

MEMORANDUM

FROM: Akachi Imegwu, U.S. EPA, Climate Change Division

TO: Docket EPA-HQ-OAR-2011-0512, Mandatory Reporting of Greenhouse Gases: Technical Revisions to the Petroleum and Natural Gas Systems Category of the Greenhouse Gas Reporting Rule

DATE: December 2, 2011

SUBJECT: Summary of comments on Subpart W of the final Mandatory Reporting of Greenhouse Gases Rule (40 CFR Part 98) after promulgation that are addressed in the final rule action: Mandatory Reporting of Greenhouse Gases: Technical Revisions to the Petroleum and Natural Gas Systems Category of the Greenhouse Gas Reporting Rule

1.0 INTRODUCTION

The 2010 final rule for Subpart W of the Greenhouse Gas Reporting Rule (Subpart W) was signed by EPA Administrator Lisa Jackson on November 8, 2010 and published in the Federal Register on November 30, 2010 (75 FR 74458). The 2010 final rule, which became effective on December 31, 2010, included reporting of GHGs from facilities containing petroleum and natural gas systems. The rule does not require control of GHGs, rather it only requires that facilities containing petroleum and natural gas systems with emissions sources above certain threshold levels monitor and report emissions and other related data.

Since promulgation of the final rule in November 2010, EPA proposed the “Technical Corrections, Clarifying and Other Amendments to Certain Provisions of the Mandatory Greenhouse Gas Reporting Rule” on August 4, 2011 (76 FR 47392) and the “Technical Revisions and Clarifications to Subpart A, Subpart I, and Subpart W” on September 9, 2011 (76 FR 56010). Stakeholders were given the opportunity to comment on these proposed rules. As a result of those comments, EPA is making technical and editorial revisions to specific provisions in Subpart W. In addition, the Administrator has identified within Subpart W a number of technical issues that need to be revised and specific provisions that need to be clarified.

The purpose of this memorandum is to describe the extent of EPA’s outreach efforts for Subpart W of Part 98, summarize specific comments received during the comment period, and outline the issues being addressed by the amendments.

2.0 SUMMARY OF EPA OUTREACH ACTIVITIES ON THE GREENHOUSE GAS PROGRAM

EPA has conducted an extensive outreach program for the Greenhouse Gas Program, including meetings with trade associations and individual businesses, on-line web-based seminars (webinars), and training sessions for EPA Regional Offices. A subset of those meetings was specifically targeted for Subpart W reporters. The following table lists those meetings and webinars that EPA has conducted to date, along with the month and year of the

activity. When available, the table also includes the approximate attendance for the meeting or webinar. In addition, the meetings and webinars that were specifically targeted to subpart W reporters are in **yellow** highlighted text.

POST-SIGNATURE MEETINGS AND WEBINARS

Month and Year of Information Meeting or Webinar
Organization or Location (estimated attendance, if available)
Sept 2009
EPA Regional Offices Briefing (100)
Agriculture community teleconference (100)
State and Local Agencies teleconference (100)
Clean Energy Group Meeting (about 40)
State of Washington (2)
Business Council (73)
Call with Massachusetts on data system (2)
Overview webinar (293)
US Climate Action Partnership (20)
Overview webinar (284)
National Cooperative Refinery Association, and Van Arsdall & Associates
Oct 2009
Oil and Gas Compact (30)
Portland Cement Assoc. (20)
CENSARA(50)
Overview webinar (217)
Applicability Tool Demonstration (84)
National Lime Assoc. (3)
Detailed webinar (252)
EI (80)
NACAA (75)
Nitric Acid and Ammonia Assoc.(30)
TFI, AISI, SMA
Overview webinar (176)
Detailed webinar (208)
Air Program Managers and staff (25)
Detailed webinar (206)
Aluminum Industry
Steel Manufacturers Assoc.
Natural Gas Star
Overview webinar (133)
Carolina Air Pollution Control Assoc. (400)
Applicability Tool Demonstration (238)
Waste Management and Equipment Companies (25)
Ohio Manure Storage
Overview webinar (251)
Corporate Climate Regulation, Chicago, IL
Midwest Transportation & Air Quality Conference
Detailed webinar (333)

POST-SIGNATURE MEETINGS AND WEBINARS

Month and Year of Information Meeting or Webinar Organization or Location (estimated attendance, if available)
TCR/CAA (90)
Environmental Groups (10)
API
NOV 2009
Misc. Meetings with Industries (Refineries, Pulp and Paper, Cement) (100)
Northeast Gas Assoc.
Ecology and Environment, Inc. (2)
Detailed webinar (253)
TCR
Tribal Air Coordinators (50)
GHG data exchange discussion with New Mexico (8)
API (20)
ABA (100)
Training for three regional cap and trade programs – DC (70)
State-EPA Dialogue - DC (80)
Treated Wood Council (60)
Detailed webinar (172)
MAPI (Manufacturing Alliance) (15)
Environmental Services Corporation (150)
Western Climate Initiative partner meeting – Santa Fe (50)
Detailed webinar (171)
Regional Climate sub-leads (40)
Air Products (5)
Waste Management and others (10)
Detailed webinar (96)
DEC 2009
AWMA-EPA- RTP (100)
Envirosys (4)
Detailed webinar (50)
ACC (5)
National Grid
Detailed webinar (91)
Utilitpoint and Allegro (115)
CARB
NPRA and API
Golder and Associates
Anadarko (10)
Kinder Morgan
EEI
SWANA- LFGTE
Thermo Fisher Scientific
EPA Region 4 Training (100)
Waste Management and others (8)
Air Products (5)

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Month and Year of Information Meeting or Webinar Organization or Location (estimated attendance, if available)
The Fertilizer Institute
ADM (8)
JAN 2010
Detailed webinar (83)
Air Products
National Emissions Inventory (30)
OECA- Regional offices (30)
National Grid
Alliance of Automobile Manufacturers (9)
Detailed webinar (100)
NRPA (300)
Feb 2010
Dedicated webinar for American Colleges and Universities (220)
EPA Regional Inventory, Enforcement (23)
University Challenge
State webinar (200)
Webinar (182)
Iowa Landfill operators (125), Asphalt Paving Association of Iowa (70), and the Iowa Chapter of AMWA (60).
Mar 2010
Inst. Of Clean Air Companies (23)
SWANA (200)
EPA AFS Compliance Meeting
Second Nature (Colleges/Universities) Panel (20)
ECOS (50)
PCA
Training- EPA Regions 5 and 7 (180)
Iowa Landfills (50)
April 2010
Arkansas Environmental Federation, Little Rock (160)
NACAA Emissions and Modeling Committee (30)
Webinar (75)
Central TX AWMA (50)
Chicago Exchange Meeting
Exchange Network National Meeting (50)
EPA Air Division Directors (20)
National Assoc. of Clean Water Agencies
Pepsico-Frito Lay (150)
Pacific NW Legislative Energy Horizon Inst./AGA (35)
May 2010
LA, Boise, Portland Training (150, 100, 70, respectively)
ESC Users Group (150)
NCASI
EPRI CEMUG (150)
June 2010

POST-SIGNATURE MEETINGS AND WEBINARS

Month and Year of Information Meeting or Webinar Organization or Location (estimated attendance, if available)
Webinar: Q&A Session (54)
October 2010
e-GGRT Training (748)
e-GGRT Training (566)
November 2010
e-GGRT Training (521)
Webinar: Subpart FF (44)
General Stakeholder Call: Subparts RR and UU (88)
December 2010
EPA Regional Offices Briefing
NACAA
Webinar: Subpart I (71)
Webinar: Subpart W (481)
Webinar: Subparts RR and UU (77)
Webinar: e-GGRT and OTAQREG Training (386)
Webinar: Subpart W (130)
January 2011
Webinar: Subpart W (138)
Webinar: e-GGRT Training (512)
February 2011
Webinar: Overview (98)
EI: Subpart RR
May 2011
Webinar: Overview
Webinar: Subpart OO
June 2011
Webinar: Overview
November 2011
Webinar: Subpart W

3.0 SUMMARY OF COMMENTS BEING ADDRESSED BY THE AMENDMENTS

EPA received over 59 comment submissions from 49 separate reporting entities during the public comment period for both the August 4, 2011 (76 FR 47392) proposed rule and the September 9, 2011 proposed rule (76 FR 56010).

A portion of the comments have been resolved by providing further guidance and clarification to reporters through responses to comments without requiring a change to the rule. However, several comments have resulted in amendments to specific provisions in Subpart W in order to provide more clarity and to correct errors.

The EPA has also held meetings with several trade associations representing industries affected by Part 98, and many questions were presented by those trade associations that would be resolved through the amendments to Subpart W.

For a summary of the submitted comments which are being addressed by technical revisions to Subpart W, please see Appendix A, "Summary of Comments Being Resolved By

Technical Corrections, Clarifying and Other Amendments.” Any specific identifying information from the incoming questions has not been included in Appendix A.

4.0 SUMMARY OF ISSUES FROM INTERNAL REVIEW BEING ADDRESSED BY THE AMENDMENTS

As mentioned above, not all of the corrections and other amendments correspond directly to questions that were raised by reporters. The need for some corrections and other amendments were identified as a result of internal EPA review. For a summary of the issues that have been raised from the EPA’s review of Subpart W of Part 98 which are being addressed by the 2011 “Technical Corrections, Clarifying and Other Amendments”, package, please see Appendix B, “Summary of Issues From Internal Review Being Addressed by Amendments”.

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Summary Of Comments Being Resolved By The Technical Corrections, Clarifying and Other Amendments Package

Technical Issue	Questions Submitted to EPA	Type and approximate number of submittals	Reference
Subpart W – Petroleum and Natural Gas			
<p>1. Standard temperature and pressure have been changed from 68°F and 14.7psia to 60°F and 14.7psia in equations W-1, W-2, W-5, W-13, W-14A, W-14B, W-15, W-15, W-29, W-30A, W-30B, W-31, W-33, W-34, and W-36, and Tables W-1A, W-2, W-3, W-4, W-5, W-6, and W-7.</p>	<p>Technical Corrections, Clarifying and Other Amendments to Certain Provisions of the Mandatory Reporting of Greenhouse Gases Rule</p> <p>Inconsistent Use of Standard Conditions</p> <p>No revisions were made in Subparts A or W to allow for the consistent use of industry standard conditions (60 °F and 14.7 psia). Even with the August 4, 2011 proposed technical amendments, there are numerous inconsistencies in the standard conditions applied in Subpart W. The following table summarizes the different temperatures used for standard conditions in Subpart W.</p> <p>Table 1. Summary of Standard Conditions Used in Subpart W.</p> <p>Equations W-1 and W-2 Standard Conditions: 50.6 °F and 14.7 psia (derivation is provided in comment W.1, below)</p> <p>Equation W-3 Standard Conditions: Equation indicates that the resulting volumetric emissions are at actual conditions, though the metered vent rate is likely to be at standard conditions , which for industry would correspond to 60 °F and 14.7 psia</p> <p>§98.233(d)(4) Standard Conditions: AmineCalc uses industry standard conditions of 60 °F and 14.7 psia</p> <p>Equation W-4 Standard Conditions: Equation indicates that the resulting volumetric emissions are at actual conditions, though inlet and outlet flow rate are likely tracked at standard conditions, which for industry would correspond to 60 °F and 14.7 psia</p>	<p>At least 1 individual.</p>	<p>Comment Submission</p>

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	<p>§98.233(e)(1) Standard Conditions: GlyCalc uses industry standard conditions of 60 °F and 14.7 psia</p> <p>Equation W-5 Standard Conditions: Provides emission factors for both standard temperatures of 60 °F and 68 °F</p> <p>Equation W-6 Standard Conditions: Equation indicates that the resulting volumetric emissions are at standard conditions, which for industry would correspond to 60 °F and 14.7 psia</p> <p>Equation W-7 Standard Conditions: Equation indicates that the resulting volumetric emissions are at actual conditions, though flow rates are likely tracked at standard conditions, which for industry would correspond to 60 °F and 14.7 psia</p> <p>Equations W-8 and W-9 Standard Conditions: Equation indicates that the resulting volumetric emissions are at actual conditions, though the pressure correction results in standard conditions of 14.7 psia. The equations do not include a temperature correction.</p> <p>Equation W-10 Standard Conditions: Equation indicates that the resulting volumetric emissions are at standard conditions, which for industry would correspond to 60 °F and 14.7 psia</p> <p>Equations W-11 and W-12 Standard Conditions: Equation results in volumetric emissions at actual conditions</p> <p>Equation W-13</p>		

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	<p>Standard Conditions: Equation indicates that the resulting volumetric emissions are at actual conditions. ([COMMENTER] recognizes the equation is corrected to standard conditions in the September 9, 2011 amendments.) The emission factor is based on standard conditions at 60 °F and 14.7 psia</p> <p>Equation W-14 Standard Conditions: Equation indicates that the resulting volumetric emissions are at standard conditions, which for industry would correspond to 60 °F and 14.7 psia</p> <p>§98.233(j)(1) Standard Conditions: E&P Tanks uses the standard conditions associated with the input gas analysis, which for industry would correspond to 60 °F and 14.7 psia</p> <p>§98.233(j)(2)-(4) Standard Conditions: Calculation methodologies will result in volumetric emissions at standard conditions, which for industry would correspond to 60 °F and 14.7 psia</p> <p>Equation W-15 Standard Conditions: Calculation methodologies will result in volumetric emissions at standard conditions. Emission factors are based on standard conditions at 68 °F and 14.7 psia. Comment W.10 below provides the emission factors for industry standard conditions of 60 °F and 14.7 psia</p> <p>Equation W-16 Standard Conditions: Calculation methodologies will result in volumetric emissions at standard conditions, which for industry would correspond to 60 °F and 14.7 psia</p> <p>Equations W-17 and W-18 Standard Conditions: Equations indicate that the resulting volumetric emissions are at actual conditions, however the GOR is typically reported at industry standard conditions of 60 °F and</p>		

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	<p>14.7 psia</p> <p>Equations W-19 and W-20 Standard Conditions: Equations indicate that the resulting volumetric emissions are at actual conditions</p> <p>Equations W-22 through W-24 Standard Conditions: Equations indicate that the resulting volumetric emissions are at standard conditions, which for industry would correspond to 60 °F and 14.7 psia</p> <p>Equation W-25 Standard Conditions: Calculation methodologies will result in volumetric emissions at standard conditions. Emission factors are provided for both standard temperatures of 68 °F and 60 °F</p> <p>Equations W-26 and W-27 Standard Conditions: Equations indicate that the resulting volumetric emissions are at standard conditions, which for industry would correspond to 60 °F and 14.7 psia</p> <p>Equation W-29 Standard Conditions: Calculation will result in volumetric emissions at standard conditions. Emission factors are provided for both standard temperatures of 68 °F and 60 °F</p> <p>Equations W-30 and W-31 Standard Conditions: Calculations will result in volumetric emissions at standard conditions. Some of the emission factors in Table W-2, W-3, W-4, W-5, W-6 and W-7 are provided for standard conditions of 68 °F and 14.7 psia. Table 2 at the end of this document provides the emission factors for 60 °F and 14.7 psia based on a correction factor of 519.67/527.67.</p> <p>Equation W-32</p>		

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	<p>Standard Conditions: Equations indicate that the resulting volumetric emissions are at standard conditions, which for industry would correspond to 60 °F and 14.7 psia</p> <p>Equations W-33 and W-34 Standard Conditions: Converts actual volumetric emissions to standard conditions, which for industry would correspond to 60 °F and 14.7 psia</p> <p>Equation W-35 Standard Conditions: Equation indicates that the resulting volumetric emissions are at standard conditions, which for industry would correspond to 60 °F and 14.7 psia</p> <p>Equation W-36 Standard Conditions: Calculation will result in volumetric emissions at standard conditions. Density factors are provided for both standard temperatures of 68 °F and 60 °F</p> <p>Equations W-37, W-38, and W-40 Standard Conditions: Equations result in mass emissions</p> <p>Equation W-39 Standard Conditions: Equation indicates the resulting volumetric emissions are at actual conditions, though gas volumes are likely tracked at standard conditions, which for industry would correspond to 60 °F and 14.7 psia</p> <p>[COMMENTER] strongly insists that EPA should allow the use of industry standard conditions of 60 °F and 14.7 psia for all Subpart W equations used to quantify and report volumetric emissions for individual sources. This would reduce the potential for error in tracking standard volumes for the regulatory program that differ from those usually tracked for industry operations. If EPA needs the volumetric data at 68 °F for EPA’s purposes, [COMMENTER] requests that reporters should be allowed to make a single final conversion (under §98.233(t)) in which they</p>		

