

**ENVIRONMENTAL PROTECTION  
AGENCY**

**40 CFR Part 98**

[EPA-HQ-OAR-2011-0147; FRL-9443-1]

RIN 2060-AQ85

**Mandatory Reporting of Greenhouse  
Gases**

**AGENCY:** Environmental Protection Agency (EPA).

**ACTION:** Proposed rule.

**SUMMARY:** EPA is proposing to amend specific provisions in the Mandatory Reporting of Greenhouse Gases Rule to correct certain technical and editorial errors that have been identified since promulgation and to clarify or propose amendments to certain provisions that have been the subject of questions from reporting entities. These proposed changes include additional information to clarify compliance obligations, correct data reporting elements so they more closely conform to the information used to perform emission calculations, and make other corrections and amendments. EPA has received petitions for reconsideration on some of these subparts. EPA is still considering these petitions, and the issues raised in the petitions are not discussed or addressed in this action.

**DATES:** *Comments.* Comments must be received on or before September 19, 2011.

*Public Hearing.* EPA does not plan to conduct a public hearing unless requested. To request a hearing, please contact the person listed in the following **FOR FURTHER INFORMATION CONTACT** section by August 11, 2011. If requested, the hearing will be conducted on August 19, 2011, in the Washington, DC area. EPA will provide further information about the hearing on its webpage if a hearing is requested.

**ADDRESSES:** You may submit your comments, identified by Docket ID No. EPA-HQ-OAR-2011-0147 by any of the following methods:

- *Federal eRulemaking Portal:* <http://www.regulations.gov>. Follow the online instructions for submitting comments.
- *E-mail:* [MRR\\_Corrections@epa.gov](mailto:MRR_Corrections@epa.gov). Include Docket ID No. EPA-HQ-OAR-2011-0147 [and/or RIN number] in the subject line of the message.
- *Fax:* (202) 566-9744.
- *Mail:* Environmental Protection Agency, EPA Docket Center (EPA/DC), Mailcode 2822T, Attention: Docket ID No. EPA-HQ-OAR-2011-0147, 1200 Pennsylvania Avenue, NW., Washington, DC 20004.
- *Hand/Courier Delivery:* EPA Docket Center, Public Reading Room, EPA West

Building, Room 3334, 1301 Constitution Avenue, NW., Washington, DC 20004. Such deliveries are only accepted during the Docket's normal hours of operation, and special arrangements should be made for deliveries of boxed information.

*Instructions:* Direct your comments to Docket ID No. EPA-HQ-OAR-2011-0147, 2011 Technical Corrections, Clarifying and Other Amendments to Certain Provisions of the Mandatory Reporting of Greenhouse Gases Rule. EPA's policy is that all comments received will be included in the public docket without change and may be made available online at <http://www.regulations.gov>, including any personal information provided, unless the comment includes information claimed to be confidential business information (CBI) or other information whose disclosure is restricted by statute. Do not submit information that you consider to be CBI or otherwise protected through <http://www.regulations.gov> or e-mail. The <http://www.regulations.gov> Web site is an "anonymous access" system, which means EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an e-mail comment directly to EPA without going through <http://www.regulations.gov> your e-mail address will be automatically captured and included as part of the comment that is placed in the public docket and made available on the Internet. If you submit an electronic comment, EPA recommends that you include your name and other contact information in the body of your comment and with any disk or CD-ROM you submit. If EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, EPA may not be able to consider your comment. Electronic files should avoid the use of special characters, any form of encryption, and be free of any defects or viruses.

*Docket:* All documents in the docket are listed in the <http://www.regulations.gov> index. Although listed in the index, some information is not publicly available, e.g., CBI or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, will be publicly available only in hard copy. Publicly available docket materials are available either electronically in <http://www.regulations.gov> or in hard copy at the Air Docket, EPA/DC, EPA West Building, Room 3334, 1301 Constitution Ave., NW., Washington, DC. This Docket Facility is open from 8:30 a.m.

to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566-1744, and the telephone number for the Air Docket is (202) 566-1742.

**FOR FURTHER INFORMATION CONTACT:** Carole Cook, Climate Change Division, Office of Atmospheric Programs (MC-6207J), Environmental Protection Agency, 1200 Pennsylvania Ave., NW., Washington, DC 20460; telephone number: (202) 343-9263; fax number: (202) 343-2342; e-mail address: [GHGReportingRule@epa.gov](mailto:GHGReportingRule@epa.gov). For technical information, please go to the Greenhouse Gas Reporting Rule Program Web site <http://www.epa.gov/climatechange/emissions/ghgrulemaking.html>. To submit a question, select Rule Help Center, followed by Contact Us. To obtain information about the public hearing or to register to speak at the hearing, please go to <http://www.epa.gov/climatechange/emissions/ghgrulemaking.html>. Alternatively, contact Carole Cook at 202-343-9263.

*Worldwide Web (WWW).* In addition to being available in the docket, an electronic copy of this proposal will also be available through the WWW. Following the Administrator's signature, a copy of this action will be posted on EPA's Greenhouse Gas Reporting Program Web site at <http://www.epa.gov/climatechange/emissions/ghgrulemaking.html>.

**SUPPLEMENTARY INFORMATION:**

*Additional Information on Submitting Comments:* To expedite review of your comments by Agency staff, you are encouraged to send a separate copy of your comments, in addition to the copy you submit to the official docket, to Carole Cook, U.S. EPA, Office of Atmospheric Programs, Climate Change Division, Mail Code 6207-J, Washington, DC 20460, telephone (202) 343-9263, e-mail address: [GHGReportingRule@epa.gov](mailto:GHGReportingRule@epa.gov).

*Regulated Entities.* The Administrator determined that this action is subject to the provisions of Clean Air Act (CAA) section 307(d). See CAA section 307(d)(1)(V) (the provisions of section 307(d) apply to "such other actions as the Administrator may determine"). These are proposed amendments to existing regulations. If finalized, these amended regulations would affect owners or operators of certain industrial gas suppliers and direct emitters of GHGs. Regulated categories and examples of affected entities include those listed in Table 1 of this preamble:

TABLE 1—EXAMPLES OF AFFECTED ENTITIES BY CATEGORY

Category	NAICS	Examples of affected facilities
Petroleum and Natural Gas Systems .....	486210	Pipeline transportation of natural gas.
	221210	Natural gas distribution facilities.
	211	Extractors of crude petroleum and natural gas.
	211112	Natural gas liquid extraction facilities.
Underground Coal Mines .....	212113	Underground anthracite coal mining operations.
	212112	Underground bituminous coal mining operations.
Electrical Transmission and Distribution Equipment Use.	221121	Electric bulk power transmission and control facilities.
Industrial Wastewater Treatment .....	322110	Pulp mills.
	322121	Paper mills.
	322122	Newsprint mills
	322130	Paperboard mills.
	311611	Meat processing facilities.
	311411	Frozen fruit, juice, and vegetable manufacturing facilities.
	311421	Fruit and vegetable canning facilities.
	325193	Ethanol manufacturing facilities.
	324110	Petroleum refineries.
Suppliers of Industrial GHGs .....	325120	Industrial gas production facilities.
Geologic Sequestration of Carbon Dioxide .....	N/A	CO <sub>2</sub> geologic sequestration projects
Industrial Waste Landfills .....	562212	Solid waste landfills.
	322110	Pulp mills.
	322121	Paper mills.
	322122	Newsprint mills.
	322130	Paperboard mills.
	311611	Meat processing facilities.
	311411	Frozen fruit, juice, and vegetable manufacturing facilities.
	311421	Fruit and vegetable canning facilities.
	221320	Sewage treatment facilities.

Table 1 of this preamble is not intended to be exhaustive, but rather lists the types of facilities or suppliers that EPA is now aware could be potentially affected by the reporting requirements. Other types of facilities and suppliers than those listed in the table could also be subject to reporting requirements. To determine whether you are affected by this action, you should carefully examine the applicability criteria found in 40 CFR part 98, subpart A or the relevant criteria in the sections related to suppliers and direct emitters of GHGs. If you have questions regarding the applicability of this action to a particular facility or supplier, consult the person listed in the preceding **FOR FURTHER INFORMATION CONTACT** Section.

*Acronyms and Abbreviations.* The following acronyms and abbreviations are used in this document.

acf actual cubic feet.  
 AGR acid gas removal.  
 ASTM American Society for Testing and Materials.  
 BAMM best available monitoring methods.  
 CAA Clean Air Act.  
 CBI confidential business information.  
 CEMS continuous emissions monitoring system.  
 CFC chlorofluorocarbon.  
 CFR Code of Federal Regulations.  
 CH<sub>4</sub> methane.  
 CO<sub>2</sub> carbon dioxide.  
 DOC degradable organic carbon.  
 EF emission factor.

e-GGRT electronic-GHG Reporting Tool.  
 EPA U.S. Environmental Protection Agency.  
 FR **Federal Register**.  
 GHG greenhouse gas.  
 GHGRP Greenhouse Gas Reporting Program.  
 HCFC hydrochlorofluorocarbon.  
 kg kilograms.  
 kg/ft<sup>3</sup> kilograms per cubic foot.  
 mcf methane correction factor.  
 MMscf million standard cubic feet.  
 MRV monitoring, reporting and verification.  
 MSHA Mine Safety and Health Administration.  
 MtCO<sub>2</sub>e metric tons carbon dioxide equivalent.  
 N<sub>2</sub>O nitrous oxide.  
 NAICS North American Industry Classification System.  
 NOAA National Oceanic and Atmospheric Administration.  
 NTTAA National Technology Transfer and Advancement Act.  
 OMB Office of Management and Budget.  
 PFCs perfluorocarbons.  
 psia pounds per square inch absolute.  
 RFA Regulatory Flexibility Act.  
 SF<sub>6</sub> sulfur hexafluoride.  
 U.S. United States.  
 UMRA Unfunded Mandates Reform Act of 1995.

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## I. Background

### A. How is this preamble organized?

The first section of this preamble contains the basic background information about the origin of these proposed rule amendments and request for public comment. This section also discusses EPA's use of our legal authority under the Clean Air Act to collect data under the Mandatory Reporting of Greenhouse Gases (GHG reporting) rule.

The second section of this preamble describes in detail the changes that are being proposed to correct technical errors, to provide clarification, or propose amendments to address implementation issues identified by EPA and others. This section also presents EPA's rationale for the proposed changes and identifies issues on which EPA is particularly interested in receiving public comments.

Finally, the last (third) section of the preamble discusses the various statutory and executive order requirements applicable to this proposed rulemaking.

### B. Background on This Action

The 2009 final GHG reporting rule (2009 final rule) was signed by EPA Administrator Lisa Jackson on September 22, 2009 and published in the **Federal Register** on October 30, 2009 (74 FR 56260, October 30, 2009). The 2009 final rule, which became effective on December 29, 2009, includes reporting of GHGs from various facilities and suppliers, consistent with the 2008 Consolidated Appropriations Act.<sup>1</sup> Subsequent notices were published in 2010 finalizing the requirements for subparts FF, II, and TT (75 FR 39736, July 12, 2010), subpart W (75 FR 74458, November 30, 2010), subpart DD (75 FR 74774, December 1, 2010) and subpart RR (75 FR 75060, December 1, 2010). Subpart OO, which was promulgated as part of the 2009 final rule was also revised in 2010 (75 FR 79092, December 17, 2010). The source categories in 40 CFR part 98 cover approximately 85–90 percent of U.S. GHG emissions through reporting by direct emitters, as well as suppliers of certain products that would result in GHG emission when released, used, or oxidized, and those that geologically sequester or otherwise inject carbon dioxide (CO<sub>2</sub>) underground.

### C. Legal Authority

EPA is proposing these rule amendments under its existing CAA

authority, specifically authorities provided in CAA section 114.

