on to define a "gathering and boosting site" as including centralized oil production sites within the gathering and boosting industry segment:

> DEFINITION: *Gathering and boosting site* means a single gathering compressor station as defined in this section, **centralized oil production site** as defined in this section, gathering pipeline site as defined in this section, or other fenceline site within the onshore petroleum and natural gas gathering and boosting industry segment.[13]

The definitions included in this Proposed Rule should be harmonized with those in the IRA to provide clarity to the regulated community and ensure consistency in how facilities are characterized across regulatory programs.

CONCLUSION

PBPA supports attempts to improve the accuracy of the GHGRP and appreciates the opportunity to comment on EPA's proposal. On behalf of our members, and in hopes of promoting reporting quality and consistency, we respectfully submit these comments to the EPA and request

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[10] Proposed Rule at 50436.
[11] *See* 49 C.F.R. § 192.7.
[12] Proposed Rule at 50436.
[13] Proposed Rule at 50437.

they be taken into consideration in the development of the final rule. PBPA appreciates your time in reviewing and considering these comments.

Regards,

Ben Shepperd

Ben Shepperd
President
Permian Basin Petroleum Association

ATTACHMENT A

Comparison of Flare Monitoring Requirements in OOOOb/c, GHGRP, and Refinery NESHAP

Requirement	**OOOOb/c** (allows claiming 95% DRE per 40 CFR 98 W)	**GHGRP 40 CFR W** (required for all flares, regardless of DRE Tier)	**40 CFR 63.670-671** (allows claiming 98% DRE per 40 CFR 98 W)
Continuous parameter monitoring to determine gas flow to the flare	"…continuous parameter monitoring system to determine the flow of gas sent to the flare or combustor, except as noted below for pressure-assisted devices. Alternatively, the owner or operator may conduct an initial engineering assessment of the sources vented to the flare to demonstrate that, based on the maximum pressure of these sources, the maximum possible gas flow rate would not exceed the allowed maximum flare tip velocity in 40 CFR 60.18 or the maximum design flow rate of the enclosed combustor."	"…for all flares, regardless of the tier discussed above, we are proposing to require at least continuous parameter monitoring to determine gas flow to the flare. Specifically, the proposed revisions to 40 CFR 98.233(n)(1) specify that the flow rate determination must be based on direct measurement using a flow meter if one is present, or if a flow meter is not available, it must be based on indirect calculation of flow using continuous parameter monitoring…"	"Flare vent gas, steam assist and air assist flow rate monitoring. The owner or operator shall install, operate, calibrate, and maintain a monitoring system capable of continuously measuring, calculating, and recording the volumetric flow rate in the flare header or headers that feed the flare as well as any flare supplemental gas used…" Mass flow monitors may be used for determining volumetric flow rate of flare vent gas provided the molecular weight of the flare vent gas is determined using compositional analysis…so that the mass flow rate can be converted to volumetric flow at standard conditions... Continuous pressure/temperature monitoring system(s) and appropriate engineering calculations may be used in lieu of a continuous volumetric flow monitoring system provided the molecular weight of the gas is known. The owner or operator shall determine Vtip on a 15-minute block average basis according to the following requirements… (1) use design and engineering principles to determine the unobstructed cross sectional area of the flare tip. (2) determine the cumulative volumetric flow of flare vent gas for each 15-minute block average period using the data from the continuous flow monitoring system required…"
Continuous parameter monitoring for the presence of pilot flame or combustion flame	"...all flares and enclosed combustion devices to have a continuous pilot flame and install a continuous parameter monitoring system capable of continuously (at least once every 5 minutes) monitoring for the presence of a pilot or combustion flame."	"…for all flares, regardless of the tier discussed previously in this section, we are proposing in 40 CFR 98.233(n)(2) to require either continuous monitoring (proposed 40 CFR 98.233(n)(2)(i)) **or** visual inspection at least once per month (proposed 40 CFR 98.233(n)(2)(ii))…"	"…continuously monitor the presence of the pilot flame(s) using a device (including, but not limited to, a thermocouple, ultraviolet beam sensor, or infrared sensor) capable of detecting that the pilot flame(s) is present." "…each flare with a pilot flame present at all times when regulated material is routed to the flare."