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	would convert volumetric emissions from 60 °F to 68 °F by using the ratio of 527.67/519.67 as the applicable temperature correction. Providing consistency in the application of industry standard conditions for the source-specific calculations will reduce burden, increase consistency, and improve data quality while ultimately once the emissions are converted to a metric tons basis, the mass emissions reported to EPA would be identical.		
2. Clarified 98.232(a) based on changes associated with removing 98.232(j).	<p>Revision: 98.232(a) indicates “You must report CO₂, CH₄, and N₂O emissions from each industry segment specified in paragraph (b) through (i) of this section, CO₂, CH₄, and N₂O emissions from each flare as specified in <i>paragraph (j) of this section</i>, and stationary and portable combustion emissions as applicable as specified in paragraph (k) of this section” (emphasis added).</p> <p>Comment: Paragraph (j) language was deleted and paragraph (j) is now [Reserved]. The reference to paragraph (j) in this section should be deleted. [Flare emissions will be covered in paragraphs (b) through (i).]</p>	At least 1 individual.	Comment Submission
3. Amending the term “sales pipeline” to “flow-line.”	<p>Revision: EPA revised Equation W-10, but not as API had requested in our July 29, 2011 correspondence to EPA.</p> <p>Comment: In an e-mail provided to EPA on July 29, 2011, API provided regulatory revisions to Equation W-10. API proposed to remove the subtraction of the SG term and define the “flow-back volume” term in Equation W-10 by limiting it only to the time span during which gas is actually vented to the atmosphere or flared. The SG_p term should be removed and FRM should be revised to reflect venting to the atmosphere. SG_p is not needed since T is defined as the hours vented. If a well is venting, then it is not recovering to sales.</p> <p>These proposed revisions add clarity, simplify the calculation, and reflect the emissions characteristics of flow-back operations. Without the removal of the SG term, Equation W-10 has the potential to either lead to the calculation of a negative emissions value, or compare emissions values vented to the atmosphere to sales values that are produced against the back-pressure of a gathering or sales pipeline; these are two completely different operating scenarios. API’s</p>	At least 1 individual.	Comment Submission

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	<p>proposed mark-ups to incorporate the changes for 98.233(g) are provided in Section 4 of these comments.</p> <p>EPA has added language defining the number of measurements required based on the number of workovers/completions. API interprets this requirement to apply to the sub-basin. Clarification is needed that the number of measurements required is relative to a sub-basin or basin (facility) and well type combination and not total number of completions/workovers.</p> <p>In addition, API requests the addition of a new equation that sums available measurements and eliminates the need for normalizing and tracking cumulative venting time. Some companies are planning to measure the venting associated with gas well completion and workovers with hydraulic fracturing. Equation W-10 does not allow the use the actual measurements. API has included this new equation in the proposed revisions provided in Section 4 below.</p> <p>Revision: EPA has proposed corrections to Equation W-9.</p> <p>Comment API recognizes that EPA has inadvertently replicated Equation W-8 as Equation W-9 in the August 4, 2011 revisions, but has updated the equation in the September 9, 2011 revisions. API will comment on the September 9 amendment separately.</p> <p>API provides the following corrected version of Equation W-9:</p> $E_{z,n} = \sum_w [V_w \times \{ (0.37 \times 10^{-3}) \times TD_w^2 \times WD_w \times SP_w \} + \sum_{V_w} SFR_w \times (HR_{v,w} - 0.5) \times Z_{v,w}]$ <p>Where:</p> <p>E_{z,n} = Annual natural gas emissions in standard cubic feet/year.</p>		

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	<p> W = Number of wells with well venting for liquids unloading at the facility. $0.37 \times 10^{-3} = \{3.14 (\pi)/4\} / \{14.7 * 144\}$ (psia converted to pounds per square feet). TD_w = Tubing diameter for each well, in inches. WD_w = Tubing depth to plunger bumper for each well, in feet. SP_w = Sales line Surface pressure for each well, in pounds per square inch atmospheric-absolute (psia). $N_v V_w$ = Number of vents per year per well. SFR_w = Average sales flow rate of each gas well in standard cubic feet per hour. $HR_{v,w}$ = Hours that each well was left open to the atmosphere during each unloading event. 0.5 = Hours for average well to blowdown tubing volume at sales line pressure. $Z_{v,w}$ = If $HR_{v,w}$ is less than 0.5 then $Z_{v,w}$ is equal to 0. If $HR_{v,w}$ is greater than or equal to 0.5 then $Z_{v,w}$ is equal to 1. </p> <ul style="list-style-type: none"> ▪ API requests that EPA modify the equation to apply the surface pressure. The use of the sales line pressure has no bearing for wells on compression. Using the sales line pressure in this situation will over-estimate emissions. ▪ EPA uses “pounds per square inch atmosphere”, while the correct terminology is “pounds per square inch absolute” which is gauge pressure + 14.7 psi and is consistent with the pressure adjustment included in the 0.37×10^{-3} constant. ▪ §98.233(f)(3)(i) references §8.233(t) to adjust the natural gas volumetric emissions at standard conditions. This adjustment double corrects the gas volume for pressure, which is already included in the 0.37×10^{-3} constant. API recommends removing the reference to §98.233(t) and defining SFR_w and $E_{a,n}$ in terms of gas volumes at standard conditions (60 °F and 14.7 psia), as shown above. ▪ API requests the use of Methodology 3 for wells without plunger lifts. Methodology 3 specifies that it can be used only for tubing wells with plunger lifts. However, there are 		

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	several instances in the field where one would have tubing wells without plunger lifts. In those instances there is no other methodology provided to calculate emissions.		
4. Clarified the parameter “GHG _i ” in Equation W-1, W-30A, W-30B, and W-31.	<p>Revision: EPA added a time term to equation W-1 to account for the duration the device is operational for the reporting year. T is defined as “Total number of hours in the operating year the devices were operational.”</p> <p>Comment: The term “T” should refer to an estimated average annual time for all the devices or allow the use of 8760 hours. An estimate of the time is consistent with the preamble language stating “EPA is also proposing to amend Equation W-1 to include a parameter ‘T’ that estimates the total number of hours the devices were operational” (emphasis added).</p> <p>Further for this equation, the term “Mass_{s,i}”, does not need the subscript “s”, and the definition does not need “at standard conditions” as mass does not change based on temperature and pressure. [COMMENTER] also requests the term Mass_{s,i} be revised to “mass per type of device” for the different pneumatic device types.</p> <p>The term GHG_i refers to “onshore petroleum and natural gas production facilities” and references paragraph (u)(2)(i), which is defined as “sub-basin”. However, to be consistent with this equation and the methodology for compiling pneumatic device counts, GHG_i should be representative of all the wells in the basin with a particular device type and not aligned with a sub-basin. Revisions to 98.233(u)(2)(i) to address this are provided in comment W.33.</p> <p>(r) Population count and emission factors.</p> <p>GHG_i = For onshore petroleum and natural gas production facilities and onshore natural gas processing facilities, concentration of GHG_i, CH₄ or CO₂, in produced natural gas or feed natural gas; for other facilities listed in § 98.230(a)(4) through (a)(8), GHG_i equals 1 for CH₄ and 1.1 × 10⁻² for CO₂[add: , or use the gas composition allowed in §98.232(m)].</p>	At least 1 individual.	Comment Submission

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<p>5. Clarified the parameter “Mass” in Equation W-1, Equation W-36, W-37, and W-38, and associated parameters for calculating GHG emissions from natural gas pneumatic device venting.</p>	<p>Revision: EPA added a time term to equation W-1 to account for the duration the device is operational for the reporting year. T is defined as “Total number of hours in the operating year the devices were operational.”</p> <p>Comment: The term “T” should refer to an estimated average annual time for all the devices or allow the use of 8760 hours. An estimate of the time is consistent with the preamble language stating “EPA is also proposing to amend Equation W-1 to include a parameter ‘T’ that estimates the total number of hours the devices were operational” (emphasis added).</p> <p>Further for this equation, the term “Mass_{s,i}”, does not need the subscript “s”, and the definition does not need “at standard conditions” as mass does not change based on temperature and pressure. [COMMENTER] also requests the term Mass_{s,i} be revised to “mass per type of device” for the different pneumatic device types.</p> <p>The term GHG_i refers to “onshore petroleum and natural gas production facilities” and references paragraph (u)(2)(i), which is defined as “sub-basin”. However, to be consistent with this equation and the methodology for compiling pneumatic device counts, GHG_i should be representative of all the wells in the basin with a particular device type and not aligned with a sub-basin. Revisions to 98.233(u)(2)(i) to address this are provided in comment W.33.</p>	<p>At least 2 individual.</p>	<p>Comment Submission</p>

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	<p>Pneumatic controller operating hours: The Proposed Rule adds annual operating hours as a parameter in Equation W-1. Operators should be allowed to assume 8760 operating hours, with actual hours used at the operator's discretion.</p> <p>Equation W-1 in §98.233(a) calculates emissions from pneumatic controllers. The Proposed Rule revises the equation to add a new parameter "T", which is defined as, "The total number of hours in the operating year that the devices were operational." Previously, Equation W-1 assumed continuous operation for the entire year – i.e., 8760 annual operating hours. In addition to substituting "controllers" for "devices" per the previous comment, [COMMENTER] strongly recommends that Subpart W clearly indicate that 8760 hours can be assumed as a default value for "T". The proposed revision will have a minimal impact on inventory estimate accuracy, and in many cases operators have already set up reporting programs based on the 8760 operating hour assumption. EPA should not add unnecessary costs and complications by mandating that annual operating hours is defined for pneumatic controllers. [COMMENTER] recommends that Subpart W include the following revisions for the description of "T" in the list of variable that follows Equation W-1:</p> <p>"T = Total number of annual operating hours for in the operating year the controllers devices were operational. 8760 annual operating hours can be used as a default assumption."</p>		
<p>6. Clarifying the parameter T in Equation W-2 and associated parameters.</p>	<p>Revision: EPA added a time term to equation W-2 to account for the duration the pneumatic pump is operational for the reporting year.</p> <p>Comment: The terms defined for Equation W-2 include “24 * 365 = Conversion to yearly emissions estimate”. This term is no longer used in the equation and should be deleted from the list of terms.</p> <p>The term “T” should refer to an estimated average annual time for all the pumps or allow the use of 8760 hours. An estimate of the time is consistent with the preamble language stating “We are proposing to amend Equation W–2 in 40 CFR 98.233(c), which is used for calculating GHG</p>	<p>At least 1 individual.</p>	<p>Comment Submission</p>

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Technical Issue	Questions Submitted to EPA	Type and approximate number of submittals	Reference
	<p>emissions from natural gas pneumatic pump venting, to include a parameter “T” that estimates the total amount of hours the pumps were operational” (emphasis added).</p> <p>Further for this equation, the term “Mass_{s,i}”, does not need the subscript “s”, and the definition does not need “at standard conditions” as mass does not change based on temperature and pressure.</p> <p>The term GHG_i refers to “onshore petroleum and natural gas production facilities” and references paragraph (u)(2)(i), which is defined as “sub-basin”. However, to be consistent with this equation, GHG_i should be representative of all the wells in the basin with a pneumatic pump and not aligned with a sub-basin. Revisions to 98.233(u)(2)(i) to address this are provided in comment W.33</p>		
<p>7. Modified paragraph 98.233(d) (1) to allow the use of manufacturer’s instruction or industry standard practice for CEMS on AGRs.</p>	<p>(1) Calculation Methodology 1. If you operate and maintain a CEMS <u>on an AGR exhaust stack</u> that has both a CO2 concentration monitor and volumetric flow rate monitor, you must calculate CO2 emissions under this subpart by following the Tier 4 Calculation Methodology and all associated calculation, quality assurance, reporting, and recordkeeping requirements for Tier 4 in subpart C of this part (General Stationary Fuel Combustion Sources). <u>For existing continuous monitoring equipment on AGR vents, and for continuous monitoring equipment on non-combustion AGR vents, the calculation, quality assurance, reporting, and recordkeeping requirements of 98.33(a)(4) and 98.34(c) may alternatively be satisfied by following the calculation, quality assurance, reporting, and recordkeeping requirements in a permit or the recommendations of the manufacturer of the monitoring equipment or general industry practice.</u> If a CO2 concentration monitor and volumetric flow rate monitor are not available, you may elect to install a CO2 concentration monitor and volumetric flow rate monitor that comply with all of the requirements specified for the Tier 4 Calculation Methodology in subpart C of this part (General Stationary Fuel Combustion). The calculation and reporting of CH4 and N2O emissions is not required as part of the Tier 4 requirements for AGRs.”</p>	<p>At least 1 individual.</p>	<p>Comment Submission</p>

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<p>8. Added Equations W-4A and W-4B for calculating emissions from an AGR using inlet and outlet gas compositions and flow rates.</p>	<p>Revision: EPA has modified Equation W-4 for calculating CO₂ emissions from acid gas removal units. EPA notes in the preamble that the correction was needed because the original equation introduces an error that increases significantly when the amount of CO₂ in the gas increases.</p> <p>Comment: The previous (original) equation contained a variable, alpha, to adjust the calculation based on whether the inlet gas or outlet gas flow rate was applied. Note, the definition of terms still lists the term alpha, although alpha is not used in the revised equation.</p> <p>The proposed correction seems to introduce a larger error than the original equation if the inlet gas volume is applied. Testing the equations using the onshore production example facility from the Compendium (Section 8.1.1), results in the following:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tbody> <tr> <td>Compendium Method</td> <td>1,190 scf CO₂/yr</td> </tr> <tr> <td>Original EPA Method: Applying inlet gas flow</td> <td>1,183 scf CO₂/yr</td> </tr> <tr> <td>Original EPA Method: Applying outlet gas flow</td> <td>1,154 scf CO₂/yr</td> </tr> <tr> <td>Revised EPA Method: Applying inlet gas flow</td> <td>1,337 scf CO₂/yr</td> </tr> <tr> <td>Revised EPA Method: Applying outlet gas flow</td> <td>1,169 scf CO₂/yr</td> </tr> </tbody> </table> <p>[The Compendium example is based on the following conditions: AGR inlet gas flow = 10,290 scf/yr, inlet gas CO₂ composition is 12%, AGR outlet gas flow rate = 8,997 scf/yr, outlet gas CO₂ composition is 0.5%.]</p>	Compendium Method	1,190 scf CO ₂ /yr	Original EPA Method: Applying inlet gas flow	1,183 scf CO ₂ /yr	Original EPA Method: Applying outlet gas flow	1,154 scf CO ₂ /yr	Revised EPA Method: Applying inlet gas flow	1,337 scf CO ₂ /yr	Revised EPA Method: Applying outlet gas flow	1,169 scf CO ₂ /yr	<p>At least 1 individual.</p>	<p>Comment Submission</p>
Compendium Method	1,190 scf CO ₂ /yr												
Original EPA Method: Applying inlet gas flow	1,183 scf CO ₂ /yr												
Original EPA Method: Applying outlet gas flow	1,154 scf CO ₂ /yr												
Revised EPA Method: Applying inlet gas flow	1,337 scf CO ₂ /yr												
Revised EPA Method: Applying outlet gas flow	1,169 scf CO ₂ /yr												