As stated in the preamble to the 2009 final rule (74 FR 56260) and the Response to Comments on the Proposed Rule, Volume 9, Legal Issues, CAA section 114 provides EPA broad authority to require the information proposed to be gathered by this rule because such data would inform and are relevant to EPA's carrying out a wide variety of CAA provisions. As discussed in the preamble to the initial proposed rule (74 FR 16448, April 10, 2009), CAA section 114(a)(1) authorizes the Administrator to require emissions sources, persons subject to the CAA, manufacturers of control or process equipment, or persons whom the Administrator believes may have necessary information to monitor and report emissions and provide such other information the Administrator requests for the purposes of carrying out any provision of the CAA. For further information about EPA's legal authority, see the preambles to the 2009 proposed and final rules and EPA's Response to Comments, Volume 9.

### D. How would these amendments apply to 2012 reports?

EPA is planning to address the comments on these proposed amendments and publish the final amendments before the end of 2011. Therefore, reporters would be expected to calculate emissions and other relevant data for the reports that are submitted in 2012 using 40 CFR part 98 as amended by this proposed action. We have determined that it is feasible for the sources to implement these changes for the 2011 reporting year because the revisions primarily provide additional clarifications regarding the existing regulatory requirements, do not change the type of information that must be collected, and do not materially affect how emissions are calculated.

For example, EPA is proposing several technical clarifications and amendments to subpart A to address issues raised by reporters through questions to the hotline in late 2010 and early 2011, as well as those identified by EPA. For additional background information on the questions raised, please refer to the Technical Support Document for the 2011 Technical Corrections, Clarifying and Other Amendments to Certain Provisions of the Mandatory Reporting of Greenhouse Gases Rule proposal available in the docket to this rulemaking (EPA–HQ–OAR–2011–0147). For instance, we are proposing to change the threshold for underground coal mines to include only those that liberate 36,500,000 actual

cubic feet (acf) of methane (CH<sub>4</sub>) or more per year (equivalent to 100,000 acf of CH<sub>4</sub> or more per day). If the current regulatory threshold is retained, all mines that are currently subject to quarterly or more frequent sampling by Mine Safety and Health Administration (MSHA) would be required to report. Given that the original requirements were based on an incorrect assumption regarding the number of mines that MSHA samples, we are proposing a new threshold that will remove reporting requirements for approximately 500 mines (see relevant discussion in Section II.C of this preamble). We are also proposing provisions to clarify the time period during which information must be submitted to EPA and to clarify which information may be submitted through the electronic Greenhouse Gas Reporting Tool (e-GGRT) and which must be mailed to the Director of the Climate Change Division. We are also proposing a revision to the definition of "supplier" to be consistent with changes made to the rule during 2010. These changes impose no additional burden for facilities, and could be readily implemented for the 2011 reporting year.

Many proposed revisions provide additional information to provide clarity on existing requirements. For example, in subpart W (Petroleum and Natural Gas Systems) we are providing additional clarity on the methodological options for calculating emissions from acid gas removal units and emissions from well venting for liquids unloading. In subpart FF (Underground Coal Mines) we are proposing to clarify use of MSHA data to calculate emissions. While MSHA data may be used to collect data for volume and concentration of methane, it does not provide temperature and pressure data; therefore, we are proposing that measurements of temperature must be made at the same time as MSHA measurements for volume and concentration of methane and that for pressure, facilities must use either a measured value or the average annual barometric pressure from the nearest National Oceanic and Atmospheric Administration (NOAA) weather service station. This proposed clarification is consistent with clarifications EPA has issued in response to industry questions and does not change the rule requirements for facilities collecting data in 2011 because the requirements to collect temperature and pressure data were already clear in 40 CFR 98.324(b)(1). In subpart RR, clarifying text is proposed in 40 CFR 98.443(d) to ensure that facilities account for CO<sub>2</sub>

<sup>1</sup> Consolidated Appropriations Act, 2008, Public Law 110–161, 121 Stat. 1844, 2128.

entrained in produced fluids from oil or gas production wells or from other fluid wells that are not processed through a gas-liquid separator. Although we intended that CO<sub>2</sub> content in all produced liquids would be determined (see Section II.B.4 of the preamble to the final subpart RR rule (75 FR 75065, December 1, 2010)), the text in 40 CFR 98.443(d) and associated equations were based on measurements that did not include fluids removed without the use of a separator, such as water removed for pressure relief. Therefore, the clarifying text does not change the rule requirements for facilities collecting data in 2011.

Other proposed amendments provide additional clarity to the data reporting elements. For example, in subpart II (Industrial Wastewater Treatment) we are proposing to clarify what is meant by weekly sampling in 40 CFR 98.353(c) and (d); the proposed revisions would clarify that reporters that sample only once per week must sample more than three days apart.

For some subparts, we are proposing amendments that would provide additional flexibility to the sources. Thus, while they would be free to use the amended regulations once final, facilities are not required to follow the amendments for 2011 data collection. For example, in subpart TT (Industrial Waste Landfills), facilities are provided an additional approach for determining the volatile solids concentration or the waste-specific degradable organic carbon (DOC) values for historically disposed streams. The July 12, 2010 final rule had no provisions by which waste streams that were not disposed of in the first reporting year could be assessed. These waste streams were required to use the default DOC values, which have a high degree of uncertainty. The proposed revision allows owners and operators of industrial waste landfills to develop more accurate values for volatile solids concentration and site-specific DOC. With these proposed amendments, these facilities would have the option, but not be required, to use the newly proposed option for the reports submitted to EPA in 2012 and thereafter.

EPA is also proposing corrections to terms and definitions in certain equations. For example, in subpart TT (Industrial Waste Landfill), we are proposing to delete Equation TT-7 and amend Equation TT-8, which were incorrectly based on the assumption that the volatile solids concentration was expected to have units of mass of volatile solids per mass of (wet) waste. We are correcting these equations per Standard Method 2540C "Total, Fixed,

and Volatile Solids in Solid and Semisolid Samples," in which the volatile solids concentration is determined on a dry basis. These clarifications do not result in additional requirements; therefore, EPA has concluded that reporters subject to the subparts that would be amended by this proposed action can follow the rule, as amended, in submitting their reports in 2012 and thereafter.

Finally, EPA is proposing other technical corrections (e.g., correcting cross references) that have no impact on facilities' data collection efforts in 2011.

In summary, these amendments would not require any additional monitoring or information collection above what was already included in 40 CFR part 98. Therefore, we expect that sources can use the same information that they have been collecting under 40 CFR part 98 for each subpart to calculate and report GHG emissions for 2011 and submit reports in 2012 under the amended subparts.

EPA generally seeks comment on the conclusion that it is appropriate to implement these amendments and incorporate the requirements in the data reported to EPA in 2012. Further, we seek comment on whether there are specific subparts and specific proposed changes where this timeline may not be feasible or appropriate due to the nature of the proposed changes or the way in which data have been collected thus far in 2011. We request that commenters provide specific examples of how the proposed implementation schedule would or would not work.

## II. Technical Corrections and Other Amendments

Following promulgation of subparts A and OO on October 30, 2009, subparts FF, II, and TT on July 12, 2010, subpart W on November 30, 2010, and subparts DD and RR on December 1, 2010, EPA has identified errors in the regulatory language that we are now proposing to correct. These errors were identified as a result of working with affected industries to implement these subparts. We have also identified certain rule provisions that should be amended to provide greater clarity. The amendments we are now proposing include the following types of changes:

- Changes to correct cross references within and between subparts.
- Additional information to better or more fully understand compliance obligations in a specific provision, such as the reference to a standardized method that must be followed.
- Amendments to certain equations to better reflect actual operating conditions.

- Corrections to terms and definitions in certain equations.

- Corrections to data reporting requirements so that they more closely conform to the information used to perform emission calculations.

- Other amendments related to certain issues identified as a result of working with the affected sources during rule implementation and outreach.

We are seeking public comment only on the issues specifically identified in this notice for the identified subparts. We will not respond to any comments addressing other aspects of 40 CFR part 98.

### A. Subpart A—General Provisions

EPA is proposing several technical clarifications and amendments to subpart A to address issues raised by reporters and identified by EPA during the first year of implementation of the GHG Reporting Program (GHGRP), as well as to clarify terminology to ensure consistency across all subparts. In addition, a number of minor amendments are proposed to ensure that the General Provisions appropriately reflect the incorporation of the additional subparts into the GHGRP that were finalized in 2010.

*Threshold for Electrical Transmission and Distribution Equipment Use.* We are proposing to amend Table A-3 in the General Provisions to clarify applicability of the rule for Electrical Transmission and Distribution Equipment Use (subpart DD). The final subpart DD rule (December 1, 2010; 75 FR 74774) specifies at § 98.301 that reporting is required for an electric power system only if the total nameplate capacity of SF<sub>6</sub> and PFC containing equipment located within the electric power system, when added to the total nameplate capacity of SF<sub>6</sub> and PFC containing equipment that is not located within the electric power system but is under common ownership or control, exceeds 17,820 pounds. That section of the rule also specifies that a facility other than an electric power system that is subject to part 98 because of emissions from another source category is only required to report emissions under subpart DD if the total nameplate capacity of SF<sub>6</sub> and PFC containing equipment located within that facility exceeds 17,820 pounds. The final rule, however, does not include the 17,820 pound capacity threshold in Table A-3. Some potential reporters have questioned if this omission means that all facilities with electric power equipment must submit an annual report, even if they are below the capacity threshold and are not

otherwise required to report under any other provisions of part 98. This interpretation is clearly not the intent of the rule. The regulatory text in the final rule can and should be interpreted to mean that a facility is required to submit an annual report only if the capacity threshold is exceeded. This interpretation is clear from the preamble to the proposal (74 FR 16609) as well as the final rule (75 FR 74774)). However, we are proposing to revise Table A-3 to insert the capacity threshold language of § 98.301 to make the rule clearer and less subject to misinterpretation. Because the test for whether a facility meets the numerical threshold differs depending on the type of facility, we are including a reference to § 98.301. Therefore, we are revising the Table A-3 entry for subpart DD to read as follows: Electrical transmission and distribution use at facilities where the total nameplate capacity of SF<sub>6</sub> and PFC containing equipment exceeds 17,820 pounds, as determined under § 98.301 (subpart DD).

**Threshold for Underground Coal Mines.** We are proposing to change the threshold for underground coal mines to include only those that have ventilation emissions of 36,500,000 acf of CH<sub>4</sub> or more per year. For a full description of this proposed change, please refer to the relevant discussion under subpart FF of this action.

**Computation of Time.** EPA is proposing to add a provision to 40 CFR 98.3(b) to allow information, including but not limited to, the annual GHG report and any subsequent re-submissions, the certificate of representation, and requests to use best available monitoring methods, to be submitted to EPA on the next business day in the event that a regulatory deadline falls on a weekend or a Federal holiday. The proposed language is consistent with a similar provision under the Acid Rain Program (40 CFR 72.11) and will provide all reasonable flexibilities for submitting data without compromising data quality.

**2012 Reporting Deadline.** We are proposing a one-time extension of the 2012 reporting deadline for facilities and suppliers subject to source categories for which data collection began January 1, 2011 (referred to below as the “new 2011 reporting year source categories”).<sup>2</sup> A deadline extension from

March 31, 2012 to September 28, 2012 would apply only to reporting of data elements under the following source categories: Electronics Manufacturing (subpart I), Fluorinated Gas Production (subpart L), Magnesium Production (subpart T), Petroleum and Natural Gas Systems (subpart W), Use of Electric Transmission and Distribution Equipment (subpart DD), Underground Coal Mines (subpart FF), Industrial Wastewater Treatment (subpart II), Imports and Exports of Equipment Pre-charged with Fluorinated GHGs or Containing Fluorinated GHGs in Closed-cell Foams (subpart QQ), Geologic Sequestration of Carbon Dioxide (subpart RR), Manufacture of Electric Transmission and Distribution (subpart SS), Industrial Waste Landfills (subpart TT), and Injection of Carbon Dioxide (subpart UU).