Comparison of Flare Monitoring Requirements in OOOOb/c, GHGRP, and Refinery NESHAP

Requirement	**OOOOb/c** (allows claiming 95% DRE per 40 CFR 98 W)	**GHGRP 40 CFR W** (required for all flares, regardless of DRE Tier)	**40 CFR 63.670-671** (allows claiming 98% DRE per 40 CFR 98 W)
Visible Emissions Flare Monitoring	"…require inspections to monitor for visible emissions using section 11 of EPA Method 22 of appendix A-7 of part 60 (EPA Method 22). The observation period for the EPA Method 22 inspection would be 15 minutes. Visible emissions longer than 1 minute during the 15-minute period would be a deviation of the standard. This is consistent with similar requirements in NSPS OOOOa. The EPA is proposing that these inspections would occur monthly, and at other times as requested by the Administrator."	N/A (the only visual monitoring is the option of monthly visual inspection of pilot flame or combustion flame noted above)	"…conduct an initial visible emissions demonstration using an observation period of 2 hours using Method 22 at 40 CFR part 60, appendix A-7. The initial visible emissions demonstration should be conducted the first time regulated materials are routed to the flare. "…no visible emissions, except for periods not to exceed a total of 5 minutes during any 2 consecutive hours, when regulated material is routed to the flare and the flare vent gas flow rate is less than the smokeless design capacity of the flare." "Subsequent visible emissions observations must be conducted using either…: (1) At least once per day for each day … conduct visible emissions observations using an observation period of 5 minutes using Method 22 at 40 CFR part 60, appendix A-7…" OR (2) "Use a video surveillance camera to continuously record…images of the flare flame…"
Gas Composition	N/A (other than the requirement to continuously monitor or complete initial assessment/demonstration of net heating value below)	"The proposed options are to use a continuous gas composition analyzer or to take samples for compositional analysis at least once each quarter in which the flare operated. If a continuous gas analyzer is used, then the measured data would be required to be used to calculate flared emissions."	"**Flare vent gas composition monitoring.** The owner or operator shall determine the concentration of individual components in the flare vent gas using either… (1)… a monitoring system capable of continuously measuring (*i.e.,* at least once every 15-minutes)" OR (2)"… a grab sampling system capable of collecting [samples] at least once every eight hours."

Comparison of Flare Monitoring Requirements in OOOOb/c, GHGRP, and Refinery NESHAP

Requirement	**OOOOb/c** (allows claiming 95% DRE per 40 CFR 98 W)	**GHGRP 40 CFR W** (required for all flares, regardless of DRE Tier)	**40 CFR 63.670-671** (allows claiming 98% DRE per 40 CFR 98 W)
Heating Value	"…Owners and operators would install <u>a continuous parameter monitoring system</u> … to continuously determine the net heating value of the gas sent to the flare or combustor. <u>Alternatively</u>, the owner or operator could conduct an initial assessment to demonstrate that the net heating value of the vent gas sent to the flare or combustor consistently exceeds the required minimum net heating value in 40 CFR 60.18 or the minimum net heating value proposed for pressure-assisted flares." "For pressure-assisted devices, the EPA is proposing to include special provisions in NSPS OOOOb/EG OOOOc, which include a minimum net heating value (NHV) of the gas sent to the flare/combustor of <u>**800**</u> British thermal units per standard cubic feet (Btu/scf)…" "…net heating value of the gas being combusted being 7.45 MJ/scm (<u>**200**</u> Btu/scf) or greater if the flare is nonassisted." [40 CFR 60.18(c)(3)(ii)]	"…require all reporters to use either a flare-specific HHV <u>or</u> individual flared gas stream-specific HHVs in the calculation…require the use of a flare-specific HHV when composition of the inlet gas to the flare is measured or when flow-weighted concentrations of the inlet gas are calculated from measured flow and composition of each of the streams routed to the flare."	"Except as provided in paragraphs (j)(5) and (6) of this section, the owner or operator shall install, operate, calibrate, and maintain <u>a calorimeter capable of continuously</u> measuring, calculating, and recording NHVvg at standard conditions… (5) Direct compositional or net heating value monitoring is not required for purchased ("pipeline quality") natural gas streams. The net heating value of purchased natural gas streams may be determined using annual or more frequent grab sampling at any one representative location. Alternatively, the net heating value of any purchased natural gas stream can be assumed to be <u>**920**</u> Btu/scf. (6) Direct compositional or net heating value monitoring is not required for gas streams that have been demonstrated to have consistent composition (or a fixed minimum net heating value)… "Dilution operating limits for flares with perimeter assist air. Except as provided in paragraph (f)(1) of this section, for each flare actively receiving perimeter assist air, the owner or operator shall operate the flare to maintain the net heating value <u>**dilution**</u> parameter (NHVdil) at or above <u>**22**</u> British thermal units per square foot (Btu/ft 2) determined on a 15-minute block…" For nonassisted flares: "**Combustion zone operating limits.** For each flare, the owner or operator shall operate the flare to maintain the net heating value of flare combustion zone gas (NHVcz) at or above <u>**270**</u> British thermal units per standard cubic feet (Btu/scf) determined on a 15-minute block period basis…"