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	<p>When the inlet volume of gas is used, the proposed corrected equation over estimates emissions by incorrectly increasing the volume of inlet gas. Based on [COMMENTER]'s analysis, it does not appear that the revision improves the quality of data when the inlet gas flow rate is applied.</p> <p>[COMMENTER] requests that EPA retain the previous equation, using the alpha term. As demonstrated in the table above, the revised equation actually introduces a larger error, particularly when the inlet gas flow rate is applied.</p> <p>[COMMENTER] also requests that the flow rate term "V" be defined in terms of standard conditions (60°F and 14.7 psia), consistent with the flow measurements available for amine units. In addition, the term E_{a,CO_2} should be revised to E_{s, CO_2} and be expressed in volumetric emissions at standard conditions (60°F and 14.7 psia). With this revision, paragraph (9) is no longer needed.</p>		
9. Clarified the parameter '1000' in Equation W-5.	<p>Revision: EPA added a definition for the "1000" term used in Equation W-5.</p> <p>Comment: [COMMENTER] requests the following revision to this definition: "1000 = Conversion of EF_i in thousand standard cubic feet to <u>standard</u> cubic feet."</p>	At least 1 individual.	Comment Submission
10. Clarified paragraph 98.233 (e)(5) that emissions are determined for all refilling processes that occur during the calendar year.	<p>Comment: EPA has not proposed revisions to Equation W-6. However, [COMMENTER] notes the following technical corrections for this equation:</p> <ul style="list-style-type: none"> • §98.233(e)(5) indicates that Equation W-6 is to be used every time the dehydrator it is depressurized for the desiccant refilling process. As a result, the parameter T and the multiplier of 365 days/yr should be removed from the equation. • If $E_{s,n}$ is an annual number, the equation should include a Σ of depressurizations for refilling. 	At least 1 individual.	Comment Submission

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<p>11. Modified parameters under Equation W-8</p>	<p>Revision: EPA has modified the summation terms in Equation W-8 to account for the pressure and tubing diameter groupings.</p> <p>Comments:</p> <ul style="list-style-type: none"> • [COMMENTER] appreciates that EPA has corrected $E_{s,n}$ and SFR_q to be stated in standard conditions, not actual conditions. • For clarity, the term CD_p in Equation W-8 should indicate that this is the internal diameter, which is consistent with the calculation approach. • On page 54 of Appendix D in the Technical Support Document associated with these proposed amendment, EPA indicates that the pressure in Equation W-8 is the reservoir shut-in pressure. EPA comments that this information is not reliably available in public literature. [COMMENTER] agrees with this assessment, but further would like to point out that reservoir shut-in pressure is not reliably available in operations either. The term SP_p should represent the surface pressure prior to venting, in pounds per square inch absolute (not atmosphere). • In the list of defined terms for Equation W-8, the term $HR_{Q,PW}$ should be $HR_{q,p}$. • EPA has clarified that the term WD_p is the distance between the lowest packer to the bottom of the well. It is unclear what value should be applied for WD_p for wells without packers. • The amendments did not change 98.233(f)(2)(i) which references 98.233(t) to adjust the natural gas volumetric emissions at standard conditions. This adjustment double corrects the gas volume for pressure, which is already included in the 0.37×10^{-3} constant. [COMMENTER] recommends removing the reference to §98.233(t) since SFR_q and $E_{s,n}$ are defined in terms of gas volumes at standard conditions (60 °F and 14.7 psia). 	<p>At least 1 individual.</p>	<p>Comment Submission</p>

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	<p>Equation W-8 should be replaced with the following:</p> $E_{s,n} = \sum_w [V_w \times \{ (0.37 \times 10^{-3}) \times CD_w^2 \times WD_w \times SP_w \}] + \sum_{V_w} SFR_w \times (HR_{v,w} - 1.0) \times Z_{v,w}]$ <p>Where:</p> <p>$E_{s,n}$ = Annual natural gas emissions at actual conditions in standard cubic feet/year. W = Number of wells with well venting for liquids unloading at the facility. $0.37 \times 10^{-3} = \{ 3.14 (\pi) / 4 \} / \{ 14.7 * 144 \}$ (psia converted to pounds per square feet). CD_w = Casing diameter for each well, in inches. WD_w = Well depth to first producing horizon for each well, in feet. SP_w = Shut in Surface pressure prior to venting for each well, in pounds square inch atmosphere absolute (psia). V_w = Number of vents per year per well. (Note, the second summation was changed from V to V_w in the revised equation above to reflect this term.) SFR_w = Average sales flow rate of each gas well in cubic feet per hour. $HR_{v,w}$ = Hours that each well was left open to the atmosphere during each unloading event. 1.0 = Hours for average well to blowdown casing volume at shut-in pressure. $Z_{v,w}$ = If $HR_{v,w}$ is less than 1.0 then $Z_{v,w}$ is equal to 0. If $HR_{v,w}$ is greater than or equal to 1.0 then $Z_{v,w}$ is equal to 1.</p> <ul style="list-style-type: none"> ▪ In the equation above, [COMMENTER] requests that the SP_p term represent surface pressure prior to venting, in pounds per square inch absolute. As EPA had defined SP_p, the shut-in pressure is interpreted to refer to the bottom-hole or casing pressure, which is not readily available. 		

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	<ul style="list-style-type: none"> ▪ EPA uses “pounds per square inch atmosphere”, while the correct terminology is “pounds per square inch absolute” which is gauge pressure + 14.7 psi and is consistent with the pressure adjustment included in the 0.37×10^{-3} constant. ▪ §98.233(f)(2)(i) references §98.233(t) to adjust the natural gas volumetric emissions at standard conditions. This adjustment double corrects the gas volume for pressure, which is already included in the 0.37×10^{-3} constant. [COMMENTER] notes that the August 19 amendments remove the reference to §98.233(t) and define SFRW in terms of gas volumes at standard conditions (60 °F and 14.7 psia). As indicated above, the term $E_{a,n}$ should also be defined in terms of gas volumes at standard conditions (60 °F and 14.7 psia). 		
<p>12. Modified parameters under Equation W-9 and removed reference to paragraph 98.236(t).</p>	<p>Revision: EPA revised Equation W-9.</p> <p>Comments:</p> <ul style="list-style-type: none"> • [COMMENTER] appreciates that EPA has corrected $E_{s,n}$ and SFR_q to be stated in standard conditions, not actual conditions. • For clarity, the term TD_p in Equation W-9 should indicate that this is the internal diameter, which is consistent with the calculation approach. • The term SP_p should be the flowing wellhead pressure, not the sales line pressure which has no bearing for wells on compression. Using the sales line pressure in this situation will over-estimate emissions. SP_p should also be expressed as pounds per square inch absolute, (not atmosphere) which is gauge pressure + 14.7 psi and is consistent with the pressure adjustment included in the 0.37×10^{-3} constant. • The amendments did not change 98.233(f)(3)(i) which references §8.233(t) to adjust the natural gas volumetric emissions at standard conditions. This adjustment double corrects the gas volume for pressure, which is already included in the 0.37×10^{-3} constant. [COMMENTER] recommends removing the reference to §98.233(t) since SFR_q and $E_{s,n}$ are defined in terms of gas volumes at standard conditions (60 °F and 14.7 psia). 	<p>At least 1 individual.</p>	<p>Comment Submission</p>

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	<ul style="list-style-type: none"> [COMMENTS] requests the use of Methodology 3 for wells without plunger lifts. <p>Revision: EPA has proposed corrections to Equation W-9.</p> <p>Comment [COMMENTS] recognizes that EPA has inadvertently replicated Equation W-8 as Equation W-9 in the August 4, 2011 revisions, but has updated the equation in the September 9, 2011 revisions. [COMMENTS] will comment on the September 9 amendment separately.</p> <p>[COMMENTS] provides the following corrected version of Equation W-9:</p> $E_{z,n} = \sum_w [V_w \times \{ (0.37 \times 10^{-3}) \times TD_w^2 \times WD_w \times SP_w \} + \sum_{V_w} SFR_w \times (HR_{v,w} - 0.5) \times Z_{v,w}]$ <p>Where:</p> <p>E_{sa,n} = Annual natural gas emissions in standard cubic feet/year.</p> <p>W = Number of wells with well venting for liquids unloading at the facility.</p> <p>0.37×10⁻³ = {3.14 (pi)/4}/{14.7*144} (psia converted to pounds per square feet).</p> <p>TD_w = Tubing diameter for each well, in inches.</p> <p>WD_w = Tubing depth to plunger bumper for each well, in feet.</p> <p>SP_w = Sales line Surface pressure for each well, in pounds per square inch atmospheric-absolute (psia).</p> <p>N_v V_w = Number of vents per year per well.</p> <p>SFR_w = Average sales flow rate of each gas well in standard cubic feet per hour.</p> <p>HR_{v,w} = Hours that each well was left open to the atmosphere during each unloading event.</p> <p>0.5 = Hours for average well to blowdown tubing volume at sales line pressure.</p> <p>Z_{v,w} = If HR_{v,w} is less than 0.5 then Z_{v,w} is equal to 0. If HR_{v,w} is greater than or</p>		

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	<p>equal to 0.5 then $Z_{v,w}$ is equal to 1.</p> <ul style="list-style-type: none"> ▪ [COMMENTER] requests that EPA modify the equation to apply the surface pressure. The use of the sales line pressure has no bearing for wells on compression. Using the sales line pressure in this situation will over-estimate emissions. ▪ EPA uses “pounds per square inch atmosphere”, while the correct terminology is “pounds per square inch absolute” which is gauge pressure + 14.7 psi and is consistent with the pressure adjustment included in the 0.37×10^{-3} constant. ▪ §98.233(f)(3)(i) references §8.233(t) to adjust the natural gas volumetric emissions at standard conditions. This adjustment double corrects the gas volume for pressure, which is already included in the 0.37×10^{-3} constant. [COMMENTER] recommends removing the reference to §98.233(t) and defining SFR_w and $E_{a,n}$ in terms of gas volumes at standard conditions (60 °F and 14.7 psia), as shown above. ▪ [COMMENTER] requests the use of Methodology 3 for wells without plunger lifts. Methodology 3 specifies that it can be used only for tubing wells with plunger lifts. However, there are several instances in the field where one would have tubing wells without plunger lifts. In those instances there is no other methodology provided to calculate emissions. 		
<p>13. Added Equation W-10B, supporting parameters, and text to 98.233(g).</p>	<p>Revision: EPA revised Equation W-10, but not as [COMMENTER] had requested in our July 29, 2011 correspondence to EPA.</p> <p>Comment: In an e-mail provided to EPA on July 29, 2011, [COMMENTER] provided regulatory revisions to Equation W-10. [COMMENTER] proposed to remove the subtraction of the SG term and define the “flow-back volume” term in Equation W-10 by limiting it only to the time span</p>	<p>At least 1 individual.</p>	<p>Comment Submission</p>

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	<p>during which gas is actually vented to the atmosphere or flared. The SG_p term should be removed and FRM should be revised to reflect venting to the atmosphere. SG_p is not needed since T is defined as the hours vented. If a well is venting, then it is not recovering to sales.</p> <p>These proposed revisions add clarity, simplify the calculation, and reflect the emissions characteristics of flow-back operations. Without the removal of the SG term, Equation W-10 has the potential to either lead to the calculation of a negative emissions value, or compare emissions values vented to the atmosphere to sales values that are produced against the back-pressure of a gathering or sales pipeline; these are two completely different operating scenarios. [COMMENTER]'s proposed mark-ups to incorporate the changes for 98.233(g) are provided in Section 4 of these comments.</p> <p>EPA has added language defining the number of measurements required based on the number of workovers/completions. [COMMENTER] interprets this requirement to apply to the sub-basin. Clarification is needed that the number of measurements required is relative to a sub-basin or basin (facility) and well type combination and not total number of completions/workovers.</p> <p>In addition, [COMMENTER] requests the addition of a new equation that sums available measurements and eliminates the need for normalizing and tracking cumulative venting time. Some companies are planning to measure the venting associated with gas well completion and workovers with hydraulic fracturing. Equation W-10 does not allow the use the actual measurements. [COMMENTER] has included this new equation in the proposed revisions provided in Section 4 below.</p>		
14. Clarified in 98.233(g)(1) that the number of measurements or calculations required	<p>Revision: EPA revised Equation W-10, but not as [COMMENTER] had requested in our July 29, 2011 correspondence to EPA.</p> <p>Comment: In an e-mail provided to EPA on July 29, 2011, [COMMENTER] provided regulatory revisions to Equation W-10. [COMMENTER] proposed to remove the subtraction of the SG term</p>	At least 1 individual.	Comment Submission

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<p>are dependent on the number workover or completions done in a sub-basin category.</p>	<p>and define the “flow-back volume” term in Equation W-10 by limiting it only to the time span during which gas is actually vented to the atmosphere or flared. The SG_p term should be removed and FRM should be revised to reflect venting to the atmosphere. SG_p is not needed since T is defined as the hours vented. If a well is venting, then it is not recovering to sales.</p> <p>These proposed revisions add clarity, simplify the calculation, and reflect the emissions characteristics of flow-back operations. Without the removal of the SG term, Equation W-10 has the potential to either lead to the calculation of a negative emissions value, or compare emissions values vented to the atmosphere to sales values that are produced against the back-pressure of a gathering or sales pipeline; these are two completely different operating scenarios. [COMMENTER]’s proposed mark-ups to incorporate the changes for 98.233(g) are provided in Section 4 of these comments.</p> <p>EPA has added language defining the number of measurements required based on the number of workovers/completions. [COMMENTER] interprets this requirement to apply to the sub-basin. Clarification is needed that the number of measurements required is relative to a sub-basin or basin (facility) and well type combination and not total number of completions/workovers.</p> <p>In addition, [COMMENTER] requests the addition of a new equation that sums available measurements and eliminates the need for normalizing and tracking cumulative venting time. Some companies are planning to measure the venting associated with gas well completion and workovers with hydraulic fracturing. Equation W-10 does not allow the use the actual measurements. [COMMENTER] has included this new equation in the proposed revisions provided in Section 4 below.</p>		
<p>15. Equation W-11C is used to determine whether the backflow during workovers and</p>	<p>Revision: EPA has added Equation W-11C to determine whether the flow rate is sonic or subsonic. Flow is sonic if the value of R is greater than 2.</p>	<p>At least 1 individual.</p>	<p>Comment Submission</p>

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<p>completions is predominantly sonic or subsonic.</p>	<p>Comment: [COMMENTER] appreciates the clarity provided by documenting the equation determining if the flow rate is sonic or sub-sonic. However, Methodology 2 does not acknowledge that a single completion or workover can alternate between sonic and sub-sonic flows. As [COMMENTER] pointed out in a letter to EPA on May 13, 2011, flowback on any single completion will be partially supersonic and partially subsonic. Reporters cannot discern exactly when flowback falls into either category during a completion. Additionally, liquids and gases flow at different rates. As a completion progresses, the amount of liquids decreases and the amount of gases increases, which makes performing the calculations more difficult. EPA should replace this methodology with a single calculation for tracking pressure drop across the choke, with assumptions for choke flow and gas gravity. Such a calculation will be technically feasible and sufficient for policy purposes.</p>		
<p>16. Clarified Equation W-13 by changing the parameter “V_f” and “T_f” to “V_p” and “T_p”.</p>	<p>Revision: EPA has addressed gas volumes at standard conditions and the sub-basin category approach in revisions to the definition of terms for Equation W-13.</p> <p>Comment: EPA has changed V_f and T_f to V_p and T_p, respectively in the definitions, but did not change the variable subscripts in the equation. Also, the term “V_v” is defined in terms of each blowdown “i”. However, the subscript “i” is not used in either Equation W-14A or W-14B. [COMMENTER] believes “i” should be replaced with “p”.</p>	<p>At least 1 individual.</p>	<p>Comment Submission</p>
<p>17. Clarified the parameter definition of “N_{wo}”.</p>	<p>Revision: Under §98.236(c)(6)(ii)(B), EPA clarified that the total count of workovers in the calendar year should be reported for those that flare gas or vent to the atmosphere.</p> <p>Comment: [COMMENTER] supports this revision. However, [COMMENTER] requests similar clarification be added to the definition of the term “N” in Equation W-13 to reflect that the number of workovers in the equation reflect those that flare gas or vent gas to the atmosphere.</p>	<p>At least 1 individual.</p>	<p>Comment Submission</p>
<p>18. Clarified paragraph 98.233(i)(1) as to whether emergency</p>	<p>EPA should clarify that emergency events are excluded from blowdown vent stack reporting. Revisions in the Proposed Rule conflict with the August 4 proposed revisions. Additional revisions are needed to clarify Subpart W requirements.</p>	<p>At least 1 individual.</p>	<p>Comment Submission</p>