All facilities and suppliers subject to the GHGRP, including facilities and suppliers that include the source categories listed above, would still be required to report their GHG information for all other subparts by March 31, 2012. For example, a facility subject to report GHG information under subparts C, W, and PP would still be required to report GHG information for subparts C and PP by March 31, 2012, but would not be required to submit the required data reporting elements under subpart W until September 28, 2012.

We are proposing this change to the 2012 reporting deadline for the new 2011 reporting year source categories in order to allow sufficient time for development, and more importantly stakeholder testing, of the electronic-GHG Reporting Tool (e-GGRT). Stakeholder testing provides an opportunity for EPA to receive feedback from reporters and other interested stakeholders to enable EPA to test the effectiveness of the user interface of e-GGRT, correct any problems in advance of the reporting deadline, and ultimately ensure that the data received under the program are of the highest quality. Stakeholder testing of the electronic reporting tool for the new 2011 reporting year source categories is particularly important given the large number of reporters affected by these new categories (more than one quarter of all reporters are estimated to be required to report under these new subparts).

Based on the discussion above, we are seeking comment on whether a six-month extension of the 2012 reporting deadline for the new 2011 reporting year source categories to September 28, 2012, would be appropriate. Facilities and suppliers subject to the rule would still be required to report all other

required data reporting elements by March 31, 2012, but would not report information related to the new 2011 reporting year source categories until September 28, 2012.

**Reporting on use of Best Available Monitoring Methods (BAMM).** We are proposing to amend 40 CFR 98.3(c)(7) to remove the phrase “according to paragraph (d) of this section” thereby requiring all facilities and suppliers that use BAMM to provide a brief description of each “best available monitoring method” used, the parameter measured using the method, and the time period during which the “best available monitoring method” was used, if applicable. This reporting requirement was applicable to all facilities and suppliers using BAMM in the 2009 final rule. Most of the subparts promulgated in 2010 (subparts T, DD, FF, II, QQ, RR, SS, TT, and UU) directly referred back to the procedures in 40 CFR 98.3(d), and therefore the requirement to report basic information on BAMM is required. Through this amendment, we are clarifying that this basic information must be reported for all subparts, including subparts L (Fluorinated Gas Production) and W (Petroleum and Natural Gas Systems). This does not impact the requirements of subpart I (Electronics Manufacturing), which already directly include this reporting requirement in the data reporting requirements of that subpart.

#### Definitions

**Blowdown vent stack.** We are proposing to amend the definition of blowdown vent stack emissions to add the phrase “emissions from emergency events are not included.” EPA is proposing to make this change to promote better consistency with provisions in subpart C, which exempted emissions from emergency generators and equipment from being included in the GHG emissions calculations.

**Supplier.** Based on changes made to the rule during 2010, the definition of supplier does not adequately represent the breadth of subparts covered under the rule. EPA is proposing to change the definition of supplier in 40 CFR 98.6 so it specifically refers to those source categories listed in Table A-5 to subpart A of part 98, and is as described in the definition of the source category in the applicable subparts.

The proposed amendment is necessary because suppliers are currently defined as suppliers of fossil fuels and industrial GHGs. However, during 2010, EPA changed the definition of fossil fuels in a rulemaking (75 FR 79092) that could be wrongly

<sup>2</sup> There was a separate one-time extension of the reporting deadline for facilities and suppliers first required to report GHG information to EPA in 2011, for data collected during 2010 (76 FR 14812). The deadline extension in this proposal only applies to the reporting of information from those source categories for which data collection began in 2011 and for which data are to be reported in 2012.

interpreted to exclude some suppliers that are clearly subject to the rule. In the 2009 final rule, fossil fuel was defined in 40 CFR 98.6 as meaning natural gas, petroleum, coal, or any form of solid, liquid, or gaseous fuel derived from such material, including for example, consumer products that are derived from such materials and are combusted. Using this definition, suppliers of fossil fuel-based products were covered by subparts MM and NN regardless of the product end-use. This interpretation is clear from the preamble to the 2009 final rule (74 FR 56260). However, in the subsequent rulemaking (75 FR 79092) EPA modified the definition of fossil fuel to read natural gas, petroleum, coal, or any form of solid, liquid, or gaseous fuel derived from such material, for purpose of creating useful heat. We were clear in the preamble to that final rule that the change was not intended to have any impact on coverage of GHGs under the GHGRP (see 75 FR 79104). Nevertheless, referring to only suppliers of fossil fuels could now wrongly be interpreted so as to exclude some coverage under subparts MM and NN.

In addition, we added a new source category to the rule called Importers and Exporters of Fluorinated GHGs Contained in Pre-charged Equipment or Closed-cell Foams (subpart QQ, 75 FR 74774). Although one could interpret the existing definition to include suppliers of fluorinated GHGs in bulk and in products, the proposed amendment further clarifies that suppliers include all the relevant source categories included in Table A-5.

We are also proposing a harmonizing change in 40 CFR 98.1(a)(1) to remove the terms “fossil fuel” and “industrial greenhouse gas” before the term “supplier.”

*Submission of reports and other information to EPA.* There were some questions raised in the 2009 final rule about where certain communications should be directed, whether electronically through the electronic greenhouse gas reporting tool (40 CFR 98.5) or through the mail with an attention to the Director of the Climate Change Division (40 CFR 98.9). 40 CFR 98.5 reads that each GHG report and certificate of representation for a facility or supplier must be submitted electronically in a format specified by the Administrator. 40 CFR 98.9 was intended to provide a mailing address for all other communications under the program, however, the regulatory language indicated that the mailing address was for all requests, notifications, and communications to the Administrator other than submittal

of the annual GHG report. This raised a question as to whether the certificate of representation could be submitted through the mail.

To address this potential source of confusion, we are clarifying that the annual GHG report, the certificate of representation, and all other requests, notifications, or communications that can be submitted through e-GGRT, must be submitted through e-GGRT. All other requests, notifications, or communications to the Administrator pursuant to this part shall be submitted through the mail to the Director of the Climate Change Division.

*Other Technical Corrections.* We are proposing to amend 40 CFR 98.2(d) and (e) to remove references to paragraphs 40 CFR 98.2(a)(4)(i) and (a)(4)(ii), respectively, which were removed when we finalized amendments during 2010 to consolidate the lists of source categories covered into tables. The correct references for both paragraphs should have been to 40 CFR 98.2(a)(4). In those same paragraphs we are clarifying that the applicability determination for importers should be assessed separately from the applicability determination for exporters. In other words, the emissions from the quantity of GHGs imported should be calculated for comparison to the 25,000 metric tons CO<sub>2</sub>e threshold and separately the quantity of GHGs exported should be calculated for comparison to the 25,000 metric tons CO<sub>2</sub>e. Based on questions received from reporters during the 2010 reporting year, it was unclear if the quantity of imports and exports should be assessed separately, added together, or the net imports minus exports calculated for comparison to the threshold. Finally, we are clarifying in Table A-5 that coverage and the applicability determination for importers and exporters under subpart MM includes suppliers of natural gas liquids in addition to suppliers of petroleum products. The inclusion of natural gas liquids suppliers was clear in 40 CFR 98.2(a)(4) and subpart MM (40 CFR 98.390), however, it was inadvertently omitted from Table A-5.

We are proposing to amend 40 CFR 98.2(i)(3) to add a date by which owners and operators must notify EPA that they no longer need to submit an annual GHG report because their operations have changed such that all applicable GHG-emitting processes and operations cease to operate. 40 CFR 98.2(i) provides three instances where facilities or suppliers no longer need to report to EPA. In instances where facilities or suppliers report less than 25,000 metric tons carbon dioxide equivalent (mtCO<sub>2</sub>e) per year for 5 years, or less

than 15,000 mtCO<sub>2</sub>e for 3 years, they are required to notify EPA by March 31 of the following year that they are no longer to report for the year after the year in which these conditions have been met. Similarly, the owner or operator is exempt from reporting in the years following the year in which cessation of such operations occurs, provided that the owner or operator submits a notification to the Administrator. However, the rule does not provide a date by which such notification be made. EPA is proposing that, similar to the requirements in 40 CFR 98.2(i)(1) and (i)(2), owners or operators notify EPA by March 31 of the year following the reporting year in which such conditions have been met.

In 40 CFR 98.3(c)(10) and in the definition of United State parent company(s) in 40 CFR 98.6, we are proposing to replace the term “reporting entity” with the term “facility or supplier.” Reporting entity has not typically been used in the GHGRP and for consistency across the individual subparts of the rule, we are proposing to use the term “facility or supplier” which in turn clarifies that the obligation is on the owner or operator of any such facility or supplier. This is consistent with the preamble to the rule that amended 40 CFR part 98 with 40 CFR 98.3(c)(10), in which it is clear that “reporting entity” means “facility or supplier” (see, for example, 75 FR 57676).

To address several requests for clarification received on the recordkeeping requirements, we are proposing to clarify that the 3-year requirement for retention of records starts from the date of submission of the annual GHG report for the reporting year in which the record was generated. This is as opposed to having the 3-year clock start on the day that the record was generated. The proposal, which is consistent with the Acid Rain Program, is in recognition of the fact that common practice is to retain all of the records for a single reporting year in a readily retrievable format, regardless if the record was generated on January 1st or December 31st of that reporting year. We are therefore proposing that the records be retained for 3 years from the date of submission of the applicable annual GHG report.

In 40 CFR 98.3(c)(5)(ii) we are proposing to replace the use of the term “emissions” with “quantities” when referring to the information reported under industrial GHG suppliers. This is consistent with efforts throughout the GHG Reporting Program to clarify that information reported for supplier categories do not necessarily reflect

emissions to the atmosphere, but rather “quantities” that may be released if all of the supply were combusted or released.

We are also proposing to correct an incorrect cross reference in 40 CFR 98.4(m)(4) from (m)(2)(iv)(A) to (m)(2)(v)(A).

#### *B. Subpart W—Petroleum and Natural Gas Systems*

EPA is proposing several technical clarifications and amendments to subpart W to address issues raised during the first year of promulgation of the rule, as well as clarifications to specified provisions in the rule to ensure consistency across all subparts. In addition, several technical corrections are proposed to clarify provisions that were either erroneous or unclear to reporters.

**Definitions.** EPA is proposing to amend the definition for gas well in 40 CFR 98.238. The definition of gas well that was finalized in the rule, posed the question of whether or not gas wells that included any hydrocarbon condensate were also considered gas wells. The amendment clarifies the definition for gas well by stating that it includes gas wells that also produce natural gas including condensate.

**Threshold Clarifications.** EPA is broadly including clarification to several throughput thresholds in subpart W in response to clarifications sought by reporters subject to the rule. We are proposing to amend the threshold in the definition of the source category for the onshore natural gas processing industry segment in 40 CFR 98.230(a)(2). This definition includes a threshold provision, which states that all processing facilities that do not fractionate with a throughput per day of 25 million standard cubic feet (MMscf) or greater are covered under the rule. Without a clarification on how the 25 MMscf per day is to be determined, this provision resulted in confusion for reporters. Thus, we propose to amend the definition to state that the 25 MMscf per day throughput threshold is based on an annual average throughput that the reporter would use to determine if they are covered under this definition.

Similarly, we are proposing to clarify that the throughput threshold for glycol dehydrators (40 CFR 98.233(e)(1) and (e)(2)) and onshore production storage tanks (40 CFR 98.233(j)(1),(j)(2),(j)(3) and (j)(4)) are also based on annual average throughput. These proposed amendments are described further in the Calculating Greenhouse Gas Emissions section below.