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<p>blowdown events are included.</p>	<p>As indicated in September 19, 2011 comments to EPA, [COMMENTER] supports the August 4 proposed revision that excludes emergency events from the definition of "blowdown vent stack ". However, the Proposed Rule confuses this issue in revisions to the introductory text of §98.233(i). The Proposed Rule should be revised to clearly indicate that emergency events are excluded from blowdown vent stack reporting.</p> <p>The August 4 proposed rule revisions [76 FR 47392] revised the definition of blowdown vent stack:</p> <p><i>"Blowdown vent stack emissions mean natural gas and/or CO2 released due to maintenance and/or blowdown operations including compressor blowdown and emergency shut-down (ESD) system testing. Emissions from emergency events are not included."</i></p> <p>The new closing sentence clearly indicates that emergency venting is excluded from blowdown vent stack reporting. [COMMENTER] supports this revision. However, the Proposed Rule introduction to §98.233(i) confuses issue. Revised text from EPA's redline version of the rule available in the docket is shown here, but the last sentence is <i>not</i> included in the published Proposed Rule:</p> <p><i>"Calculate CO2 and CH4 blowdown vent stack emissions from depressurizing equipment to reduce system pressure for planned or emergency shutdowns or to take equipment out of service for maintenance the atmosphere (excluding depressurizing to a flare, over-pressure relief, operating pressure control venting and blowdown of non-GHG gases; desiccant dehydrator blowdown venting before reloading is covered in paragraph (e)(5) of this section) as follows (Emissions from emergency vents are not included.):"</i></p> <p>In this revised text, the text "or emergency" contradicts the revised §98.6 definition of blowdown vent stack and the text in the closing sentence of the EPA redline version. Both of these exclude</p>		

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	<p>emergency events and indicate EPA intended to exclude the reporting of emergency venting emissions. To clarify and avoid conflict with the §98.6 definition, the phrase “or emergency” should be deleted. [COMMENTER] also recommends including the closing sentence with the other list of excluded activities and referring to emergency <i>events</i> rather than emergency <i>vents</i>. The [COMMENTER] recommended revisions based on the EPA redlines above follows:</p> <p>"Calculate CO2 and CH4 blowdown vent stack emissions from depressurizing equipment to reduce system pressure for planned or emergency shutdowns or to take equipment out of service for maintenance the atmosphere (excluding depressurizing to a flare, over-pressure relief, operating pressure control venting and blowdown of non-GHG gases, and emissions from emergency events; desiccant dehydrator blowdown venting before reloading is covered in paragraph (e)(5) of this section) as follows (Emissions from emergency vents are not included):"</p>		
<p>19. Clarified parameters in Equation W-14A and W-14B.</p>	<p>Revision: The preamble (page 56020) indicates that EPA is providing reporters the option of tracking blowdowns by each occurrence for the same blowdown volume: “To enable facilities to retain their current tracking system, we are proposing <u>to add an option</u> for calculating emission by equipment type” (emphasis added). However, the regulatory language does not provide an option, but rather blends the two approaches. 98.233(i)(3) requires calculating the total emissions for each <u>equipment type</u> using either Equation W-14A or W-14B. While, the term “N” used in these equations is defined as the number of repetitive blowdowns for each unique volume in the calendar year.</p> <p>Comment: [COMMENTER] suggests that EPA revise the definition of term “N” to present the option of using unique volume or equipment: “N= number of repetitive blowdowns for each unique <u>volume or equipment type</u> in calendar year.”</p> <p>EPA should similarly revise the text under 98.233(i)(3): “Calculate the total annual venting emissions for each <u>unique volume or equipment type</u> ...”.</p>	<p>At least 1 individual.</p>	<p>Comment Submission</p>

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	[COMMENTER] also requests that EPA delete the words “and mass” under 98.233(i)(5). This correction is consistent with the calculation approach for blowdown vent stacks which result in volumetric emissions, not mass.		
20. Removed paragraph 98.233(i)(5).	<p>Revision: EPA revised 98.233(i)(5) to reference emissions determined under Equations W-14A and W-14B.</p> <p>Comment: 98.233(i)(5) requires calculating the total annual venting emissions for all blowdown vent stacks “by adding all standard volumetric and mass emissions determined using Equations W-14A and W-14B.” [COMMENTER] requests the phrase “and mass” be deleted from this statement as neither Equations W-14A nor B result in mass emissions. Paragraph (5) should be placed before paragraph (4), which references 98.233(v) for the conversion of volumetric emissions to mass emissions.</p>	At least 1 individual.	Comment Submission
21. Revised Equation W-16.	<p>Revision: In Equation W-16, EPA added a correction to the first part of the equation to convert the time aspect of the emission factor from an annual basis to an hourly basis.</p> <p>Comment: The proposed revisions did not correct the units in the second part of the equation. The correct equation should be:</p> $E_{s,i} = \left(CF_n \times \frac{E_n \left(\frac{scf}{yr} \right)}{8760 \left(\frac{hr}{yr} \right)} \times T_n (hrs) \right) + \left(\frac{E_n \left(\frac{scf}{yr} \right)}{8760 \left(\frac{hr}{yr} \right)} \times (8760 hrs - T_n (hrs)) \right)$	At least 1 individual.	Comment Submission
22. Modified paragraph 98.233(l) regarding emissions from well testing venting and	<p>G. Well testing venting and flaring On page 56031 of the September 9, 2011 preamble, EPA is addressing well testing and venting and flaring. Among other things, EPA is considering, but has not yet proposed, using the production rate to estimate the volume of emissions from venting and testing gas wells that</p>	At least 1 individual.	Comment Submission

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flaring.	<p>produce dry gas. EPA is soliciting comments on this suggested provision for gas wells.</p> <p><u>Commenter Response:</u> Commenter agrees that production rate could be used as an estimate of gas flow rate.</p>		
23. Amended Equation W-18 to report emissions at a facility level.	<p>Revision: For associated gas venting and flaring, EPA has replaced field with sub-basin category for determining the separator oil composition and Reid vapor pressure.</p> <p>Comment: [COMMENTER] supports the revision for sub-basin. However, sub-basin here should apply to oil wells based on the “oil formation” sub-basin category proposed by [COMMENTER] above. In addition, [COMMENTER] interprets “associated gas” to mean natural gas produced with crude oil that is not recovered for sales due to the lack of infrastructure. This is consistent with a response EPA posted to the list of Frequently Asked Questions on Subpart W, which indicated “Section 98.233(m) only covers natural gas that is not recovered from the production operation.”</p> <p>With the introduction of the sub-basin concept, it is now unclear what the geographic boundaries are for the volume term used in Equation W-18. The objective of the sub-basin approach is to reduce sampling burden. [COMMENTER] requests that EPA clarify that the volume used in Equation W-18, and the resulting emissions from Equation W-18, represent the oil formation at the entire basin level. Paragraph (1) should be modified to state “If GOR from each well is not available, the GOR from a cluster of wells in the [add (red): basin] shall be used.” With these changes, the terms in Equation W-18 will be consistent with the reporting requirements under 98.236(c)(11)(iii) and (iv).</p>	At least 1 individual.	Comment Submission
24. Added Equation W-30B, amended Equation W-32, amended text in 98.233(q) and (r) to	<p>Metering-Regulating Station Sampling</p> <p>The Final Rule requires that leak surveys be conducted at all metering-regulating (M&R) stations classified as "custody transfer city gate stations." We agree that this definition has problems, because it attempts to capture ownership change (custody transfer) and pressure change (city</p>	At least 3 individual.	Comment Submission

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<p>allow reporters to conduct leak detection at T-D transfer stations over a five year period.</p>	<p>gate) within the same definition. Those two classes of stations do not necessarily overlap.</p> <p>The Proposed Rule discards those qualifying terms and instead requires surveys at all transmission distribution stations. While this definition is perhaps more clear, the number of stations that must be surveyed is greatly increased, thus putting an undue burden on LDCs. We respectfully disagree with the EPA's statement that "the proposed revisions primarily provide additional clarifications or flexibility regarding the existing regulatory requirements, [and] generally do not affect the type of information that must be collected" For example, under the Final Rule, PSNC would be required to leak survey 18 M&R stations in its entire system. This is the number of "custody transfer" M&R stations within the PSNC system. Under the Proposed Rule, the number of transmission-distribution stations that must be surveyed increases to more than 450. Our SCE&G subsidiary would experience a similarly impossible number to survey in 2011. A survey of this magnitude cannot possibly be conducted with but a few months remaining in the year.</p> <p>Furthermore, we believe that a survey of this size will not yield significantly better information than a smaller survey. If it is EPA's goal to have a statistically sound number of M&R stations surveyed, then it is appropriate to use other factors to reduce the number of stations surveyed. We suggest two possible ways to limit the surveyed subset of stations:</p> <ol style="list-style-type: none"> 1. Survey only those stations that flow a significant amount of gas at any point during the year. This flow range could be based on actual gas measurements or determined by flow models based on actual system conditions. This method is attractive because it would remove from the subset all M&R stations that serve only handfuls of customers. For example, if only stations that had modeled flows of 200 cubic feet per hour (cfh) or more were included in the PSNC survey, the surveyed subset would be cut to 68 stations from 450 stations. 2. Survey a defined percentage of M&R stations. For example, 10% of all M&R stations might be included in the survey, perhaps subject to a minimum and maximum number of stations. This 		

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	<p>method might be attractive because the 10% of surveyed stations could include stations of all sizes and types, thus creating a more representative emission factor to apply to the whole universe of stations.</p> <p>We suggest that the inlet pressure to the M&R station not be used as a threshold for subset selection. A large number of PSNC's and SCE&G's M&R stations serve a small number of customers -as few as three per station. Some of those small stations have inlet pressures as high as 800 psi and would be included any subset based on inlet pressure.</p> <p>Under the Proposal, EPA is replacing the term "custody transfer city gate station" with the term "Transmission-distribution (TD) transfer station". This replacement will sweep in many more stations into the resource-intensive on site leak survey requirement than appear to be covered under the current rule. Survey data from larger stations should be sufficient to develop an emission factor that can be applied to smaller stations. We urge EPA to impose the leak survey requirement only on TD Stations with a design rate of 4 million standard cubic feet per hour (scf/hr). This level will focus the leak surveys on a manageable number of stations.</p> <p>I. New Definition of Stations Subject to Annual Leak Surveys: BAMB Essential to Deal with Retroactive Application to 2011</p> <p>While [COMMENTER] appreciates EPA's effort to provide clear definitions of what is or is not subject to the annual component leak surveys, we are very concerned about the dramatic shift in the type and number of stations that would be subject to the annual leak survey requirement under the Proposal. We are further concerned that these new requirements would apply retroactively to the beginning of 2011, even though the Technical Revisions are not expected to be issued in final form until December 2011. Obviously, natural gas local distribution companies (LDCs) have had to make their best guess this year regarding which stations they should leak survey under the existing Subpart W rule, and in December 2011 they will not be able to turn the clock back to January 2011 and re-do their Subpart W leak survey program. We understand that the agency is suggesting that LDCs will be allowed to deal with this dilemma by submitting the leak surveys</p>		

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	<p>they have conducted and/or apply an emission factor to a count of stations under the Best Available Monitoring Methods (BAMM) provisions. See 76 Fed. Reg. at 56,032. It will be important to make this clear in the final rule and preamble.</p>		
<p>25. Clarified definitions for parameters applicable to Equation W-30A and Equation W-30B.</p>	<p>Equation W-30: As [COMMENTER] and others have requested, EPA has proposed to clarify the summation operator in Equation W-30 to make it mathematically correct, and we appreciate this correction. 76 Fed. Reg. at 56,032. The agency has also proposed several revisions to use the new terms “transmission-distribution transfer stations” and “metering-regulating stations.” [COMMENTER] supports these revisions. However, Equation W-30 is still confusing and requires additional revisions.</p> <p>First, there appears to be a conflicting provisions in the definition of T_p in W-30. The last two sentences are confusing. We suggest revising the text to say:</p> <p>“If multiple leak detection surveys are conducted at a facility or TD station, assume that the component found to be leaking has been leaking since the previous survey (<u>if not found in the previous survey</u>) or the beginning of the entire calendar year (<u>if it was found in the previous survey</u>). For the last leak detection survey in the calendar year, assume that all leaking components continue to leak until the end of the calendar year.”</p> <p>Second, a typographical error appears in the proposed revision to Equation W-30, where the subscript “s” was omitted from EF. The definition for EF was not amended in the proposed rule, so the definition for EF is found in the November 2010 final rule version of Equation W-30 – where the term is listed as EFs. This should be corrected to avoid confusion.</p> <p>Third, Equation W-30 is also confusing because the definition of $E_{s,i}$ in Equation W-30 is different from the definition for $E_{s,i}$ in W-32 even though they represent the same thing. To make it less confusing, the definition of $E_{s,i}$ in Equation W-30 should be changed to match the definition in Equation W-32 which says “Annual volumetric GHG i emissions, CO2 or CH4 at standard conditions from all equipment leak sources at all above grade T-D transfer stations”.</p>	<p>At least 3 individuals.</p>	<p>Comment Submission</p>

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	<p>Section 98.232(i): The proposed amendments to 98.232(i) would change the numbering of the distribution emission sources and inadvertently omit pipeline main equipment leaks from 98.232(i). In the November 2010 final rule, section 98.232.(i)(4) listed “pipeline main equipment leaks”. In the September 2011 Proposal, EPA proposes to revise section 98.232(i)(4) to include “equipment leaks from vaults at below grade metering-regulating stations” but the agency proposes no further edits to the list. There are no proposed revisions to the first paragraph in section 98.233(r), which references section 98.232(i). As a result, the list in 98.233(r) will need to be revised to reflect these proposed changes.</p>		
	<p><i>Leak Detection and Leaker Emission Factors</i></p> <p>Although EPA has proposed revisions to Equation W-30 in 98.233.q, [COMMENTER] still feels it is difficult to determine what is being calculated in W-30. Is equation W-30, the sum of emissions from each component type (ie $E_{s,i}$ is emissions from just connectors) from all stations? Or is it the sum of emissions from all components (ie the sum of emissions from connectors, block valves, control valves, pressure relief valves, orifice meters, regulators AND open-ended lines) from all transmission-distribution stations? It is confusing because of the use of the terms component and equipment leak source. Component is defined in the rule, but equipment leak source is not. EPA seems to be using these terms interchangeably and they seem to mean the same thing. For example, the term component is used both in T_p and in equation W-31 definition of Counts whereas equipment leak source is used in the definition of x and $E_{s,i}$ in equation W-30. In addition, although EPA amended the definition of x in equation W-30, it is still confusing. The definition of x in Equation W-30 should more closely match the language for $E_{s,i}$ in equation W-32. Some confusion could be eliminated if the definition of x was changed to “total number of equipment leak sources, at all above ground stations”. Or the definition of x in W-30 could be changed to say “total number of each component type”, not equipment leak source, since the term component is used in Tables W-2 through W-7.</p> <p>When EPA revised Equation W-30 the subscript “s” was omitted from EF. The definition for EF</p>		<p>Comment Submission</p>

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	was not amended in the proposed rule, so the definition for EF is found in the final rule and it is listed as EFs.		
	§98.233(q) includes different default values in the definition of GHG_i that follows Equation W-30. Section (u)(2) should be referenced rather than introducing different defaults.		Comment Submission
26. Clarified text in 98.233 (q) and (r) by consistently using terms such as “component type”.	<p>Leak Detection and Leaker Emission Factors</p> <p>Although EPA has proposed revisions to Equation W-30 in 98.233.q, NMGC still feels it is difficult to determine what is being calculated in W-30. Is equation W-30, the sum of emissions from each component type (ie $E_{s,i}$ is emissions from just connectors) from all stations? Or is it the sum of emissions from all components (ie the sum of emissions from connectors, block valves, control valves, pressure relief valves, orifice meters, regulators AND open-ended lines) from all transmission-distribution stations? It is confusing because of the use of the terms component and equipment leak source. Component is defined in the rule, but equipment leak source is not. EPA seems to be using these terms interchangeably and they seem to mean the same thing. For example, the term component is used both in T_p and in equation W-31 definition of Counts whereas equipment leak source is used in the definition of x and $E_{s,i}$ in equation W-30. In addition, although EPA amended the definition of x in equation W-30, it is still confusing. The definition of x in Equation W-30 should more closely match the language for $E_{s,i}$ in equation W-32. Some confusion could be eliminated if the definition of x was changed to “total number of equipment leak sources, at all above ground stations”. Or the definition of x in W-30 could be changed to say “total number of each component type”, not equipment leak source, since the term component is used in Tables W-2 through W-7.</p> <p>When EPA revised Equation W-30 the subscript “s” was omitted from EF. The definition for EF was not amended in the proposed rule, so the definition for EF is found in the final rule and it is listed as EFs.</p>	At least 1 individual.	Comment Submission

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<p>27. Modified the introductory paragraph 98.233(r) regarding population count and emission factors, based on changes in 98.232(i)</p>	<p>The proposed amendments to 98.232.(i) changes the numbering of the distribution emission sources and ends up omitting pipeline main equipment leaks from 98.232(i). In the November 2010 final rule 98.232.i.4 was “pipeline main equipment leaks”. In the September 2011 revision, 98.232.i.4 is listed as “equipment leaks from vaults at below grade metering-regulating stations” with no further edits to the list. The first paragraph in section 98.233.r was not amended and references 98.232.(i) so the list in 98.233.r will need to be revised to reflect these proposed changes.</p>	<p>At least 1 individual.</p>	<p>Comment Submission</p>
<p>28. Clarified that “Count_s” in Equation W-31 is the number of meter/regulator runs for the natural gas distribution industry segment.</p>	<p>Population Count and Emission Factors</p> <p>In Equation W-31, the revised definition for EFs in the proposed rule refers to an “EF for meter/regulating runs at above grade metering-regulating stations”. Did EPA intend for the emission factor to be for meter/regulator runs? NMGC’s understanding is we are using W-31 to calculate emissions from all above grade metering-regulating stations (including above grade TD transfer stations) using an EF generated from Equation W-32.</p> <p>The proposed rule revises 98.233.r.6.ii, to calculate emissions from all above grade metering-regulating stations (including above grade T-D transfer stations) by applying the EF calculated in W-32 and the total count of meter/regulator runs at all above grade metering-regulating stations (inclusive of T-D transfer stations) to Equation W-31. Does this mean we need to count all meter/regulator runs at all metering-regulating stations and use this count as the Counts for equation W-31? A count of meter/regulator runs at all metering-regulating stations would be very time consuming and costly to do. NMGC would have to visit close to 1,000 stations to obtain this count and it would negate the reduced burden EPA included in the final rule of applying a company specific emission factor to a larger set of stations that do not need to be surveyed for leaks. Instead, Counts for calculating emission from all above grade metering-regulating stations (including above grade T-D transfer stations) should be the total count of metering-regulating stations (including T-D transfer stations).</p> <p>In the proposed rule EPA uses a new term, meter/regulator run which is not defined. Does this mean all meter runs and all regulator runs need to be counted at each transmission-distribution</p>	<p>At least 1 individual.</p>	<p>Comment Submission</p>

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	transfer station where a leak survey is conducted? It should mean count meter and/or regulators since a meter can be on a regulator run. A meter on a regulator is just one run not two.		
29. Clarified that reporters without T-D transfer station must only report a count of above grade metering-regulating stations.	Default Emission Factor for MR Stations at Companies with No TD Stations: A related question arises for a few companies that have no TD stations within the meaning of the Proposed Rule. Such companies will not have the option of leak surveying TD stations to develop a company-specific emission factor per metering-regulating run for their MR stations. The rule does not describe what these companies should do. A reasonable solution for this situation is to amend the rule to allow such companies to use the same default emission factor for both above-ground and below-ground MR stations, based on inlet pressure. The equipment is essentially the same. The only difference is whether it is situated above or below ground.	At least 1 individual.	Comment Submission
30. Clarified Equation W-32 for estimating an emission factor for a meter/regulator run at above grade meter-regulating.	Additional Corrections for W-32 and Section 98.233(r): EPA states in the preamble that the agency is proposing to eliminate the summation operator from Equation W-32. See 76 Fed. Reg. at 56,033. [COMMENTER] supports this change. However, it appears that the agency inadvertently failed to remove this summation operator from Equation W-32 in the proposed rule. See 76 Fed. Reg. at 56,045. In this case, it appears the preamble is correct but the proposed rule is not. [COMMENTER] requests that EPA remove the summation operator from Equation W-32 in section 98.,233(r), as the agency apparently intended. Our members have attempted to run calculations using the revised equations in the proposed rule, and they have found this equation is still confusing. Eliminating the summation operator will help remove that confusion.	At least 1 individual.	Comment Submission
31. Modified parameter 'EF' under Equation W-32.	Additional Corrections for W-32 and Section 98.233(r): Further, in the proposed amendments, EF from the equation is listed as EF _i when it is defined. The subscript i is either omitted from the equation or added unnecessarily in the definition for EF.	At least 1 individual.	Comment Submission

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32. Clarified that below grade T-D transfer stations can use the emission factors for below grade metering-regulating stations.	Below Grade TD Stations: The proposed rule is not clear regarding how and whether to calculate emissions separately for below grade TD transfer stations and below grade metering-regulating stations. EPA does not provide an emission factor in Table W-7 for below grade TD transfer stations for calculating emissions in 98.233(r), although EPA does require emissions from below grade TD transfer stations to be reported separately under the proposed amendment to 98.236(c)(16)(.xvi). Conversely, in 98.233(r)(6)(i), below grade TD transfer stations are included with below grade metering-regulating stations suggesting they are to be calculated together and not separately. If EPA does want emissions from below grade TD transfer station to be calculated separately from metering-regulating stations, [COMMENTER] suggests using the same emission factor for both below grade TD transfer stations and below grade metering-regulating stations.	At least 1 individual.	Comment Submission
33. Clarified paragraph 98.233(u)(2)(i) to apply to a sub-basin or facility level depending on the emission source.	<p>Revision: Under 98.233(u), EPA replaced field with sub-basin category. EPA clarified that the mole fraction of GHGs in the natural gas is determined by engineering estimate based on best available data unless otherwise specified. EPA also clarified that if you have a continuous gas composition analyzer, you must use an annual average of the values for determining the mole fraction. Otherwise, an annual average of the available sample analyses for the sub-basin category is used. EPA has also clarified the CH₄ and CO₂ compositions that should be used for the other industry sectors.</p> <p>Comment: Several of the reporting categories that do not require reporting on a sub-basin basis direct you to 98.233(u)(2)(i) for GHG_i compositional analysis. EPA revised 98.233(u) to address issues with determining the appropriate gas composition. For production operations, EPA addressed the gas composition in terms of the sub-basin approach, as shown below. However, there is an inconsistency between 98.233(u)(2) and 98.233(u)(2)(i). 98.233(u)(2) refers to the average mole fraction for each sub-basin category or facility; while 98.233(u)(2)(i) requires the use of available analyses in each sub-basin category. The regulatory text is shown below:</p> <p>(2) For Equation W-35 of this section, the mole fraction, M_i, shall be the annual average mole fraction <i>for each sub-basin category or facility</i>, as specified in paragraphs (u)(2)(i) through (vii)</p>	At least 1 individual.	Comment Submission

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	<p>of this section.</p> <p>(i) GHG mole fraction in produced natural gas for onshore petroleum and natural gas production <i>facilities</i>. If you have a continuous gas composition analyzer for produced natural gas, you must use an annual average of these values for determining the mole fraction. If you do not have a continuous gas composition analyzer, then you must use an annual average gas composition based on available analyses <i>in each of the sub-basin categories</i>.</p> <p>[COMMENTER] requests that 98.233(u)(2)(i) allow for determining average gas composition analysis on either a facility (basin) basis or sub-basin basis, whichever is more appropriate for the specific emission source category.</p>		
<p>34. Clarified paragraph 98.233(v) along with Equation W-36, W-37, and W-38 and associated parameters based on changes in Equation W-1.</p>	<p>Revision: EPA added a time term to equation W-1 to account for the duration the device is operational for the reporting year. T is defined as “Total number of hours in the operating year the devices were operational.”</p> <p>Comment: The term “T” should refer to an estimated average annual time for all the devices or allow the use of 8760 hours. An estimate of the time is consistent with the preamble language stating “EPA is also proposing to amend Equation W-1 to include a parameter ‘T’ that estimates the total number of hours the devices were operational” (emphasis added).</p> <p>Further for this equation, the term “Mass_{s,i}”, does not need the subscript “s”, and the definition does not need “at standard conditions” as mass does not change based on temperature and pressure. [COMMENTER] also requests the term Mass_{s,i} be revised to “mass per type of device” for the different pneumatic device types.</p> <p>The term GHG_i refers to “onshore petroleum and natural gas production facilities” and references paragraph (u)(2)(i), which is defined as “sub-basin”. However, to be consistent with this equation and the methodology for compiling pneumatic device counts, GHG_i should be representative of</p>	<p>At least 1 individual.</p>	<p>Comment Submission</p>

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	all the wells in the basin with a particular device type and not aligned with a sub-basin. Revisions to 98.233(u)(2)(i) to address this are provided in comment W.33.		
35. Modification of parameter 'η' under Equation W-39A and Equation W-39B.	<p>Revision: EPA revised Equation W-39 to account for CO₂ present in the combusted gas, to apply a combustion efficiency, and to separately quantify CH₄ emissions from combustion.</p> <p>Comment: For determining the combustion efficiency, η, [COMMENTER] supports the use of engineering estimate. In addition, [COMMENTER] requests the option of using a combustion efficiency of 99.5%, as referenced in the footnotes of AP-42 Tables 3.2-1, 3.2-1, and 3.2-2.</p> <p>Other issues with §98.233(z):</p> <ul style="list-style-type: none"> For CO₂ and CH₄, the August 4 amendments still require the use of “latest gas analysis for the field” and the issue of referencing §98.3 for the meter calibration if a meter is used. [COMMENTER] restates its concerns that the use of field analysis is inappropriate and that the reference to §98.3 was not intentional. [COMMENTER] recognizes that these issues addressed in the August 19 amendments. [COMMENTER] reserves the right to comment on the September 9 amendments separately. Also, Equations 39 A&B are shown in actual volume terms in both the August 4 and the September 9 amendments. As discussed above, [COMMENTER] requests restating these equations in terms of industry standard conditions (60 °F and 14.7 psia). 	At least 1 individual.	Comment Submission
36. Clarified paragraph 98.233(z)(1)(i).	<p>Revision: EPA has added clarifications on the requirements for combustion emissions under 98.233(z). Natural gas that does not meet the definition of “pipeline quality” is required to use the same approach as used for the combustion of process vent gas or field gas. EPA has removed the requirement that a flow meter must be used if available.</p> <p>Comments:</p> <ul style="list-style-type: none"> A conversion term in Eq. W-40 is 1×10³, but the term in the definition is 1×10⁻³. 	At least 1 individual.	Comment Submission

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	<ul style="list-style-type: none"> • In 98.233(z)(1)(i), the first sentence should be corrected to read "...or a blend containing one or more fuels..." instead of "...or a blend containing one more fuels...". • 98.233(z)(2)(ii) is an example of a non-sub-basin reporting category directing you to 98.233(u)(2)(i) which requires sub-basin composition analysis. (See comment W.34). • In 98.233(z)(2)(i), EPA has added that you may use company records to determine the volume of fuel combusted in the unit during the reporting year. [COMMENTER] fully supports this revision. 		
<p>37. Addition of paragraph 98.233(z)(4) on internal combustion units not related to a compressor that have a rated heat duty below 1 mmBtu/hr.</p>	<p>On page 56034 of the preamble EPA solicits comments as to why emissions from specific internal combustion related equipment should not be reported, including the size of the equipment that should be excluded along with supporting data.</p> <p>Specifically, EPA is seeking comments on the following:</p> <ul style="list-style-type: none"> - "...whether a 1 MMBtu/hr equipment threshold for internal combustion engines that are not driven by natural gas is reasonable." - "...combustion-related emissions at compressors should not be excluded from reporting, regardless of size, and where EPA can find reliable estimates of natural gas consumption." - "... why emissions from specific internal combustion related equipment should not be reported, including the size of the equipment that should be excluded along with supporting data." <p>[COMMENTER] Response:</p> <p>For the onshore petroleum and natural gas production segment, the current rule exempts external combustion equipment with a rated heat capacity < 5 MMBtu/hr from reporting GHG emissions regardless of fuel type.[Footnote 4: See 40 C.F.R. § 98.233(z)(3)] The rule simply requires reporters to report the type and number of each external fuel combustion unit. [COMMENTER]</p>	<p>At least 1 individual.</p>	<p>Comment Submission</p>

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	<p>has welcomed this exemption in the final rule as a means to reducing the reporting burden associated with the small quantity of emissions associated with these sources.</p> <p>[COMMENTER] has noted further that internal combustion equipment with a similar capacity of < 5 MMBtu/hr, regardless of fuel type, should be likewise exempted. The magnitude of emissions from the combustion of internal combustion devices of similar capacity would be no different than for the exempted external combustion devices.</p> <p>Although [COMMENTER] appreciates EPA’s consideration of providing a limited exemption for reporting GHG emissions from small internal combustion engines not fueled with natural gas, [COMMENTER] continues to insist that there is no justification for separate exemption thresholds for internal and external combustion equipment, no justification for limiting such an exemption to engines not fueled by natural gas, and that all combustion equipment, both internal and external, integral to production operations with a rated capacity of < 5 MMBtu/hr should be uniformly exempted from emissions reporting regardless of fuel type.</p> <p>The reporting burden that EPA found not to be justified for small external combustion devices remains unjustified for small internal combustion devices. [COMMENTER] recommends that along with such an exemption, reporters would simply report the type and number of internal combustion units, regardless of fuel type, which are integral to production operations, in each of the following specified size categories: (a) those that are less than or equal to 125hp (<1MMBtu/hr); (b) those that are over 125hp but less than or equal to 375hp (1-3MMBtu/hr); and (c) those that are over 375hp but less than or equal to 625hp (3-5 MMBtu/hr). This is consistent with and provides more detailed information than the approach for the excluded external combustion devices, and would contribute to reducing the reporting burden. This information will enable EPA to estimate the natural gas consumption by these internal combustion engines and thus provide EPA with needed data for future policy development.</p> <p>At the same time, [COMMENTER] wants to reiterate here that the internal combustion engines</p>		