**Greenhouse Gases to Report.** We are proposing to clarify in 40 CFR 98.232(d)

that the greenhouse gases to be reported under the natural gas processing industry segment include nitrous oxide (N<sub>2</sub>O) emissions and not just CO<sub>2</sub> and CH<sub>4</sub> emissions. This proposed amendment will make 40 CFR 98.232(d) consistent with other provisions in the rule related to calculating GHG emissions from flare stacks. The rule in 40 CFR 98.232(j) clearly states that you are required to report CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O emissions for all flare stacks in all applicable industry segments and flare stacks are included to be reported in natural gas processing facilities (98.232(d)(6)). Finally, the calculation methodology for flare stack emissions includes the method for quantifying N<sub>2</sub>O emissions from these stacks (See section 98.233(n)(8)). This proposed clarification avoids confusion as to whether N<sub>2</sub>O emissions, which typically result from flaring activities, would need to be reported under this industry segment.

In addition, we are proposing to clarify in 40 CFR 98.232(i) that CO<sub>2</sub> and CH<sub>4</sub> emissions are to be reported from the natural gas distribution industry segment. This clarification was necessary to ensure that the affected reporters are aware that these GHG's are to be reported from this industry segment.

**Calculating Greenhouse Gas Emissions.** We are proposing several clarifications, corrections, and amendments throughout 40 CFR 98.233.

First, we are proposing to amend the definition for GHG<sub>i</sub> of Equation W-1 in 40 CFR 98.233(a) which is used for calculating GHG emissions from natural gas pneumatic device venting. In specific, the definition for the parameter GHG<sub>i</sub> in Equation W-1 was incorrect in that it inferred that it applied to facilities listed in 40 CFR 98.230(a)(3) through (a)(8) when it actually only applies to the onshore production, natural gas transmission, and underground natural gas storage industry segments of subpart W. In addition, we are proposing to further amend the definition for parameter GHG<sub>i</sub> in Equation W-1 to clarify that GHG<sub>i</sub> should equal 0.952 for CH<sub>4</sub> and 1 X 10<sup>-3</sup> for CO<sub>2</sub> for facilities in 40 CFR 98.230(a)(4) and (a)(5). Previously, this equation did not include any clarification of what the parameter GHG<sub>i</sub> would be for methane and carbon dioxide and as a result confusion arose as to what values should be used for the natural gas transmission and underground natural gas storage industry segments. Further, for both Equation W-1, and W-2, of 40 CFR 98.233, we are proposing to amend the definition for the parameter GHG<sub>i</sub> to

include a reference to 40 CFR 98.233(u)(2)(i) to clarify how and at what frequency GHG<sub>i</sub> is to be determined for produced natural gas from the onshore production industry segment. We are proposing these amendments to Equations W-1 and W-2, to clarify specific aspects of the parameter GHG<sub>i</sub> and how it applies to applicable industry segments and how it is to be determined to address lack of clarity on these aspects of the equation.

Next, we are proposing amendments to 40 CFR 98.233(d) to clarify how the four different methods are to be used for determining GHG emissions from acid gas removal (AGR) vents. In many cases a reporter may have both a continuous emissions monitoring system (CEMS) or a vent meter available at their facility, and when reviewing the methods in 40 CFR 98.233(d) in the final rule, the reporter would not be able to easily determine which method would apply when certain technologies are available. Thus, we are proposing to amend 40 CFR 98.233(d)(2), (3) and (4) to clarify that if a facility has a vent meter but no CEMs available for determining the CO<sub>2</sub> emissions from AGR units then they would use Calculation Methodology 2 and if a facility has neither a CEMs in place or a vent meter in place, they have the option of using either Calculation Methodology 3 or 4 of 40 CFR 98.233(d).

Next, we are proposing several amendments to 40 CFR 98.233(e) for calculating emissions from dehydrator vents. First, we are proposing to include minor non-substantive revisions to the citations in 40 CFR 98.233(e) and (e)(1)(xi)(C). Next we are proposing to fix an erroneous citation in 40 CFR 98.233(e)(1)(xi) to correctly reference 40 CFR 98.233(e)(1)(xi) instead of 40 CFR 98.233(e)(2)(xi). Finally, we are proposing to amend 40 CFR 98.233(e)(1) and (e)(2) to clarify that the throughput threshold of 0.4 million standard cubic feet per day is to be determined using an annual average daily throughput. We are proposing to include this particular amendment to clarify to reporters how this throughput threshold is to be determined.

We are proposing to amend engineering Equation W-8, which is used to calculate emissions from well venting for liquids unloading. First, we are proposing to amend the first sentence in 40 CFR 98.233(f)(2) to state that Calculation Methodology 2 is to be used to calculate the total emissions for well venting for liquids unloading whereas the rule previously stated that Calculation Methodology 2 was to be used to calculate emissions from each well venting for liquids unloading event. This clarification is in line with

the equation in that the emissions from well venting for liquids unloading that have occurred in the year of data collection are to be summed and an annual value would result for all wells, as opposed to each well separately.

We are proposing to amend Equation W-13 to include corrections and clarifications to the parameter definitions. First we are proposing to correct parameter  $E_{a,n}$ ,  $EF_{wo}$ , and  $V_f$  to state that they represent standard conditions and not actual conditions. Secondly, we are proposing a correction to the emission factor (EF) value in  $EF_{wo}$  that was based on actual conditions and should have been in standard conditions. This proposed change would result in the emissions factor value adjustment  $EF_{wo} = 2,454$  to 3,114 standard cubic feet per workover. Next, we are proposing to revise the definition of  $E_{a,n}$  to  $E_{s,n}$  to clarify that the annual natural gas emissions calculated are from a single gas well venting event and at standard conditions. Previously the rule stated that the  $E_{a,n}$  (now referred to as the  $E_{s,n}$ ), represents emissions from gas well venting, which resulted in confusion as to whether this equation was to apply for gas well venting in previous years or to more than one gas well venting during the year of data collection. Finally, we are proposing to revise 40 CFR 98.233(h)(1). The rule states that the resulting emissions from Equation W-13 are to be converted into standard conditions. However, this should not be the case because Equation W-13 would already result in emissions in standard condition. As a result, we are proposing to include language in 40 CFR 98.233(h)(1) that would reference paragraphs in subpart W that will convert the emissions from Equation W-13 into GHG volumetric and mass emissions.

In Equation W-14 used for determining blowdown vent stacks emissions, we are proposing to clarify that the parameter  $V_v$  is the actual physical volume of the blowdown equipment and not the gas volume. It was always EPA's intent that the physical volume between isolation valves be considered against the 50 standard cubic feet threshold for blowdown vent stacks.<sup>3</sup> EPA is also proposing to clarify the reporting requirements for blowdown vent stacks by stating that emissions are calculated per unique volume type and not

equipment type. Equation W-14 in 40 CFR 98.233(i) determines emissions on a unique volume basis; therefore, emissions should be reported as such.

In addition, we are proposing to make amendments to equations and parameters dependant on  $CH_4$  and  $CO_2$  composition by making clarifications to the parameter, GHGs used to convert whole gas, total hydrocarbon, or methane emissions into volumetric or mass  $CO_2$ , and  $CH_4$  emissions in Equations W-1, W-2, W-30, and W-31.

In 40 CFR 98.233(j) we are proposing to clarify that the throughput threshold referenced in Calculation Methodologies 1-4 is based on an annual average daily throughput of oil, whereas the rule gave no clarification as to what basis the oil throughput was based on, resulting in many questions from affected owners and operators on how this throughput threshold was to be determined. We are also proposing to correct an erroneous citation in 40 CFR 98.234(j)(1)(vii) and 40 CFR 98.233(j)(2), which referenced citations that do not exist. In Equation W-15, where volumetric GHG emissions are determined from onshore production storage tanks, we are proposing to revise the equation by including a multiplier so the resulting emissions would be in the correct units. In addition, we are proposing to amend the definition for the  $EF_f$  and count parameters to clarify that these parameters must be used for both gas-liquid separators with throughput less than 10 barrels per day and wells with throughput less than 10 barrels per day sending liquids straight to a tank without going through any separator. The definition to equation W-15 in the 2010 final rule could have been misinterpreted to apply only to instances where there was a separator at the well. The proposed clarification makes the definitions to Equation W-15 consistent with the introduction to 40 CFR 98.233(j)(5).

In Equation W-16, we are proposing to amend the definition for the parameter  $E_n$  by first correcting the citation that erroneously included 40 CFR 98.233(j)(3), which should not have been included because it references a methodology that is specific for wells that flow directly to storage tanks bypassing a wellhead separator. In addition, we are proposing to amend the definition for  $E_n$  by including a conversion factor that would result in the emissions being determined on a yearly basis as opposed to an hourly basis. In addition, we are proposing to delete the parameter  $E_r$  in the equation as it is being accounted for in the revised equation and is no longer necessary.

In 40 CFR 98.233(k) we are proposing the inclusion of minor revisions to 40 CFR 98.233(k)(2) and (k)(4) to clarify that emissions to be calculated are annual emissions. In addition, we are proposing to revise 40 CFR 98.233(k)(4)(i) by removing the reference to 40 CFR 98.233(j)(1) as this reference was incorrectly directed to the onshore production storage tank calculations where owners and operators could use a software program to determine flashing emissions which are not covered under the transmission storage tanks calculations. Finally, we are also proposing to revise 40 CFR 98.233(k)(4)(ii) by clarifying that the flare stack calculations are to be used for emissions that are sent to a flare and not from a flare. The latter resulted in confusion from reporters as to what emissions they would be capturing by using the flare calculation methodologies.

We are proposing to amend the provisions in 40 CFR 98.233(z) for determining combustion emissions from both the onshore petroleum and natural gas production and natural gas distribution industry segments. First, we are proposing to include an engineering equation to be used for determining  $CH_4$  emissions resulting from combustion of a fuel. The rule did not include a specific equation or methodology for determining the methane emissions from combustion of fuel, however, the provisions stated that both  $CH_4$  and  $CO_2$  emissions were to be calculated from the combustion of fuel. In addition, we are proposing to amend the equation used to calculate  $CO_2$  emissions by including a combustion efficiency parameter.

We are proposing to clarify that 40 CFR 98.233(z)(6), calculation of  $N_2O$  emissions from stationary combustion, applies only to units combusting field gas or process vent gas. Units combusting other fuels listed in Table C-1 would estimate  $N_2O$  (and  $CH_4$ ) emissions using the appropriate Tier 1 equations in subpart C. We have reorganized section 98.233(z)(6) to incorporate this proposed amendment. We are proposing to amend Equation W-40 to account for an incorrect exponent on the conversion factor from kilograms to metric tons. Without making this change to the rule, the emissions would have resulted in an incorrect calculation of emissions.

We are also proposing to revise equation W-41 to insert missing variables a and b from the equation. Without including the missing variables, equation 41 would lack clarity and be unusable.

<sup>3</sup> Please see Response to Comment number EPA-HQ-OAR-2009-0923-1018-27 in Mandatory Greenhouse Gas Reporting Rule Subpart W—Petroleum and Natural Gas: EPA's Response to Public Comments, Volume 8. This document can be found at [http://www.epa.gov/climatechange/emissions/downloads10/Subpart-W\\_RTC\\_part2.pdf](http://www.epa.gov/climatechange/emissions/downloads10/Subpart-W_RTC_part2.pdf).



*Emission Factor Tables.* We are proposing to revise the emission factors for high bleed, low bleed, and intermittent bleed pneumatic devices to correct for an error where the original emission factors were on a CH<sub>4</sub> basis and should have been adjusted to account for the total hydrocarbon basis as noted in equation. These proposed revisions would apply to Table W-3 and Table W-4.

*Other Technical Corrections.* EPA is proposing to clarify in 40 CFR 98.236(c)(6)(ii)(B) that only the number of workovers with hydraulic fracturing that vent gas to the atmosphere or flare gas needs to be reported. The current rule language could suggest you must report on the total number of workovers per year, including those that don't involve hydraulic fracture and those that do not vent gas to the atmosphere.

It came to EPA's attention that the density parameter in Equation W-36 was calculated incorrectly. EPA proposes correcting these parameters to 0.0520 kg/ft<sup>3</sup> for CO<sub>2</sub> and N<sub>2</sub>O, and 0.0190 kilograms per square foot (kg/ft<sup>3</sup>) for CH<sub>4</sub> at 68° F and 14.7 pounds per square inch absolute (psia).

### C. Subpart FF—Underground Coal Mines

*Proposed changes to Subpart A.* We are proposing to amend Table A-3 to subpart A of part 98. According to Table A-3 to subpart A of part 98, all underground coal mines that are subject to quarterly or more frequent sampling by MSHA of ventilation systems (subpart FF) must report, regardless of size.

This threshold was based on EPA's understanding that quarterly sampling by MSHA was only done at the largest, gassiest mines, defined as those emitting more than 100,000 actual cubic feet (acf) CH<sub>4</sub> per day. For example, the proposal preamble states,

"We propose that all active underground coal mines for which CH<sub>4</sub> from the ventilation system is sampled quarterly by MSHA (or on a more frequent basis), are required to report under this rule. MSHA conducts quarterly testing of CH<sub>4</sub> concentration and flow at mines emitting more than 100,000 cf CH<sub>4</sub> per day. We selected this threshold because subjecting underground mine operators to a new emissions-based threshold is unnecessarily burdensome, as many of these mines are already subject to MSHA regulations. The MSHA threshold for reporting of 100,000 cf CH<sub>4</sub> per day covers approximately 94 percent of the CH<sub>4</sub> emitted from underground coal mine ventilation systems and about 86 percent of total emissions from underground mining (including stationary fuel combustion emissions at mine sites, as shown in Table FF-1 of this preamble)."

In the proposal preamble, we estimated that this threshold covers only about 128 of the estimated 612 active underground mines in the United States (74 FR 16553). Although it was not evident in reviewing the public comments received on the proposed subpart FF, since finalization we have learned that the threshold was based on an incorrect understanding that MSHA only samples quarterly at mines liberating 100,000 acf of CH<sub>4</sub> or more per day.

If the current regulatory threshold is retained, all mines would be required to report. This would add nearly 500 mines to the number previously expected to report, but these 500 mines would represent only another 14 percent of the total GHG emissions from underground coal mines. EPA is reviewing ways to address this and ensure that the threshold in the rule reflects EPA's longstanding intent to capture the gassiest mines that are responsible for the majority of emissions from underground coal mines in the United States.

We are proposing to amend the language so that mines liberating 36,500,000 acf of CH<sub>4</sub> or more per year from their ventilation systems are subject to the rule. This capacity threshold (equivalent to an average of 100,000 acf of CH<sub>4</sub> or more per day) may be more easily identifiable for the coal industry, is consistent with our original intent in terms of coverage, and removes reporting requirement for the approximately 500 mines.

We considered but are not proposing, a threshold of 15,000 metric tons CO<sub>2</sub>e per year. This threshold would also be consistent with our original intent in terms of coverage and it would remove the reporting requirement for the approximately 500 mines. However, it would be less familiar to industry than the roughly equivalent threshold of 36,500,000 acf of CH<sub>4</sub> or more per year.

*Equations FF-1 and FF-3.* We are proposing the following technical amendments to Equations FF-1 and FF-3 in 40 CFR 98.323.

We propose to amend 40 CFR 98.324(a) and 98.324(b) to specify that variables "V," "MCF," "C," "T," and "P" are not "daily" rates. We are also proposing to edit the units of "V" to cfm from scfm and to revise the units for "C" to read "%" to allow for the use of "C" on a dry basis.

*Sampling for pressure.* We propose to amend FF-1 to allow facilities to use the annual average barometric pressure from the nearest NOAA weather service station as a default to measuring ventilation system pressure. According to MSHA, approved equipment to

conduct pressure measurements is not readily available in the United States.

*Sampling for moisture content.* We received numerous questions regarding the placement of timing of sampling for moisture content. We are proposing to add a paragraph (d) to 40 CFR 98.324 to specify that when flow and concentration are measured on different bases, moisture content is measured at the location of the flow meter at least weekly if using CEMS, and at the location and time of the grab sample, if using grab samples.

Additionally, we received numerous inquiries about how reporters are to measure for moisture content, and asking whether measurements were really necessary because no moisture content measurement requirements are in 40 CFR 98.324. To clarify how and when reporters are to measure for moisture content, we are proposing to amend 40 CFR 98.323 and 98.324 to include reference to calibration and documentation of procedures for moisture content monitors. These proposed amendments clarify that the moisture content is to be based on measurement values and not assumed moisture content values. In related amendments, we are proposing to amend 40 CFR 98.326(o) to clarify the reporting requirements for temperature, pressure, and moisture content measurements. Together, the proposed amendments to Equations FF-1 and FF-3 and 40 CFR 98.324 would clarify that moisture content need only be determined when the concentration and flow measurements are made on different basis (one wet and one dry) and that, if needed, the moisture content must be measured.

*MSHA data.* We received numerous comments on the use of MSHA data to calculate emissions. MSHA samples volume and concentration of methane, but does not collect data on temperature, pressure, and moisture content, which are required inputs for the equations in this subpart. To allow facilities to use MSHA data, we propose to amend 40 CFR 98.324(b)(2) to clarify that temperature and moisture content must be sampled at the same time and location as the MSHA samples, and that for pressure, facilities must use either a measured value or the average annual barometric pressure from the nearest NOAA weather service station.

*Monitoring equipment.* We propose to amend 40 CFR 98.324(g) to include the use of infrared and flame ionization analyzers with the provision that they are calibrated annually using measurements made by gas chromatography methods. The infrared and flame ionization analyzers are

frequently used by the coal mining industry and they are often more familiar with their calibration and operation.

We propose to amend 40 CFR 98.324(f) for consistency with the types of monitoring equipment required. We propose to replace references to “fuel flow meters” with “flow meters,” because the gas that is measured may or may not be used as a fuel. We also propose to delete references to “heating value monitors,” and “sour gas flow meters” because these monitors and meters are not required.

#### *D. Subpart II—Industrial Wastewater Treatment*

We are proposing clarifying amendments and technical corrections to subpart II to address questions EPA has received about the rule’s requirements, as well as to clarify terminology.

We are proposing to amend 40 CFR 98.352(d) to replace the term “landfill gas” with “biogas” to correct a typographical error.

We are proposing to amend the definitions of the terms for “ $T_m$ ” and “ $P_m$ ” in Equation II–4 to refer to “average temperature” and “average pressure” to clarify how reporters should use the multiple temperature and pressure measurements that they may make during a measurement period. We are also proposing to amend these definitions to clarify how the calculation should be adjusted if the flow rate meter automatically corrects for temperature and pressure.

We are proposing to amend 40 CFR 98.353(c)(2)(ii), 40 CFR 98.353(c)(2)(iii)(A) and (B), and 40 CFR 98.354(c) and (d) to replace “once each calendar week, with at least three days between measurements” with “at least once each calendar week; if only one measurement is made each calendar week, there must be at least three days between measurements,” to clarify what is meant by weekly sampling.

We are proposing to amend Equation II–6 of 40 CFR 98.353 to correct an error in the placement of brackets and parentheses. This amendment will eliminate the possibility that the equation will return incorrect quantities of methane emissions. We are also proposing to amend the units in the definition of  $CH_4E_n$  under Equation II–6 to clarify that the annual quantity should be reported in “metric tons” not “metric tons/yr.”

We are proposing to amend 40 CFR 98.353(c) to reorder the text to clarify that continuous gas flow monitoring is required for each anaerobic sludge digester, anaerobic reactor, or anaerobic

lagoon from which some biogas is recovered; and to clarify that the continuous gas flow measurements must be used to determine cumulative gas production each week. We are also proposing to amend 40 CFR 98.353(c)(1) to replace the term “content” with the term “quantity” to clarify that fully integrated systems report  $CH_4$  quantity which accounts for both  $CH_4$  concentration and biogas flow.

We are proposing to amend 40 CFR 98.354(f) by dividing it into subparagraphs and by deleting an incorrect cross reference, to clarify the monitoring requirements for anaerobic sludge digester, anaerobic reactor, or anaerobic lagoon from which some biogas is recovered.

We are proposing to amend 40 CFR 98.356(a) by replacing the term “explain” with “indicate” to provide guidance to reporters about the information they should include in the description or diagram of their wastewater treatment system. We are also proposing to replace the term “all anaerobic lagoons” with “each anaerobic lagoon” to clarify that reporters should provide the average depth of each lagoon, not the average of all lagoons.

We are proposing to amend 40 CFR 98.356(b)(3) and (4) to clarify that the values for “Bo” and “MCF,” that are used as inputs to Equation II–1 or II–2, are to be taken from Table II–1. We are also proposing to amend 40 CFR 98.356(d)(2) by replacing the text “Cumulative volumetric biogas flow for each week” with “Total weekly volumetric biogas flow for each week (up to 52 weeks/year)” to clarify that reporters should provide the total gas recovered for the week, for up to 52 weeks per year.

We are proposing to amend subpart II (Industrial Wastewater Treatment) (40 CFR 98.350 to 40 CFR 98.358) in multiple places, replacing the term “anaerobic digester” with “anaerobic sludge digester” to clarify the test refers to the anaerobic process defined in 40 CFR 98.350(b)(2); and to replace the term “gas” with “biogas” to clarify the gas referred to is the biogas defined in 40 CFR 98.358.

#### *E. Subpart OO—Suppliers of Industrial Greenhouse Gases*

We are proposing to amend subpart OO to require that the data currently reported under 40 CFR 98.416(a)(8) and (9) be kept as a record rather than reported. We are also proposing to make a corresponding revision to 40 CFR 98.416(a)(10).

Section 98.416(a)(8) requires that fluorinated GHG and nitrous oxide

production facilities report the total mass in metric tons of each reactant fed into the F–GHG or nitrous oxide production process, by process; and section 98.416(a)(9) requires that fluorinated GHG and nitrous oxide production facilities report the total mass in metric tons of the reactants, by-products, and other wastes permanently removed from the F–GHG or nitrous oxide production process, by process. Although these data elements do not, in themselves, represent additions to or subtractions from the U.S. supply of industrial GHGs, we required reporting of these data elements in the October 30, 2009, Mandatory GHG Reporting Rule to facilitate verification of production levels through a material balance. (For more discussion of that decision, see page 26 of the Mandatory Greenhouse Gas Reporting Rule: EPA’s Response to Public Comments, Volume No. 40, Subpart OO—Suppliers of Industrial Greenhouse Gases.)

We are now proposing to require recordkeeping, rather than reporting, of these data elements. After additional consideration, we have concluded that these data elements, by themselves, have somewhat limited usefulness for verifying production levels because the relationship between the masses of the reactants fed into the process, the mass of the nitrous oxide or fluorinated GHG product, and the mass of the reactants, by-products, and other wastes permanently removed from the process can vary. For example, if catalysts are added to the process and subsequently removed from it, the sum of the masses of the product and the materials removed from the process may exceed the sum of the masses of the reactants fed into the process. On the other hand, if by-products or other materials are emitted from the process, *e.g.*, through fugitive emissions, the sum of the masses of the reactants may exceed the sum of the masses of the product and the materials removed from the process. Finally, the accuracies and precisions of the various instruments used to measure the masses of the reactants fed into the process, the mass of the nitrous oxide or fluorinated GHG produced, and the masses of the materials permanently removed from the process may all vary, further complicating comparisons among these quantities. Retention of these data as records would permit on-site verification of production as part of the audit process, which would have the benefit of permitting consideration of other production process information (*e.g.*, the use of catalysts) in making comparisons among the inputs and outputs of the production process. We

estimate that approximately 20 facilities produce fluorinated GHGs or nitrous oxide in the U.S., making on-site verification a practicable option for subpart OO.