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	<p>addressed by this rule should be limited to those that are “integral to the extraction, processing, or movement of oil or natural gas”, including compressors. This would not include some of the types of engines referenced in the first paragraph on Page 56034 of the preamble to the September 9, 2011 proposed rule, and which are already exempt from emissions reporting based on the promulgated Subpart W requirements.</p>		
<p>38. Modification of paragraph 98.234(a)(1) to include exception for using methods outlined in paragraph 98.234(a)(2).</p>	<p>On Page 56034 of the Federal Register preamble, EPA explains that the language in 98.234(a)(2) is being amended to state that Method 21 compliant instruments may be used to monitor inaccessible emission sources. [COMMENTER] supports this change as it does increase the flexibility in monitoring requirements and reduces the burden on industry without compromising data quality. However, the proposed rule text in 98.234(a)(1) and (2) is confusing. For example, the last sentence in 98.234(a)(1) states that: “An optical gas imaging instrument must be used for all sources types that are inaccessible and cannot be monitored without elevating the monitoring personnel more than 2 meters above a support surface.” Then, the last sentence of 98.234(a)(2) seems to allow the owner/operator to use the alternative leak detection devices as described in paragraph (a)(1) or (a)(2) of this section, which includes Method 21. Assuming the intent discussed in the preamble is correctly understood, [COMMENTER] suggests that EPA clarify in both 98.234(a)(1) and (a)(2) that a Method 21 compliant instrument may be used to monitor inaccessible emission sources that are subject to the monitoring requirements.</p>	<p>At least 1 individual.</p>	<p>Comment Submission</p>

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<p>39. Clarified in 98.234 (c) that if a calibrated bag is used, the bag opening must be sufficient size to encompass the entire emissions volume and the emissions must be below the maximum allowable temperature as specified by the bag manufacturer.</p>	<p>(c) Use calibrated bags (also known as vent bags) only where the emissions are at near-atmospheric pressures [add: and below the maximum temperature specified by the vent bag manufacturer] such that [delete: it] [add: the bag] is safe to handle[add: .] [delete: and can capture all the emissions, below the maximum temperature specified by the vent bag manufacturer, and] [add: The bag must be of sufficient size that] the entire emissions volume can be encompassed for measurement.</p> <p>(1) Hold the bag in place enclosing the emissions source to capture the entire emissions and record the time required for completely filling the bag. If the bag inflates in less than one second, assume one second inflation time.</p> <p>(2) Perform three measurements of the time required to fill the bag, report the emissions as the average of the three readings.</p> <p>(3) Estimate natural gas volumetric emissions at standard conditions using calculations in §98.233(t).</p> <p>(4) Estimate CH₄ and CO₂ volumetric and mass emissions from volumetric natural gas emissions using the calculations in §98.233(u) and (v).</p>	<p>At least 2 individual.</p>	<p>Comment Submission</p>

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	<p>Revision: EPA added clarification to the requirements for using a calibrated bag that the temperature of the source to be measured must be below the maximum temperature specified by the manufacturer and that the bag must be of sufficient size that the entire volume can be encompassed for measurement.</p> <p>Comment: [COMMENTER] requests clarification on EPA’s intent in stating “the bag must be of sufficient size that the entire volume can be encompassed for measurement.” This could be interpreted to mean that the bag must fit over the entire source being measured. Alternatively, this could be interpreted to mean that the bag must be sized to capture the venting volume within a specific time, recognizing, however, that the calibrated bag cannot measure the entire volume.</p>		
<p>40. Clarified that the unique ID is not required for onshore production emission sources throughout 98.236(c).</p>	<p>Unique name ID for specified units</p> <p>EPA added requirements to report a unique name or ID number for each AGR unit, each glycol dehydrator, each blowdown vent stack, each wellhead gas-liquid separator, each flare stack, EOR injection pump blowdowns, and each transmission storage tank.</p> <p>[COMMENTER] Response:</p> <p>[COMMENTER]’s member companies insist strongly that the requirements to develop and report certain Subpart W affected equipment through the use of unique identifier information at the individual equipment level:</p> <ul style="list-style-type: none"> • were not contemplated or proposed in previous proposals, • have not been subject to comment previously, and are unnecessarily onerous, • add substantial costs that were not analyzed nor disclosed in the economic impact analysis, • do not deliver benefits commensurate with the costs, and 	<p>At least 1 individual.</p>	<p>Comment Submission</p>

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	<ul style="list-style-type: none"> are contrary to the original scope and intent of the Greenhouse Gas Reporting Program (GHGRP) and its varying provisions for the different subparts as applicable to specific sectors. <p>This is particularly an issue for wellhead gas-liquid separators with oil throughput greater than or equal to 10 bbls per day. For this source type, EPA has added the requirement to “report the following by sub-basin category, unless otherwise specified” (emphasis added). 98.236(c)(8) goes on to add reporting requirements under paragraphs (J), (K), (L), and (M) that are specified for each separator and not the aggregate of separators as in the existing rule language. These reporting requirements are contrary to EPA’s previously stated goal of their intent to “reduce reporting burden.” The introduction of these new reporting requirements for gas-liquid separators, which have no impact on the current emissions inputs or data quality, under the heading of “Technical Revisions” is clearly contradictory to industry’s efforts to work with EPA to complete an accurate GHG inventory within a manageable reporting burden and resources.</p> <p>The entire concept of basin level reporting for onshore petroleum and natural gas production was justified by EPA through its desire to achieve adequate coverage of the onshore production sector and its economic impact analysis and the concept of reducing burden by handling the vast number of sources as grouped source types rather than discrete emission sources. EPA should not include or imply individual tracking and reporting for separators that are currently reported as total counts or average emissions information. The requirement for creating unique identifiers for individual separators is inconsistent with aggregating equipment and emissions within a basin or sub-basin as currently required in the rule. This proposed change in effect eliminates the benefits from handling separators in the production sector at the sub-basin level, which [COMMENTER] previously supported, and fundamentally changes [COMMENTER]’s acceptance of this approach.</p> <p>For separators, the throughput, existence, and site-specific functionality (wells they service) can vary or change greatly depending on production scenarios throughout the year. Some sites have</p>		

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	<p>multiple separators that may change or be used differently throughout the year, so assigning a unique number on a specific separator and tracking for a whole year does not add clarity or value. [COMMENTER] and its members strongly urge that EPA reconsider its proposal and remove this requirement upon promulgation.</p> <p>For the other equipment types that EPA is proposing to require assigning a unique name or ID number (AGR units, glycol dehydrator, blowdown vent stacks, flare stacks, EOR injection pump blowdowns, and transmission storage tanks), the current level of reporting already relies on individual component counts and equipment inventories that apply to EPA specified calculations. Creating unique equipment identifiers neither adds to the level of accuracy of calculated emissions, nor does it provide information that is not already available through the currently reported individual equipment counts and reported CO₂ and CH₄ emissions totals that are already part of the GHGRP.</p> <p>[COMMENTER] further contends that the identifier data requested by EPA will not be usable at the individual equipment level due to the dynamic nature of the sector and the fact that the identifiers may be tied to well names or locations and hence be different every year due to frequent equipment movement, change-outs and replacements that routinely occur at Oil and Gas well sites. For example, flaring during drilling or completion operations uses either portable flares or open-ended pipe which is moved to new drilling/completion operations. A unique name or ID for the “flare” is meaningless in this situation.</p> <p>This requirement would lead to the expenditure of unnecessary time and resources to create identifiers, which serve no other purpose than to specifically identify equipment that is already called out and accounted for within the current GHGRP process.</p>		
41. Separated reporting requirements for Calculation	<p>Revision: For Well Venting for Liquids Unloading, EPA is proposing a vent measurement for each unique well tubing diameter grouping and pressure grouping in each sub-basin category. Pressure groupings are defined in 98.238 as: ≤ 25 psig; 25-60 psig; 60-110 psig, 110-200 psig;</p>	At least 1 individual.	Comment Submission

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<p>Methodology 1 and Calculation Methodology 2 and 3 in paragraph 98.236(c)(5).</p>	<p>and > 200 psig. Tubing diameter groupings are defined in 98.238 as ≤ 1 inch; 1-2 inches; and ≥ 2 inches. The average flow rate is calculated for each unique tubing diameter grouping and pressure grouping in each sub-basin category by dividing the recorded total flow by the recorded time for a single liquid unloading with venting to the atmosphere. The revisions also state that for a new producing sub-basin category, an average flow rate is calculated beginning in the first year of production.</p> <p>Comment: EPA has modified the terms used in Equation W-7 to address the groupings by tubing diameter and pressure. However, the emissions resulting from Equation W-7 are inconsistent with the reporting requirements under 98.236(c)(5). It appears, though it is not explicitly stated, that Equation W-7 is intended to result in emissions summed for the sub-basin, while the reporting requirements are for each well tubing diameter and pressure grouping. [COMMENTER] interprets Equation W-7 to result in emissions aggregated for the sub-basin and requests that the reporting requirements be modified to be consistent.</p> <p>The reporting requirements are further confused by combining the requirements for Methodologies 1, 2, and 3 all under the same paragraph of 98.236(c)(5). [COMMENTER] requests that EPA specify separate reporting requirements for Methodology 1.</p> <p>Methodology 1 indicates that the pressure groupings apply across each of the sub-basin category (conventional and unconventional) and tubing grouping. [COMMENTER] has provided separate comments specifically addressing the pressure groupings under comment W.56.</p> <p>As indicated in comment W.58, [COMMENTER] proposes the use of two tubing diameter groupings, rather than the three proposed by EPA. In addition, while the pressure and tubing groupings only apply to Methodology 1, the reporting requirements under 98.236(c)(5) require reporting emissions for each tubing diameter and pressure grouping for Methodologies 2 and 3 as well. [COMMENTER] requests that EPA remove the reporting requirements by pressure grouping for Methodologies 2 and 3 since these groupings do not apply to calculation</p>		

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	Methodologies 2 and 3.		
42. Modified paragraph 98.236(c)(6)(i) to include reference of sub-basin and well type for hydraulic fracturing and to include reporting requirements for Equation W-10B.	<p>Revision: EPA revised Equation W-10, but not as [COMMENTER] had requested in our July 29, 2011 correspondence to EPA.</p> <p>Comment: In an e-mail provided to EPA on July 29, 2011, [COMMENTER] provided regulatory revisions to Equation W-10. [COMMENTER] proposed to remove the subtraction of the SG term and define the “flow-back volume” term in Equation W-10 by limiting it only to the time span during which gas is actually vented to the atmosphere or flared. The SG_p term should be removed and FRM should be revised to reflect venting to the atmosphere. SG_p is not needed since T is defined as the hours vented. If a well is venting, then it is not recovering to sales.</p> <p>These proposed revisions add clarity, simplify the calculation, and reflect the emissions characteristics of flow-back operations. Without the removal of the SG term, Equation W-10 has the potential to either lead to the calculation of a negative emissions value, or compare emissions values vented to the atmosphere to sales values that are produced against the back-pressure of a gathering or sales pipeline; these are two completely different operating scenarios. [COMMENTER]’s proposed mark-ups to incorporate the changes for 98.233(g) are provided in Section 4 of these comments.</p> <p>EPA has added language defining the number of measurements required based on the number of workovers/completions. [COMMENTER] interprets this requirement to apply to the sub-basin. Clarification is needed that the number of measurements required is relative to a sub-basin or basin (facility) and well type combination and not total number of completions/workovers.</p> <p>In addition, [COMMENTER] requests the addition of a new equation that sums available measurements and eliminates the need for normalizing and tracking cumulative venting time. Some companies are planning to measure the venting associated with gas well completion and</p>	At least 1 individual.	Comment Submission

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	workovers with hydraulic fracturing. Equation W-10 does not allow the use the actual measurements. [COMMENTER] has included this new equation in the proposed revisions provided in Section 4 below.		
43. Modification of paragraph 98.236(c)(7) regarding data reporting requirements for blowdown vent stacks.	<p>6. Reporting Requirements: §98.236(c)(7)(i) reporting for blowdown vents should be revised. In addition, to complement the Proposed Rule and the September 9 proposed revisions, EPA will need to revise the recently adopted criteria in Subpart A Table A-7 regarding data elements where reporting is deferred until 2015.</p> <p>§98.236(c)(7)(i) reporting for blowdowns includes the number of blowdowns "per unique volume type". As indicated by [COMMENTER] recommendations (see EPA-HQ-OAR-2011-0512-0013), an alternative equation is needed (i.e., summing the annual blowdown volumes by event). With that approach, only the total volume should be reported. "Unique volume type" is a misnomer for determining compressor station blowdown emissions because most events will be associated with a unique circumstance and repetitive blowdown of the same volume is not the norm. The reporting section for blowdown vents should be revised to include reporting associated with the current equation (which is revised to Equation W-14A in the September 9 proposed revisions) and separate criteria for blowdown emissions calculated by summing individual events (i.e., see approach associated with Equation W-14B in the September 9 proposed technical corrections). [COMMENTER] will provide additional details in October comments on the second proposal.</p>	At least 1 individual.	Comment Submission
44. Removal of requirement to report per wellhead separator or storage tank in 98.236 (c)(8)(i)(J) through (L).	<p>Unique name ID for specified units</p> <p>EPA added requirements to report a unique name or ID number for each AGR unit, each glycol dehydrator, each blowdown vent stack, each wellhead gas-liquid separator, each flare stack, EOR injection pump blowdowns, and each transmission storage tank.</p> <p>[COMMENTER] Response:</p>	At least 1 individual.	Comment Submission

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	<p>[COMMENTER]’s member companies insist strongly that the requirements to develop and report certain Subpart W affected equipment through the use of unique identifier information at the individual equipment level:</p> <ul style="list-style-type: none"> • were not contemplated or proposed in previous proposals, • have not been subject to comment previously, and are unnecessarily onerous, • add substantial costs that were not analyzed nor disclosed in the economic impact analysis, • do not deliver benefits commensurate with the costs, and • are contrary to the original scope and intent of the Greenhouse Gas Reporting Program (GHGRP) and its varying provisions for the different subparts as applicable to specific sectors. <p>This is particularly an issue for wellhead gas-liquid separators with oil throughput greater than or equal to 10 bbls per day. For this source type, EPA has added the requirement to “report the following by sub-basin category, unless otherwise specified” (emphasis added). 98.236(c)(8) goes on to add reporting requirements under paragraphs (J), (K), (L), and (M) that are specified for each separator and not the aggregate of separators as in the existing rule language. These reporting requirements are contrary to EPA’s previously stated goal of their intent to “reduce reporting burden.” The introduction of these new reporting requirements for gas-liquid separators, which have no impact on the current emissions inputs or data quality, under the heading of “Technical Revisions” is clearly contradictory to industry’s efforts to work with EPA to complete an accurate GHG inventory within a manageable reporting burden and resources.</p> <p>The entire concept of basin level reporting for onshore petroleum and natural gas production was justified by EPA through its desire to achieve adequate coverage of the onshore production sector and its economic impact analysis and the concept of reducing burden by handling the vast number of sources as grouped source types rather than discrete emission sources. EPA should not include</p>		

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	<p>or imply individual tracking and reporting for separators that are currently reported as total counts or average emissions information. The requirement for creating unique identifiers for individual separators is inconsistent with aggregating equipment and emissions within a basin or sub-basin as currently required in the rule. This proposed change in effect eliminates the benefits from handling separators in the production sector at the sub-basin level, which [COMMENTER] previously supported, and fundamentally changes [COMMENTER]'s acceptance of this approach.</p> <p>For separators, the throughput, existence, and site-specific functionality (wells they service) can vary or change greatly depending on production scenarios throughout the year. Some sites have multiple separators that may change or be used differently throughout the year, so assigning a unique number on a specific separator and tracking for a whole year does not add clarity or value. [COMMENTER] and its members strongly urge that EPA reconsider its proposal and remove this requirement upon promulgation.</p> <p>For the other equipment types that EPA is proposing to require assigning a unique name or ID number (AGR units, glycol dehydrator, blowdown vent stacks, flare stacks, EOR injection pump blowdowns, and transmission storage tanks), the current level of reporting already relies on individual component counts and equipment inventories that apply to EPA specified calculations. Creating unique equipment identifiers neither adds to the level of accuracy of calculated emissions, nor does it provide information that is not already available through the currently reported individual equipment counts and reported CO2 and CH4 emissions totals that are already part of the GHGRP.</p> <p>[COMMENTER] further contends that the identifier data requested by EPA will not be usable at the individual equipment level due to the dynamic nature of the sector and the fact that the identifiers may be tied to well names or locations and hence be different every year due to frequent equipment movement, change-outs and replacements that routinely occur at Oil and Gas well sites. For example, flaring during drilling or completion operations uses either portable flares</p>		

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	<p>or open-ended pipe which is moved to new drilling/completion operations. A unique name or ID for the “flare” is meaningless in this situation.</p> <p>This requirement would lead to the expenditure of unnecessary time and resources to create identifiers, which serve no other purpose than to specifically identify equipment that is already called out and accounted for within the current GHGRP process.</p>		
45. Clarified the reference in 98.236(c)(10) because a new equation was added under 98.233 (1).	<p>G. Well testing venting and flaring On page 56031 of the September 9, 2011 preamble, EPA is addressing well testing and venting and flaring. Among other things, EPA is considering, but has not yet proposed, using the production rate to estimate the volume of emissions from venting and testing gas wells that produce dry gas. EPA is soliciting comments on this suggested provision for gas wells.</p> <p><u>Commenter Response:</u> Commenter agrees that production rate could be used as an estimate of gas flow rate.</p>	At least 1 individual.	Comment Submission
46. Clarifications to the level of reporting required in 98.236(c)(15)(ii)(B).	<p>Revision: 98.236(c)(15)(ii)(b) requires reporting fugitive emissions for each type of major equipment by sub-basin category. However, Equation W-31, which is the calculation approach applied for fugitive emissions by population counts is applied at the facility (i.e. basin) level.</p> <p>Comment: The reporting requirements should align with the calculation method. The definitions for “Count” and “GHG_i” Equation W-31 clearly refer to the facility. [COMMENTER] requests that the reporting requirements be revised accordingly.</p>	At least 1 individual.	Comment Submission
47. Addition of rolling average reporting requirement for above grade T-D transfer stations.	Under the Proposal, EPA is replacing the term "custody transfer city gate station" with the term "Transmission-distribution (TD) transfer station". This replacement will sweep in many more stations into the resource-intensive on site leak survey requirement than appear to be covered under the current rule. Survey data from larger stations should be sufficient to develop an emission factor that can be applied to smaller stations. We urge EPA to impose the leak survey requirement only on TD Stations with a design rate of 4 million standard cubic feet per hour (scf/hr). This level will focus the leak surveys on a manageable number of stations.	At least 2 individual.	Comment Submission

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	<p>I. New Definition of Stations Subject to Annual Leak Surveys: BAMB Essential to Deal with Retroactive Application to 2011</p> <p>While [COMMENTER] appreciates EPA’s effort to provide clear definitions of what is or is not subject to the annual component leak surveys, we are very concerned about the dramatic shift in the type and number of stations that would be subject to the annual leak survey requirement under the Proposal. We are further concerned that these new requirements would apply retroactively to the beginning of 2011, even though the Technical Revisions are not expected to be issued in final form until December 2011. Obviously, natural gas local distribution companies (LDCs) have had to make their best guess this year regarding which stations they should leak survey under the existing Subpart W rule, and in December 2011 they will not be able to turn the clock back to January 2011 and re-do their Subpart W leak survey program. We understand that the agency is suggesting that LDCs will be allowed to deal with this dilemma by submitting the leak surveys they have conducted and/or apply an emission factor to a count of stations under the Best Available Monitoring Methods (BAMB) provisions. See 76 Fed. Reg. at 56,032. It will be important to make this clear in the final rule and preamble.</p>		
<p>48. Added separate reporting requirements for internal combustion engines with a rated heat duty of above 1 mmBtu/hr and a rated heat duty of below 1 mmBtu/hr.</p>	<p>On page 56034 of the preamble EPA solicits comments as to why emissions from specific internal combustion related equipment should not be reported, including the size of the equipment that should be excluded along with supporting data.</p> <p>Specifically, EPA is seeking comments on the following:</p> <ul style="list-style-type: none"> - “...whether a 1 MMBtu/hr equipment threshold for internal combustion engines that are not driven by natural gas is reasonable.” - “...combustion-related emissions at compressors should not be excluded from reporting, regardless of size, and where EPA can find reliable estimates of natural gas consumption.” - “... why emissions from specific internal combustion related equipment should not be reported, 	<p>At least 1 individual.</p>	<p>Comment Submission</p>

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	<p>including the size of the equipment that should be excluded along with supporting data.”</p> <p>[COMMENTER] Response:</p> <p>For the onshore petroleum and natural gas production segment, the current rule exempts external combustion equipment with a rated heat capacity < 5 MMBtu/hr from reporting GHG emissions regardless of fuel type.[Footnote 4: See 40 C.F.R. § 98.233(z)(3)] The rule simply requires reporters to report the type and number of each external fuel combustion unit. [COMMENTER] has welcomed this exemption in the final rule as a means to reducing the reporting burden associated with the small quantity of emissions associated with these sources.</p> <p>[COMMENTER] has noted further that internal combustion equipment with a similar capacity of < 5 MMBtu/hr, regardless of fuel type, should be likewise exempted. The magnitude of emissions from the combustion of internal combustion devices of similar capacity would be no different than for the exempted external combustion devices.</p> <p>Although [COMMENTER] appreciates EPA’s consideration of providing a limited exemption for reporting GHG emissions from small internal combustion engines not fueled with natural gas, [COMMENTER] continues to insist that there is no justification for separate exemption thresholds for internal and external combustion equipment, no justification for limiting such an exemption to engines not fueled by natural gas, and that all combustion equipment, both internal and external, integral to production operations with a rated capacity of < 5 MMBtu/hr should be uniformly exempted from emissions reporting regardless of fuel type.</p> <p>The reporting burden that EPA found not to be justified for small external combustion devices remains unjustified for small internal combustion devices. [COMMENTER] recommends that along with such an exemption, reporters would simply report the type and number of internal combustion units, regardless of fuel type, which are integral to production operations, in each of the following specified size categories: (a) those that are less than or equal to 125hp</p>		

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	<p>(<1MMBtu/hr); (b) those that are over 125hp but less than or equal to 375hp (1-3MMBtu/hr); and (c) those that are over 375hp but less than or equal to 625hp (3-5 MMBtu/hr). This is consistent with and provides more detailed information than the approach for the excluded external combustion devices, and would contribute to reducing the reporting burden. This information will enable EPA to estimate the natural gas consumption by these internal combustion engines and thus provide EPA with needed data for future policy development.</p> <p>At the same time, [COMMENTER] wants to reiterate here that the internal combustion engines addressed by this rule should be limited to those that are “integral to the extraction, processing, or movement of oil or natural gas”, including compressors. This would not include some of the types of engines referenced in the first paragraph on Page 56034 of the preamble to the September 9, 2011 proposed rule, and which are already exempt from emissions reporting based on the promulgated Subpart W requirements.</p>		
<p>49. Amended paragraph 98.236 (e).</p>	<p>Revision: EPA has added a requirement to report average [COMMENTER] gravity, average gas to oil ratio, and average low pressure separator pressure for each sub-basin category. On page 56034 of the September 9, 2011 preamble EPA contends that this information is already known to reporters and it plans to use these facility sub-basin characteristics to characterize other emissions sources across different sub basins.</p> <p>Comment: This information is not available or appropriate for broader applications to each of the sub-basin categories. For example, dry gas production areas, such as coal-bed methane, will not have [COMMENTER] gravity or gas to oil ratios to report for a sub-basin.</p> <p>[COMMENTER] interprets this reporting requirement as applicable only to the oil production sub-basin category proposed for addition by [COMMENTER]. Only this sub-basin category is consistent with the preamble language, which indicates that this information is readily available.</p> <p>For the oil production sub-basin category, this requirement should only apply to separators with oil throughput greater than or equal to 10 barrels per day, as it is only for these operations where</p>	<p>At least 1 individual.</p>	<p>Comment Submission</p>

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	this information is available. [COMMENTER] also interprets the requirement to report the low pressure separator pressure to refer only to the separator pressure in those instances where the separator oil composition is sampled and analyzed.		
50. Modification of paragraph 98.238, the definition of ‘Associated with a single well-pad’.	<p>Revision: EPA added a new definition for “associated with a single well-pad”.</p> <p>Comments: EPA needs to clarify what the word “This” is referring to in the beginning of the last sentence. [COMMENTER] suggests the following revisions to the definition as shown in green font:</p> <ul style="list-style-type: none"> Associated with a single well-pad means associated with the hydrocarbon stream as produced from one or more wells located on that single well-pad. For all equipment with the exception of storage and condensate tanks, the exclusion for the association ends where the stream from a single well-pad is combined with streams from one or more additional single wellpads, where the point of combination is located off that single well-pad. This does not includes storage and condensate tanks that are located downstream of the point of combination. <p>[COMMENTER] offers the diagrams provided in Section 3, which illustrate [COMMENTER]’s understanding of the proposed definition for “associated with a well-pad” and the proposed revised source category definition for onshore petroleum and natural gas production. [COMMENTER] is providing this information to companies as a tool to guide industry to classify their emission sources for data collection and reporting, although we realize that it is too cumbersome to include in regulatory language.</p>	At least 1 individual.	Comment Submission
51. Addition of “meter/regulator run” definition.	<p>Equation W-32 and §98.233(r)(2)(ii):</p> <p>The preamble incorrectly states that the agency is proposing to amend Equation W-32 to yield an emission factor in cubic feet “per meter to be used in Equation W-31 for above ground metering-regulating stations.” See 76 Fed. Reg. at 56,033. We think you meant to say “per metering-</p>	At least 1 individual.	Comment Submission

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	<p>regulating station.” If the emission factor in the Proposal is to apply to a count of meters, we would have a problem, because the emission factor is supposed to apply to some stations where there are no meters. Recall that the proposed term “metering-regulating station” is defined to include stations that have (1) a pressure regulator but not a meter; or (2) a meter but not a pressure regulator; or (3) both a meter and a regulator. See 76 Fed. Reg. at 56,050. Fortunately, the actual proposed rule language in Equation W-32 correctly directs LDCs to count the “[t]otal number of meter/regulator runs at all TD transfer stations.” 76 Fed. Reg. at 56,045. Proposed section 98.233(e)(6)(ii) also correctly uses the term “meter/regulator runs.”</p> <p>Define Meter/Regulator Run: [COMMENTER] supports changing the emission factor so that it is based on a count of meter/regulator runs rather than a count of “meters.” However, we urge EPA to define this new term “meter/regulator run.” There is no definition in the proposed rule. We suggest the following definition:</p> <p>“Meter/ regulator run means a series of components used in regulating pressure or metering natural gas or both.”</p>		
<p>52. Modified definition or “Pressure group” under paragraph 98.238.</p>	<p>Revision: EPA added a new definition for “pressure groupings”: Pressure groupings are defined as follows: less than or equal to 25 psig; greater than 25 psig and less than or equal to 60 psig; greater than 60 psig and less than or equal to 110 psig; greater than 110 psig and less than or equal to 200 psig; and greater than 200 psig.</p> <p>Comments:</p> <ul style="list-style-type: none"> • As noted in comment W.13, the pressure groupings only apply to Methodology 1 for the liquids unloading emission source. • Also as noted in comment W.13 above, Methodology 1 indicates that the pressure groupings apply across each of the sub-basin category (conventional and unconventional) and tubing grouping. This is inconsistent with previous discussions with EPA, where pressure grouping were discussed only in the context of conventional wells. [COMMENTER] requests that the regulatory language clarify that pressure groupings are only applicable to conventional wells. 	<p>At least 1 individual.</p>	<p>Comment Submission</p>

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	<ul style="list-style-type: none"> In discussions with EPA and an e-mail sent on June 22, 2011, [COMMENTER] proposed two pressure groupings for Conventional formations based on flowing wellhead pressure. [COMMENTER] requests that the pressure groupings be limited to two pressure groupings as originally proposed by the [COMMENTER]. Based on the pressure regimes EPA included in this amendment, the two recommended pressure groupings would be < 110 psig and > 110 psig. Requiring five pressure groupings for three tubing diameter groupings and four formation types per county is excessive considering the logistics involved with capturing calibrated metered vent rates. Two pressure groupings will still provide EPA with the desired representative data and sufficient data granularity for future policy development. <p>[COMMENTER] recognizes that there may be some concerns regarding the range of the two proposed pressure groupings and would propose that the pressure of the representative metered vent rates be within $\pm 10\%$ of the average pressure of the range ($\Sigma P / \text{well count}$) to address this issue.</p> <ul style="list-style-type: none"> EPA does not define what pressure is to be used for the pressure groupings. [COMMENTER] interprets the pressure groupings to be based on the surface pressure. As EPA indicated in Appendix D of the Technical Support Document associated with these proposed amendments, reservoir shut-in pressure is not available in the public domain. [COMMENTER] agrees with this assessment, and as indicated in Comment W.14 reservoir shut-in pressure is not reliably available in operations either. 		
53. Modifications to the definition of “Sub-basin category” under 98.238 and removal of the definition of “oil well” and “gas well”.	<p>Revision: EPA added a new definition for “sub-basin category”.</p> <p>Comments: [COMMENTER] requests the following revisions, shown in green font:</p> <p>Sub-basin category, for onshore natural gas production, means a subdivision of a basin into the unique combination of wells with the surface coordinates within the boundaries of an individual county and subsurface completion in one or more of each of the following [add (green): five]</p>	At least 1 individual.	Comment Submission

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Technical Issue	Questions Submitted to EPA	Type and approximate number of submittals	Reference
	<p>[delete (green): four] formation types: [add (green): oil, conventional gas, shale gas, coal seam, or other tight reservoir rock. The distinction between conventional gas and tight gas reservoirs shall be [delete (green): as] [add (green): designated as:] [delete (green): by 18 C.F.R. 270.305:] conventional with >0.1 millidarcy permeability, and unconventional tight with =0.1 millidarcy permeability. [add (green): Permeability for a reservoir type shall be determined by engineering estimate.] [delete (green): Unconventional formation types are either shale, coal seam, or other tight reservoir rock.] Wells producing from more than one [delete (green): unconventional] formation type shall be classified into only one type based on the formation with the most contribution to production as determined by engineering knowledge. [delete (green): Unconventional wells producing in two or more formation types of “shale and coal seam”, “shale and other tight”, or “shale, coal seam, and other tight”; are considered shale. In addition, unconventional wells producing in “coal seam and other tight” formations are considered coal.]</p> <ul style="list-style-type: none"> • [COMMENTER] requests the revisions noted above. Deleting “unconventional” in the third sentence clarifies how to distinguish between wells that produce from co-mingled conventional and unconventional formations (the previous language did not address this situation). In addition, the last two sentences appear contradictory. [COMMENTER] prefers to assign formation types by the highest contribution to production based on engineering knowledge. • In the preamble (page 56026 middle column), EPA indicates “In the event that there is more than one formation, then the reporters would use the most specific designation.” This seems to imply that only one formation type is assigned per county. Whereas the rule language assigns the formation type by well, with only one designation to each well. [COMMENTER] prefers the approach described in the preamble and requests additional clarification in the rule language if EPA’s intent is for reporters to assign only one formation type per county. If the intent is for reporters to assign only one formation type per county, then EPA would need to clarify what is meant by “most specific designation”. • The revisions above address [COMMENTER]’s concern that a sub-basin category for oil production was not previously defined. 		