We are also proposing to revise § 98.416(a)(10) by removing the introductory qualifier. In its entirety, the provision currently reads, “For transformation processes that do not produce an F-GHG or nitrous oxide, mass in metric tons of any fluorinated GHG or nitrous oxide fed into the transformation process, by process.” The phrase “for transformation processes that do not produce an F-GHG or nitrous oxide” was intended to prevent double-reporting between this provision and § 98.416(a)(8), which requires reporting of the mass of each reactant fed into the fluorinated GHG or nitrous oxide production process. (In the case where one fluorinated GHG was transformed into another, the first fluorinated GHG would be one of the reactants fed into the process and would therefore be reported under (a)(8).) With the proposed removal of § 98.416 (a)(8), the introductory qualifier in § 98.416(a)(10) must be removed to ensure that the quantities of fluorinated GHGs fed into all transformation processes, including transformation processes that produce other fluorinated GHGs, will be reported under subpart OO.<sup>4</sup>

#### F. Subpart RR—Geologic Sequestration of Carbon Dioxide

We are proposing clarifying amendments and technical corrections to subpart RR to correct known errors.

**Accounting for CO<sub>2</sub> Entrained in Produced Water.** We are proposing to clarify 40 CFR 98.443(d) to ensure that CO<sub>2</sub> entrained in produced water that is not processed through a gas-liquid separator is accounted for in the mass balance equation. We intended that CO<sub>2</sub> content in all produced liquids would be determined,<sup>5</sup> and assumed that all produced liquids would be processed through a gas-liquid separator. The text in 40 CFR 98.443(d), and the associated equations (Equations RR-7, RR-8, and RR-9) are based on measurements made at a separator to calculate the amount of CO<sub>2</sub> in produced fluids. However, EPA has recognized that in some situations, including water removed for pressure relief or reservoir maintenance, fluids may be removed from the subsurface without being processed through a

separator. The current text and equations would not account for CO<sub>2</sub> in water that is withdrawn from the subsurface and reinjected or disposed without going through a separator.

To address this issue, we propose adding a new sentence to 40 CFR 98.443(d) to specifically account for any CO<sub>2</sub> in fluids that are produced and not processed through a separator. We also propose adding a new sentence to 40 CFR 98.443(d)(3) to clarify that the reporter must include additional information regarding the measurement methods used to determine the concentration of CO<sub>2</sub> in fluids, and a discussion of how the amount of produced CO<sub>2</sub> would be determined, in the monitoring, reporting and verification (MRV) plan. In the MRV plan, the reporter would describe the disposition of the produced water (reinjecting into another zone, reused, or otherwise disposed) and provide justification for determining whether the CO<sub>2</sub> entrained in the water is sequestered. The MRV plan would also describe considerations the reporter intends to use to calculate CO<sub>2</sub> from produced water for the mass balance equation.

**CO<sub>2</sub> Emissions from Equipment Leaks and Vented Emissions of CO<sub>2</sub>.** We are proposing to revise the term “CO<sub>2</sub> equipment leakage and vented CO<sub>2</sub> emissions” throughout subpart RR with the term “CO<sub>2</sub> emissions from equipment leaks and vented emissions of CO<sub>2</sub>.” This change is proposed to ensure consistency with the terminology that is used in 40 CFR part 98 subpart W and to more accurately describe the equipment between flow meters and wellheads for which monitoring requirements are specified in subpart RR. Specifically, we are proposing the following changes:

- At 40 CFR 98.442(e) and 98.442(f), revise the term “Mass of CO<sub>2</sub> equipment leakage and vented CO<sub>2</sub> emissions” to read “Mass of CO<sub>2</sub> emissions from equipment leaks and vented emissions of CO<sub>2</sub>.”

- In Equations RR-11 and RR-12 at 40 CFR 98.443, revise the term “Total annual CO<sub>2</sub> mass emitted (metric tons) as equipment leakage or vented emissions” to read “Total annual CO<sub>2</sub> mass emitted (metric tons) from equipment leaks and vented emissions of CO<sub>2</sub>.”

- At 40 CFR 98.444(d), revise the heading “CO<sub>2</sub> equipment leakage and vented CO<sub>2</sub> emissions” to read “CO<sub>2</sub> emissions from equipment leaks and vented emissions of CO<sub>2</sub>.”

- At 40 CFR 98.445(e), revise the term “CO<sub>2</sub> equipment leakage or vented CO<sub>2</sub> emissions” to read “CO<sub>2</sub> emissions from

equipment leaks and vented emissions of CO<sub>2</sub>.”

- At the introductory text of 40 CFR 98.446(f)(3), revise the term “CO<sub>2</sub> equipment leakage and vented CO<sub>2</sub> emissions” to read “CO<sub>2</sub> emissions from equipment leaks and vented emissions of CO<sub>2</sub>.”

- At 40 CFR 98.446(f)(3)(i) and 98.446(f)(3)(ii), revise the term “mass of CO<sub>2</sub> emitted (in metric tons) annually as equipment leakage or vented emissions” to read “mass of CO<sub>2</sub> emitted (in metric tons) annually from equipment leaks and vented emissions of CO<sub>2</sub>.”

- At 40 CFR 98.447(a)(5) and 98.447(a)(6), revise the term “CO<sub>2</sub> emitted as equipment leakage or vented emissions” to read “CO<sub>2</sub> emitted from equipment leaks and vented emissions of CO<sub>2</sub>.”

- At 40 CFR 98.448(a)(5), revise the term “considerations for calculating equipment leakage and vented emissions” to read “considerations for calculating CO<sub>2</sub> emissions from equipment leaks and vented emissions of CO<sub>2</sub>.”

**Other Technical Corrections.** We are proposing to amend a cross reference in the introductory language of 40 CFR 98.446(a)(2) and 40 CFR 98.446(a)(3). The incorrect references refer the reader to 40 CFR 98.446(a)(5), but should refer the reader 40 CFR 98.446(a)(4). We are also proposing to amend a cross reference at 40 CFR 98.446(f)(1)(vii). The incorrect reference refers the reader to 40 CFR 98.446(f)(1)(i), but should refer the reader to 40 CFR 98.446(f)(1)(ii).

We are proposing to revise the data reporting element at 40 CFR 98.446(e) and the introductory text at 40 CFR 98.446(f). As currently written, it is ambiguous when reporters would report total amount sequestered. We are proposing that the revised data reporting element at 40 CFR 98.446(e) read as follows: “Report the date that you began collecting data for calculating total amount sequestered according to § 98.448(a)(7) of this subpart”. We are proposing that the revised introductory text at 40 CFR 98.446(f) read as follows: “Report the following. If the date specified in paragraph (e) of this section is during the reporting year for this annual report, report the following starting on the date specified in paragraph (e) of this section.”

We are proposing to revise the heading of 40 CFR 98.448(e) to correct a typographical error. The text of 40 CFR 98.448(e) refers to requirements for revised MRV plans, but the heading is incorrectly labeled as “Final MRV plan.” We propose to revise the heading to read “Revised MRV plan.”

<sup>4</sup> Note that if a fluorinated GHG is produced and transformed at the same facility, neither its production nor its transformation are required to be reported under subpart OO.

<sup>5</sup> See Section II.B.4 of preamble to the final Subpart RR rule (75 FR 75065, December 1, 2010).

We are proposing to revise the definition of “CO<sub>2</sub> received” at 40 CFR 98.449 to correct a typographical error by adding the word “means” after the CO<sub>2</sub> received defined term. The definition would read “CO<sub>2</sub> received means the CO<sub>2</sub> stream that you receive to be injected for the first time into a well on your facility that is covered by this subpart. CO<sub>2</sub> received includes, but is not limited to, a CO<sub>2</sub> stream from a production process unit inside your facility and a CO<sub>2</sub> stream that was injected into a well on another facility, removed from a discontinued enhanced oil or natural gas or other production well, and transferred to your facility.”

#### G. Subpart TT—Industrial Waste Landfills

Numerous clarifying amendments and technical corrections are proposed to subpart TT to address questions EPA has received about the rule’s requirements and to correct known errors. Technical amendments to the rule are also proposed to address some additional questions. These more substantive technical amendments are discussed first, and then the clarifying amendments are presented.

*Determining Waste-specific DOC values for Closed Landfills.* We are proposing to amend 40 CFR 98.464 by adding a new paragraph (c) to provide methodologies for closed landfills or active landfills that have stopped accepting certain types of wastes to determine the volatile solids concentration (for exemption purposes under 40 CFR 98.460(c)(2)(xii)) or to determine the waste-specific DOC values for historically disposed waste streams. The proposed provisions would allow landfills to identify waste streams similar to those that had been historically placed in the landfill, measure the volatile solids concentration of these “similar” waste streams, and use those measured values to assess the applicability of the exemption under 40 CFR 98.460(c)(2)(xii) or to determine the average DOC value for the historical waste streams. The proposed provisions also allow use of process knowledge to determine the volatile solids concentration and, if needed, to calculate the corresponding DOC value if a similar waste stream cannot be identified.

This provision is being proposed to allow industrial waste landfill owners and operators a means by which to develop volatile solids concentration and site-specific DOC values for historically disposed waste streams. The site-specific DOC values will in turn improve the accuracy of the modeled

methane generation. The July 12, 2010, final rule had no provisions by which waste streams that were not disposed of in the landfill during the first reporting year could be assessed. These waste streams would be required to use the default DOC values, which have a higher degree of uncertainty. Facilities may still elect to use the default DOC values, but proposed amendments provide methodologies for developing site-specific DOC values for these “historically-disposed” waste streams.

We are also proposing to amend 40 CFR 98.467 to clarify that records must be retained for the volatile solids concentration determinations, including determinations using process knowledge.

*Equations for Determining Volatile Solids and DOC Values.* We are proposing to delete Equation TT-7 and amend Equation TT-8 to 40 CFR 98.464 to correct inadvertent errors in these equations. These equations as presented in the July 12, 2010, final rule were incorrect because the volatile solids concentration was expected to have units of mass of volatile solids per mass of (wet) waste. However, per Standard Method 2540G “Total, Fixed, and Volatile Solids in Solid and Semisolid Samples,” the volatile solids concentration is determined on a dry basis (milligram (mg) volatile solids per mg dried solids). As such, Standard Method 2540G provides the volatile solids concentration in the appropriate units needed for 40 CFR 98.464(b)(3), and Equation TT-7 in the final rule can be deleted. Additionally, we propose to amend 40 CFR 98.464(b)(4) to correct the errors in Equation TT-8 (which is proposed to be renumbered as Equation TT-7) and to clarify the units of the variables used in the equation.

We are revising the variable “F” in Equation TT-1 and new Equation TT-7 (which was Equation TT-8) to correct the measured CH<sub>4</sub> concentration for zero percent oxygen. We are proposing to change “F<sub>x</sub>” to be “F” in Equation TT-1 because this parameter should be a fixed value for a given reporting year and revising the definition of “F” to be “Fraction by volume of CH<sub>4</sub> in landfill gas (fraction, dry basis, corrected to 0% oxygen). If you have a gas collection system, use the annual average CH<sub>4</sub> concentration from measurement data for the current reporting year; otherwise, use the default value of 0.5” to clarify that, if a measured value of CH<sub>4</sub> concentration is used it should be based on measurements made during the reporting year and the volume fraction should be adjusted to 0 percent oxygen for use in Equation TT-1.