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54. Clarification to the definition of “transmission-distribution transfer station”	<p>EPA is now proposing to replace the term “custody transfer city gate station” with the term Transmission-distribution (TD) transfer station” defined in proposed revised section 98.238 to mean:</p> <p style="padding-left: 40px;">“a meter-regulating station where a local distribution company takes part or all of the natural gas from a transmission pipeline and puts it into a distribution pipeline.</p> <p>The term “metering-regulating station” is also defined in revised §98.238. We believe this is the clearer term and should be used consistently instead of “meter-regulating station” as used in the TD station definition above.</p>	At least 1 individual.	Comment Submission
55. Clarification to the definition of “tubing diameter groupings”.	<p>Revision: EPA added a new definition for “tubing diameter groupings”: Tubing diameter groupings are defined as follows: less than or equal to 1 inch; greater than 1 inch and less than 2 inch; and greater than or equal to 2 inch.</p> <p>Comment: [COMMENTER] supports this grouping concept. However, tubing diameters for completions are not commonly less than 1 inch. [COMMENTER] suggests that two categories of tubing diameter be used based on the most common tubing sizes used in completions: ≤ 2 3/8” nominal diameter and > 2 3/8” nominal diameter.</p>	At least 1 individual.	Comment Submission
56. Clarification to the definition of “well testing venting and flaring”.	<p>Revision: EPA added a new definition for “well testing venting and flaring”: Well testing venting and flaring means venting and/or flaring of natural gas at the time the production rate of a well is determined <i>for regulatory purposes (i.e., the well testing) through a choke (an orifice restriction)</i>. If well testing is conducted immediately after well completion or workover, then it is considered part of well completion or workover.</p> <p>Comment: [COMMENTER] suggests the revisions shown above in green font to make the definition technically correct. [COMMENTER] supports the clarification that well testing conducted after a well completion or workover, is considered part of the completion or workover.</p>	At least 1 individual.	Comment Submission

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<p>57. Modification of emission factor in Table W-1A for Low Continuous Bleed Pneumatic Device Vents, High Continuous Bleed Pneumatic Device Vents, Intermittent Bleed Pneumatic Device Vents, and Pneumatic Pump</p>	<p>[COMMENTS] notes that EPA has not proposed revisions to the pneumatic emission factors for the production sector. [COMMENTS] had previously pointed out an error in the emission factors provided in Table W-1A. Below, [COMMENTS] provides a corrected derivation for these emission factors:</p> <p>Pneumatic Device Emission Factor Correction</p> <p>[COMMENTS] Question (Response Tracker 4844-40) The derivation provided in the Technical Support Document (TSD) for the high bleed, low bleed, and intermittent bleed pneumatic device emission factors provided in Table W-1A introduces an error. Footnote 3. U.S. Environmental Protection Agency (EPA). Greenhouse Gas Emissions Reporting from the Petroleum and Natural Gas Industry, Background Technical Support Document, U.S. EPA, Climate Change Division, Washington, DC. <http://www.epa.gov/climatechange/emissions/downloads10/Subpart-W_TSD.pdf>] The derivation incorrectly divides by the CH₄ weight fraction (e.g. D=0.788). The correct values are provided in the API Compendium (Table 5-15; based on scf/day of natural gas at 60 °F).</p> <p>EPA Response (January 28, 2011): The emission factors in Table W-1A are correct. The emission factors in Table 5-15 of the API compendium are Methane (CH₄) emission factors, where as the emission factors in Table W-1A are Whole Gas emission factors.</p> <p>[COMMENTS] Follow-up: It appears EPA misunderstood the emission factors they have cited from the API Compendium. Table 5-15 of the 2009 API Compendium provides emission factors for pneumatic devices in two sets of units. The first column cites emission factors from the original reference in the same units</p>	<p>At least 1 individual.</p>	<p>Comment Submission</p>

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	<p>as the original reference. The original reference for the emission factors of interest is the data set used to develop the emission estimates provided in Volume 12 of the GRI/EPA 1996 study and the derivation provided in Table B-14 of the API Compendium. [Footnote 4 Shires, T.M. and M.R. Harrison. Methane Emissions from the Natural Gas Industry, Volume 12: Pneumatic Devices, Final Report, GRI-94/0257.29 and EPA-600/R-96-0801, Gas Research Institute and U.S. Environmental Protection Agency, June 1996. http://www.epa.gov/gasstar/documents/emissions_report/12_pneumatic.pdf] As shown in both Compendium Tables 5-15 (Column labeled "Emission Factor, Original Units) and B-14 (Column labeled "Bleed Rate (scf/day)), the units are in scf of gas per device. The emission factors are then converted to tonnes CH₄/device-yr in the far right-hand column of Table 5-15 and the bottom row of Table B-14.</p> <p>The TSD incorrectly labels the emission factor units as scfd CH₄/device and then divides by the CH₄ mole% in an attempt to convert the emission factor to a total gas basis. This erroneously increases the emission factors. The TSD calculations should be corrected to show the following:</p> <p>"High Continuous Bleed Pneumatic Device Vents" Methodology</p> <p>37.9 scf/hour/component EF = (705.7 From Compendium Table B-14 [scfd CH₄/pneumatic devises, high bleed]) * (B) / (D) / (E)</p> <p>OR</p> <p>37.9 scf/hour/component EF = (896 [scfd gasCH₄/pneumatic devises, high bleed]) * (B) / (D) / (E)</p> <p>At industry standard conditions of 60 °F, the emission factor is 37.3 scfh/device</p> <p>Conversions:</p>		

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Technical Issue	Questions Submitted to EPA	Type and approximate number of submittals	Reference
	<p>B: $1.015 = (68+459.67)/(60+459.67)$ = conversion from 60°F to 68°F [[COMMENTER] suggests removing this conversion and requests that the emission factors be provided at industry standard conditions of 60 °F.]</p> <p>D: 78.8% – production quality of natural gas (% methane), taken from Table B-14 of the 2009 API Compendium [This should be shown as 0.788, as used in the equation.]</p> <p>E: 24 hours/day</p> <p>Low Continuous Bleed Pneumatic Device Vents” Methodology</p> <p>1.41 scf/hour/component EF = (26.3 From Compendium Table B-14 [scfd CH₄/pneumatic devises, low bleed) * (B) / (D) / (E)</p> <p>OR</p> <p>1.41 scf/hour/component EF = (33.4 [scfd gasCH₄/pneumatic devises, low bleed]) * (B) / (D) / (E)</p> <p>At industry standard conditions of 60 °F, the emission factor is 1.39 scfh/device</p> <p>Conversions:</p> <p>B: $1.015 = (68+459.67)/(60+459.67)$ = conversion from 60°F to 68°F [[COMMENTER] suggests removing this conversion and requests that the emission factors be provided at industry standard conditions of 60 °F.]</p> <p>D: 78.8% – production quality of natural gas (% methane) [This should be shown as 0.788, as used in the equation.]</p> <p>E: 24 hours/day</p> <p>“Intermittent Bleed Pneumatic Device Vents” Methodology</p>		

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	<p>13.7 scf/hour/component EF = (323 From GRI/EPA CH₄ Study, Vol. 12, Table 4-6[scfd gasCH₄/pneumatic devises, low bleed]) * (B) / (D) / (E)</p> <p>At industry standard conditions of 60 °F, the emission factor is 13.5 scfh/device</p> <p>Conversions: B: $1.015 = (68+459.67)/(60+459.67) =$ conversion from 60°F to 68°F [[COMMENTER] suggests removing this conversion and requests that the emission factors be provided at industry standard conditions of 60 °F.] D: 78.8% — production quality of natural gas (% methane) 44 E: 24 hours/day</p> <p>The corrected emission factors, derived above for industry standard conditions of 60 °F and 14.7 psia, are summarized below.</p> <ul style="list-style-type: none"> - High Continuous Bleed Pneumatic Device Vents= 37.3 scfh/device - Low Continuous Bleed Pneumatic Device Vents= 1.39 scfh/device - Intermittent Bleed Pneumatic Device Vents = 13.5 scfh/device 		
<p>58. Modification of emission factor in Table W-3 and W-4 for Intermittent Bleed Pneumatic Device Vents</p>	<p>Separate emission factors are warranted for high-bleed and intermittent-bleed devices. In Table W-3 and Table W-4 of Subpart W, the same emission factor is applied to high continuous bleed pneumatic device vents and intermittent bleed pneumatic device vents. The Subpart W Technical Support Document (TSD) indicates the emission factor is from the GRI Methane Emissions from the Natural Gas Industry” study. This study and other reference documents provide different emission factor "tiers". The Subpart W factor is a “Tier 2” emission factor derived from the “Tier 3” continuous and intermittent bleed emission factors (shown in Table 1 below), and the estimated relative populations of each device type. Tier 2 emission factors are appropriate when pneumatic device counts do not distinguish between continuous bleed and intermittent bleed</p>	<p>At least 1 individual.</p>	<p>Comment Submission</p>

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Technical Issue	Questions Submitted to EPA	Type and approximate number of submittals	Reference
	<p>devices, but Subpart W requires separate counts of continuous bleed and intermittent bleed devices (i.e., Tier 3 activity data). Thus, Tier 3 intermittent device emission factors from the GRI study would appear more appropriate.</p> <p>Table 1 lists the Tier 3 and Tier 2 emission factors from the GRI study. For intermittent bleed devices, separate Tier 3 emission factors for turbine valve operators and pneumatic/hydraulic valve operators could be used or a weighted average Tier 3 intermittent bleed emission factor (i.e., 2.51 scf NG/hr) could be used as shown in Table 1.</p> <p>Table 1. Pneumatic Device Emission Factors for Transmission and Storage</p> <p>Emission Source: Gas-driven continuous bleed pneumatic devices Emission Factor* Tier: 3 Emission Factor* scf NGA/ device-yr: 505,000 Emission Factor* scf NGA/ device-hr : 57.7 Reference Tier D</p> <p>Emission Source: Turbine valve operator (Intermittent bleed) Emission Factor* Tier: 3 Emission Factor* scf NGA/ device-yr: 68,600 Emission Factor* scf NGA/ device-hr : 7.84 Reference Tier D</p> <p>Emission Source: Pneumatic/hydraulic valve operator (Intermittent) Emission Factor* Tier: 3 Emission Factor* scf NGA/ device-yr: 5,710 Emission Factor* scf NGA/ device-hr : 0.652 Reference Tier D</p>		

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	<p>Emission Source: Intermittent bleed pneumatic device Emission Factor* Tier: 3B Emission Factor* scf NGA/ device-yr: 22,000 Emission Factor* scf NGA/ device-hr : 2.51 Reference Tier D</p> <p>Emission Source: Gas-operated pneumatic devices Emission Factor* Tier: 2C Emission Factor* scf NGA/ device-yr: 176,000 Emission Factor* scf NGA/ device-hr : 20.1 Reference Tier D</p> <p>* Emission factors reported to three significant figures for consistency with Subpart W. A. Based on standard temperature of 68°F and standard pressure of 14.73 psi B. Weighted average of Tier 3 emission factors for intermittent bleed devices C. Weighted average of Tier 3 emission factors for continuous bleed and intermittent bleed devices D. Emission factors based on data collected for the 1996 GRI/EPA Study. These emission factors are also included in the [COMMENTER] GHG Guidelines, API Compendium, GRI GHGCalc™, and the U.S. Inventory of Greenhouse Gas Emissions and Sinks.</p> <p>In addition, these emission factors are based on a small emissions data set that was collected in the early 1990's. Thus, these emission factors may not be representative of pneumatic devices currently used in the natural gas T&S segments and of questionable accuracy when developing emission estimates. This issue is of particular concern for the intermittent bleed device emission factors, which may not reflect integration of current generation “no bleed or low bleed” devices.</p> <p>The emission factor engineering units should be revised. The Proposed Rule units for the emission factors are “scf THC/device-hr.” The emission factor units should be “scf NG/devicehr”</p>		

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	<p>based on the data used to develop the emission factors. NG (natural gas) is the appropriate basis for the engineering units and THC (total hydrocarbons) is not appropriate or equivalent nomenclature. For example, analysis on a THC basis would typically be expressed as methane equivalents for natural gas and provides a different result unless the gas is 100% methane.</p> <p>The low bleed emission factor is based on data from a different industry segment. The Subpart W emission factor for continuous low-bleed pneumatic devices is from Table 5-15 from the API Compendium. The data used to develop this emission factor are included in Appendix B.5 of the API Compendium, and these data originate from the 1996 GRI/EPA Study. A review of these data shows: (1) the emission factor is based on a total of seven devices. Six of the devices are from a single Oil Battery measured for a 1992 Canadian Petroleum Association (CPA) study; and (2) the devices are from the production segment rather than natural gas transmission or storage operations. The very limited data set, age of the data (20 years), and production segment operations suggest this emission factor may not represent emissions from low-bleed pneumatic devices currently in use for natural gas transmission and storage operations.</p>		

APPENDIX B

Summary of Issues from Internal Review Being Addressed by Proposed Amendments

Not all corrections and other amendments correspond directly to questions that were raised by reporters. The need for some corrections and other amendments were identified as a result of internal EPA review. Below is a summary of the issues that have been raised from the EPA's review of Subpart W of Part 98.

Changes to 98.233

- Amend Equation W-7 by adding definition for index p .
- Clarify that 98.233 (f)(1)(i)(A) is for pressure group and tubing diameter group combinations.
- Amend the definition of parameter W in equation W-8 for consistency with data reporting requirements.
- Clarify parameter SFR_p under equation W-8 for consistency with reference to equation W-33.
- Modify equation W-9 and associated parameters $Z_{p,q}$, $HR_{p,q}$, SFR_q , and V_p for consistency.
- Amend the definition of parameter W in equation W-9 for consistency with data reporting requirements.
- Clarify parameter SFR_p under equation W-9 for consistency with reference to equation W-33.
- Amend paragraph 98.233 (g) introductory text and paragraph (1) to specify that measurements are used in Methodology 1 and calculations are used for Methodology 2.
- Amend Methodology 2 in paragraph 98.233 (g)(1)(ii) to change "measured" to "calculated" well completions
- Clarify the definition for parameter FR_p of Equation W-12 to not allow use of backflow volume converted to flow rate.
- Amend paragraph 98.233(g)(3) by combining repetitive requirement from 98.233(g)(5). Subsequently, 98.233(g)(5) was deleted.
- Clarify Equation W-13 by adding definition for the parameter "p" and clarifying that emissions factor "EF_{wo}" is the volume of natural gas per workover.
- Clarify in 98.233(i) that the calculations are per "unique" physical volume.
- Modify Equation W-14A and associated parameter V for consistency.
- Clarify definition of N in equation W-14A.
- Modify equation W-14B and associated parameters V and $P_{a,b,p}$ for consistency.
- Amend equation W-14B by adding definition for index p and clarify definition for N .
- Removal of paragraph 98.233 (i)(5).
- Clarify that the emission factor "EF_i" in Equation W-15 is a population emission factor.
- Clarify in paragraph 98.233 (k) that emissions must be monitored from a vent stack connected to one or more transmission storage tank.
- Add a reference to (t), (u), and (v) to convert emissions to metric tons CO_{2e} in 98.233(k)(2).

- Amend 98.233 (n)(9) by removing requirement to report CH₄ and N₂O emissions from flares monitored by CEMS.
- Clarified the parameter “T_s” in Equation W-31 to be the average estimated time.
- Modify 98.233 (u)(2)(vi) to allow LNG import facilities to use a default composition of 95 percent methane and 1 percent carbon dioxide.
- Clarified the parameter “R_j” and “Y_j” in Equation W-39A.

Changes to 98.236

- Clarified that annual emissions must be reported by each GHG separately in the introductory paragraphs in 98.236(a) and 98.236(c).
- Clarified that the amount of CO₂ recovered from the AGR unit and transferred outside the facility must be reported under Subpart PP.
- Clarify that throughput for glycol dehydrators is “annual average daily” in 98.236 (c)(4)(ii)(C) and (D).
- Addition of average flow rate of the measured liquids unloading event for Calculation Methodology 1 reporting requirement for well venting for liquids unloading.
- Clarify that the average values of the internal casing diameter, tubing diameter, and well depth must be reported, for Calculation Methodologies 2 and 3 for well venting for liquids unloading.
- Modify 98.236 (c)(6)(i) to state that the reporting requirements are for gas well completions and workovers with hydraulic fracturing by sub-basin and well type (horizontal or vertical) combination.
- Modify 98.236 (c)(9)(i) to state that reporting is required for each vent stack.
- Removal of data reporting requirement for using CEMS to report CH₄ and N₂O from flare stacks.
- Modify paragraph 98.236 (e) to change “average” to “best available estimate” for API gravity, gas to oil ratio, and low pressure separator pressure.

Changes to 98.238

- Clarify definition for “Facility with respect to onshore petroleum and natural gas production for purposes of reporting under this subpart and for the corresponding Subpart A requirements.”