In addition, we are proposing to add a new paragraph (g) in 40 CFR 98.464 and a new Equation TT-8 to provide guidance on how to correct the measured CH<sub>4</sub> concentration for zero percent oxygen in order to arrive at an appropriate value for F in the case of air infiltration into the landfill gas at the monitoring location.

*Provisions for Actively Aerated Landfills and Other Amendments To Conform with Amendments to subpart HH.* Similar to amendments that were made to subpart HH (Municipal Solid Waste Landfills), we propose to amend the definition of the methane correction factor (MCF) to allow landfills with active aeration units to use an MCF value other than the default value of 1. For landfills with active aeration units, a site-specific MCF can be developed based on the amount of aeration and the fraction of the landfill that is actively aerated. Owners and operators of landfills with active aeration can use the default MCF factor of 1 or they may elect to develop a site-specific MCF value. The owner or operator of the industrial waste landfill must document the basis for the alternative MCF value; in no cases can an MCF value less than 0.5 be used. These amendments are being proposed because the default MCF value of 1 is expected to overestimate the modeled methane generation at a facility that actively aerates the waste in the landfill. Additionally, we propose to add 40 CFR 98.466(d)(4) to require reporting of the MCF value and the basis for using an MCF value other than the default value of 1.

We are proposing to define the term “construction and demolition waste landfills” as defined in subpart HH and use that term rather than “dedicated construction and demolition waste landfills.”

We are also proposing to revise the footnote to Table TT-1 to subpart TT of part 98 to clarify that leachate recirculation rates can be determined from company records or engineering estimates and that the owner or operator of a landfill that uses leachate recirculation may elect to use the k value for the wet climate rather than calculating the leachate recirculation rate. These amendments provide improved consistency between the reporting requirements for municipal and industrial waste landfills.

*Other Technical Corrections.* We are proposing other technical corrections for subpart TT to correct typographical errors, to correct equations, and to provide minor clarifications. These proposed corrections are summarized below:

- In 40 CFR 98.460(c)(2)(i), replacing “Coal combustion residue (e.g., fly ash)” with “Coal combustion or incinerator ash (e.g., fly ash)” to better describe our intent to classify all combustion ash products as inert.

- In 40 CFR 98.463(a)(1):

- Revising the definition of  $G_{CH_4}$  to delete the word “rate” because the units of the modeled methane generation is metric tons.
- Revising the definition of  $DOC_x$  from “degradable organic carbon for year X \* \* \*” to be “degradable organic carbon for waste disposed in year X \* \* \*” for clarity.

- In 40 CFR 98.463(a)(2):

- Revising “January 1, 1980” to be “January 1, 1960” in both places to correct an inadvertent error.
- Replacing the term “first emissions monitoring year” with “first emissions reporting year” to improve consistency with the terminology used in other sections of subpart TT.

- In 40 CFR 98.463(a)(2)(ii)(C):

- Deleting the phrase “fixed average annual bulk waste disposal quantity for each year for which historic disposal quantity and” in the paragraph text and adding to the definition of  $W_x$  “This annual bulk waste disposal quantity applies for all years from ‘YrOpen’ to ‘YrData’ inclusive” to clarify that the value calculated by Equation TT-4 applies for all years from “YrOpen” to “YrData” inclusive.

- Revising the definition of LFC and YrData to allow closed landfills that have some measurement data to appropriately calculate  $W_x$  only for years for which the closed landfill does not have waste disposal data available from company records or from Equation TT-3.

- In 40 CFR 98.464(b), replacing “For each waste stream for which you choose to determine \* \* \*” with “For each waste stream received during the reporting year for which you choose to determine \* \* \*” for clarity given the addition of 40 CFR 98.464(c).

- In 40 CFR 98.464(b)(1), adding the parenthetical “(as received at the landfill)” to clarify that the representative sample of each waste stream was to be determined “as received at that landfill” (as opposed to sampling waste in “closed” sections of the landfill) and for clarity given the addition of 40 CFR 98.464(c).

- In 40 CFR 98.466(b), replacing “Report the following waste characterization information:” with “Report the following waste characterization and modeling

information:” to better describe the reporting elements included in this paragraph.

- Moving paragraphs 40 CFR 98.466(d)(3) and (4) to 98.466(b)(3) and (4) because these reporting elements are based on reporting year practices and do not need to be separately reported for each year or used in the summation for Equation TT-1. Also, to clarify that the fraction of  $CH_4$  in the landfill gas, F, should be based on  $CH_4$  concentration corrected to 0% oxygen.

- In 40 CFR 98.466(b)(2), adding “\* \* \* for which Equation TT-1 of this subpart is used to calculate modeled  $CH_4$  generation” to clarify that only descriptions of waste streams disposed of in the landfill and used in Equation TT-1 must be reported (as opposed to all wastes managed on-site regardless of whether the waste is managed in the landfill).

- In 40 CFR 98.466(c)(3)(ii), replacing “The year, the waste disposal quantity and production quantity for each year Equation TT-2 applies” with “The year, the waste disposal quantity and production quantity for each year used in Equation TT-2 of this subpart to calculate the average waste disposal factor (WDF)” to clarify that these data are to be reported for the years used to calculate WDF, not the years for which WDF was subsequently used to calculate waste quantities.

- In 40 CFR 98.466(d), adding the phrase “and each year thereafter up” so that the paragraph reads “For each year of landfilling starting with the “Start Year” (S) and each year thereafter up to the current reporting year, report the following information:” to clarify that the reporting elements must be reported separately for each year.

- Adding a new paragraph 40 CFR 98.466(d)(1) to read “The calendar year for which following data elements apply” to ensure the calendar year is also reported. Renumber existing paragraphs 98.466(d)(1) and (2) to (d)(2) and (3) and add the phrase “for the specified year” to ensure the data elements are reported with specified year in the new paragraph 98.466(d)(1).

- In 40 CFR 98.466(f), deleting the word “rate” to conform with revised definition of term and replace it with “( $G_{CH_4}$ )” to clarify this is the equation term to be reported.

- In 40 CFR 98.466(f), adding “(MG)” after “methane generation” to improve clarity and replace “Equation TT-5” with “Equation TT-6” to correct an improper equation cross-reference.

- In 40 CFR 98.468, adding the definition of “design capacity” to clarify what is meant by this term as it is used in 40 CFR 98.460. The definition is

similar to 40 CFR 60.751 (Standards of Performance for Municipal Solid Waste Landfills).

- In Table TT-1, amending the default value of construction and demolition waste from 0.04 to 0.08 to correct an inadvertent error.

- In Table TT-1, revising the description of the waste type “Inert Waste” to read “Inert Waste [i.e., wastes listed in 40 CFR 98.460(c)(2)]” to correct an incorrect cross-reference.

### III. Statutory and Executive Order Reviews

#### A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review

This action is not a “significant regulatory action” under the terms of Executive Order 12866 (58 FR 51735, October 4, 1993) and is therefore not subject to review under Executive Orders 12866 and 13563 (76 FR 3821, January 21, 2011).

#### B. Paperwork Reduction Act

This action does not impose any new information collection burden. These proposed amendments do not make any substantive changes to the reporting requirements in any of the subparts for which amendments are being proposed. In many cases, the proposed amendments to the reporting requirements could potentially reduce the reporting burden by making the reporting requirements conform more closely to current industry practices. However, the OMB has previously approved the information collection requirements for subparts A and OO contained in the regulations promulgated on October 30, 2009, subpart W promulgated on November 30, 2010, subpart DD promulgated on December 1, 2010, subparts FF and TT promulgated on July 12, 2010, and subpart RR promulgated on December 1, 2010 under 40 CFR part 98 under the provisions of the *Paperwork Reduction Act*, 44 U.S.C. 3501 *et seq.*, and has assigned OMB control numbers 2060-0629; 2060-0650; and 2060-0647; and 2060-0649 respectively. The OMB control numbers for EPA’s regulations in 40 CFR are listed in 40 CFR part 9.

Further information on EPA’s assessment on the impact on burden can be found in the Technical Corrections and Amendments Cost Memo in docket number EPA-HQ-OAR-2011-0147.

#### C. Regulatory Flexibility Act (RFA)

The RFA generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice

and comment rulemaking requirements under the Administrative Procedure Act or any other statute unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions.

For purposes of assessing the impacts of this proposed rule on small entities, small entity is defined as: (1) A small business as defined by the Small Business Administration's regulations at 13 CFR 121.201; (2) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of less than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.

After considering the economic impacts of these proposed rule amendments on small entities, I certify that this action will not have a significant economic impact on a substantial number of small entities. The proposed rule amendments will not impose any new requirement on small entities that are not currently required by the regulation of subparts A and OO promulgated on October 30, 2009; subparts FF, II, and TT promulgated on July 12, 2010; subpart W promulgated on November 30, 2010, or subparts DD or RR, both promulgated on December 1, 2010.

EPA took several steps to reduce the impact of 40 CFR part 98 on small entities when developing the final GHG reporting rules in 2009 and 2010. For example, EPA determined appropriate thresholds that reduced the number of small businesses reporting. In addition, EPA conducted several meetings with industry associations to discuss regulatory options and the corresponding burden on industry, such as recordkeeping and reporting. Finally, EPA continues to conduct significant outreach on the GHG reporting program and maintains an "open door" policy for stakeholders to help inform EPA's understanding of key issues for the industries.

We continue to be interested in the potential impacts of the proposed rule amendments on small entities and welcome comments on issues related to such impacts.

#### *D. Unfunded Mandates Reform Act (UMRA)*

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), 2 U.S.C. 1531–1538, requires Federal agencies, unless otherwise prohibited by law, to

assess the effects of their regulatory actions on State, local, and Tribal governments and the private sector. Federal agencies must also develop a plan to provide notice to small governments that might be significantly or uniquely affected by any regulatory requirements. The plan must enable officials of affected small governments to have meaningful and timely input in the development of EPA regulatory proposals with significant Federal intergovernmental mandates and must inform, educate, and advise small governments on compliance with the regulatory requirements.

The proposed rule amendments do not contain a Federal mandate that may result in expenditures of \$100 million or more for State, local, and tribal governments, in the aggregate, or the private sector in any one year. Thus, the proposed rule amendments are not subject to the requirements of section 202 and 205 of the UMRA. This rule is also not subject to the requirements of section 203 of UMRA because it contains no regulatory requirements that might significantly or uniquely affect small governments. The proposed amendments will not impose any new requirements that are not currently required for 40 CFR part 98, and the rule amendments would not unfairly apply to small governments. Therefore, this action is not subject to the requirements of section 203 of the UMRA.

#### *E. Executive Order 13132: Federalism*

This action does not have federalism implications. It will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132.

These amendments apply directly to facilities that supply certain products that would result in GHGs when released, combusted or oxidized and facilities that directly emit greenhouses gases. They do not apply to governmental entities unless the government entity owns a facility that directly emits GHGs above threshold levels (such as a landfill), so relatively few government facilities would be affected. This regulation also does not limit the power of States or localities to collect GHG data and/or regulate GHG emissions. Thus, Executive Order 13132 does not apply to this action.

Although section 6 of Executive Order 13132 does not apply to this action, EPA did consult with State and local officials or representatives of State and local governments in developing subparts A

and OO promulgated on October 30, 2009; subparts FF, II, and TT promulgated on July 12, 2010; subpart W promulgated on November 30, 2010, and subparts DD and RR, both promulgated on December 1, 2010. A summary of EPA's consultations with State and local governments is provided in Section VIII.E of the preamble to the 2009 final rule.

In the spirit of Executive Order 13132, and consistent with EPA policy to promote communications between EPA and State and local governments, EPA specifically solicits comment on this proposed action from State and local officials.

#### *F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments*

This action does not have tribal implications, as specified in Executive Order 13175 (65 FR 67249, November 9, 2000). The proposed rule amendments would not result in any changes to the current requirements of 40 CFR part 98. Thus, Executive Order 13175 does not apply to this action.

Although Executive Order 13175 does not apply to this action, EPA sought opportunities to provide information to Tribal governments and representatives during the development of the rules for subparts A and OO promulgated on October 30, 2009; subparts FF, II, and TT promulgated on July 12, 2010; subpart W promulgated on November 30, 2010, and subparts DD and RR, both promulgated on December 1, 2010. A summary of the EPA's consultations with Tribal officials is provided in Sections VIII.D and VIII.F of the preamble to the 2009 final rule and in Section IV.F of the final rule for subpart W.

#### *G. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks*

EPA interprets Executive Order 13045 (62 FR 19885, April 23, 1997) as applying only to those regulatory actions that concern health or safety risks, such that the analysis required under section 5–501 of the Executive Order has the potential to influence the regulation. This action is not subject to Executive Order 13045 because it does not establish an environmental standard intended to mitigate health or safety risks.

#### *H. Executive Order 13211: Actions That Significantly Affect Energy Supply, Distribution, or Use*

This action is not subject to Executive Order 13211 (66 FR 28355, May 22, 2001), because it is not a significant

regulatory action under Executive Order 12866.

I. National Technology Transfer and Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (NTTAA), Public Law No. 104-113 (15 U.S.C. 272 note) directs EPA to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies. NTTAA directs EPA to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable voluntary consensus standards.

This proposed rulemaking does not involve technical standards. Therefore, EPA is not considering the use of any voluntary consensus standards.

J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

Executive Order 12898 (59 FR 7629, February 16, 1994) establishes Federal executive policy on environmental justice. Its main provision directs Federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations in the United States.

EPA has determined that this proposed rule will not have disproportionately high and adverse human health or environmental effects on minority or low-income populations because it does not affect the level of protection provided to human health or the environment because it is a rule addressing information collection and reporting procedures.

List of Subjects in 40 CFR Part 98

Environmental protection, Administrative practice and procedure, Greenhouse gases, Suppliers, Reporting and recordkeeping requirements.

Dated: July 19, 2011.

Lisa P. Jackson, Administrator.

For the reasons stated in the preamble, part 98 of title 40, chapter I,

of the Code of Federal Regulations is proposed to be amended as follows:

PART 98—[AMENDED]

1. The authority citation for part 98 continues to read as follows:

Authority: 42 U.S.C. 7401-7671q.

2. Section 98.2 is amended by:

- a. Revising paragraph (d).
b. Revising paragraph (e).
c. Revising paragraph (f) introductory text.
d. Revising paragraph (h).
e. Revising paragraph (i)(3).

Subpart A—[Amended]

§ 98.2 Who must report?

(d) To calculate GHG quantities for comparison to the 25,000 metric ton CO2 per year threshold for importers and exporters of coal-to-liquid products under paragraph (a)(4) of this section, calculate the mass in metric tons per year of CO2 that would result from the complete combustion or oxidation of the quantity of coal-to-liquid products that are imported during the reporting year and, that are exported during the reporting year. Compare the imported quantities and the exported quantities separately to the 25,000 metric ton CO2 per year threshold. Calculate the quantities using the methodology specified in subpart LL of this part.

(e) To calculate GHG quantities for comparison to the 25,000 metric ton CO2e per year threshold for importers and exporters of petroleum products under paragraph (a)(4) of this section, calculate the mass in metric tons per year of CO2 that would result from the complete combustion or oxidation of the combined volume of petroleum products and natural gas liquids that are imported during the reporting year and that are exported during the reporting year. Compare the imported quantities and the exported quantities separately to the 25,000 metric ton CO2 per year threshold. Calculate the quantities using the methodology specified in subpart MM of this part.

(f) To calculate GHG quantities for comparison to the 25,000 metric ton CO2e per year threshold under paragraph (a)(4) of this section for importers and exporters of industrial greenhouse gases and for importers and exporters of CO2, the owner or operator shall calculate the mass in metric tons per year of CO2e imports and exports as described in paragraphs (f)(1) through (f)(3) of this section. Compare the imported quantities and the exported

quantities separately to the 25,000 metric ton CO2 per year threshold.

\* \* \* \* \*

(h) An owner or operator of a facility or supplier that does not meet the applicability requirements of paragraph (a) of this section is not subject to this rule. Such owner or operator would become subject to the rule and reporting requirements, if a facility or supplier exceeds the applicability requirements of paragraph (a) of this section at a later time pursuant to § 98.3(b)(3). Thus, the owner or operator should reevaluate the applicability to this part (including the revising of any relevant emissions calculations or other calculations) whenever there is any change that could cause a facility or supplier to meet the applicability requirements of paragraph (a) of this section. Such changes include but are not limited to process modifications, increases in operating hours, increases in production, changes in fuel or raw material use, addition of equipment, and facility expansion.

(i) \* \* \*

(3) If the operations of a facility or supplier are changed such that all applicable GHG-emitting processes and operations listed in paragraphs (a)(1) through (a)(4) of this section cease to operate, then the owner or operator is exempt from reporting in the years following the year in which cessation of such operations occurs, provided that the owner or operator submits a notification to the Administrator that announces the cessation of reporting and certifies to the closure of all GHG-emitting processes and operations no later than March 31 of the year following such changes. This paragraph (i)(3) does not apply to seasonal or other temporary cessation of operations. This paragraph (i)(3) does not apply to facilities with municipal solid waste landfills or industrial waste landfills, or to underground coal mines. The owner or operator must resume reporting for any future calendar year during which any of the GHG-emitting processes or operations resume operation.

\* \* \* \* \*

3. Section 98.3 is amended by:

- a. Revising paragraph (b) introductory text.
b. Revising paragraph (b)(1).
c. Adding paragraph (b)(4).
d. Revising paragraph (c)(5)(ii).
e. Revising paragraph (c)(7).
f. Revising paragraph (c)(10).
g. Revising paragraph (c)(11).
h. Revising the second sentence of paragraph (g) introductory text.

§ 98.3 What are the general monitoring, reporting, recordkeeping and verification requirements of this part?

\* \* \* \* \*

(b) Schedule. The annual GHG report for reporting year 2010 must be submitted no later than September 30, 2011. The annual report for reporting years 2011 and beyond must be submitted no later than March 31 of each calendar year for GHG emissions in the previous calendar year, except as provided in paragraph (b)(1) of this section.

(1) For reporting year 2011, GHG information required by the subparts listed in paragraphs (b)(1)(i) through (b)(1)(xii) of this section must be submitted no later than September 28, 2012. This reporting date applies only to the data reporting requirements identified in the listed subparts and does not affect data reporting requirements of other subparts that apply to a facility or supplier.

(i) Electronics Manufacturing (subpart I).

(ii) Fluorinated Gas Production (subpart L).

(iii) Magnesium Production (subpart T).

(iv) Petroleum and Natural Gas Systems (subpart W).

(v) Use of Electric Transmission and Distribution Equipment (subpart DD).

(vi) Underground Coal Mines (subpart FF).

(vii) Industrial Wastewater Treatment (subpart II).

(viii) Imports and Exports of Equipment Pre-charged with Fluorinated GHGs or Containing Fluorinated GHGs in Closed-cell Foams (subpart QQ).

(ix) Geologic Sequestration of Carbon Dioxide (subpart RR).

(x) Manufacture of Electric Transmission and Distribution (subpart SS).

(xi) Industrial Waste Landfills (subpart TT).

(xii) Injection of Carbon Dioxide (subpart UU).

\* \* \* \* \*

(4) Unless otherwise stated, if the final day of any time period falls on a weekend or a Federal holiday, the time period shall be extended to the next business day.

(c) \* \* \*

(5) \* \* \*

(ii) Quantity of each GHG from each applicable supply category in Table A-5 of this subpart, expressed in metric tons of each GHG. For fluorinated GHG, report quantities of all fluorinated GHG, including those not listed in Table A-1 of this subpart.

\* \* \* \* \*

(7) A brief description of each "best available monitoring method" used, the parameter measured using the method, and the time period during which the "best available monitoring method" was used, if applicable.

\* \* \* \* \*

(10) NAICS code(s) that apply to the facility or supplier.

(i) Primary NAICS code. Report the NAICS code that most accurately describes the facility or supplier's primary product/activity/service. The primary product/activity/service is the principal source of revenue for the facility or supplier. A facility or supplier that has two distinct products/activities/services providing comparable revenue may report a second primary NAICS code.

(ii) Additional NAICS code(s). Report all additional NAICS codes that describe all product(s)/activity(s)/service(s) at the facility or supplier that are not related to the principal source of revenue.

(11) Legal name(s) and physical address(es) of the highest-level United States parent company(s) of the owners (or operators) of the facility or supplier and the percentage of ownership interest for each listed parent company as of December 31 of the year for which data are being reported according to the following instructions:

(i) If the facility or supplier is entirely owned by a single United States company that is not owned by another company, provide that company's legal name and physical address as the United States parent company and report 100 percent ownership.

(ii) If the facility or supplier is entirely owned by a single United States company that is, itself, owned by another company (e.g., it is a division or subsidiary of a higher-level company), provide the legal name and physical address of the highest-level company in the ownership hierarchy as the United States parent company and report 100 percent ownership.

(iii) If the facility or supplier is owned by more than one United States company (e.g., company A owns 40 percent, company B owns 35 percent, and company C owns 25 percent), provide the legal names and physical addresses of all the highest-level companies with an ownership interest as the United States parent companies, and report the percent ownership of each company.

(iv) If the facility or supplier is owned by a joint venture or a cooperative, the joint venture or cooperative is its own United States parent company. Provide the legal name and physical address of the joint venture or cooperative as the

United States parent company, and report 100 percent ownership by the joint venture or cooperative.

(v) If the facility or supplier is entirely owned by a foreign company, provide the legal name and physical address of the foreign company's highest-level company based in the United States as the United States parent company, and report 100 percent ownership.

(vi) If the facility or supplier is partially owned by a foreign company and partially owned by one or more U.S. companies, provide the legal name and physical address of the foreign company's highest-level company based in the United States, along with the legal names and physical addresses of the other U.S. parent companies, and report the percent ownership of each of these companies.

(vii) If the facility or supplier is a federally owned facility, report "U.S. Government" and do not report physical address or percent ownership.

\* \* \* \* \*

(g) Recordkeeping. \* \* \* Retain all required records for at least 3 years from the date of submission of the annual GHG report for the reporting year in which the record was generated. \* \* \*

4. Section 98.4 is amended by revising paragraph (m)(4) to read as follows:

§ 98.4 Authorization and responsibilities of the designated representative.

\* \* \* \* \*

(m) \* \* \*

(4) Any electronic submission covered by the certification in paragraph (m)(2)(v)(A) of this section and made in accordance with a notice of delegation effective under paragraph (m)(3) of this section shall be deemed to be an electronic submission certified, signed, and submitted by the designated representative or alternate designated representative submitting such notice of delegation.

5. Section 98.6 is amended by revising the definitions of "Blowdown vent stack", "Supplier", and "United States parent company(s)" to read as follows:

§ 98.6 Definitions.

\* \* \* \* \*

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.

\* \* \* \* \*

Supplier means a producer, importer, or exporter in any supply category



included in Table A-5, as defined by the corresponding subpart of this part.

\* \* \* \* \*

United States parent company(s) means the highest-level United States company(s) with an ownership interest in the facility or supplier as of December 31 of the year for which data are being reported.

\* \* \* \* \*

6. Section 98.9 introductory text is revised to read as follows:

**§ 98.9 Addresses.**

All requests, notifications, and communications to the Administrator pursuant to this part, other than submittal of the annual GHG report; the certificate of representation; and other requests, notifications or

communications that can be submitted through the electronic greenhouse gas reporting tool, shall be submitted to the following address:

\* \* \* \* \*

7. Table A-3 to subpart A is amended by revising the entry for "Underground coal mines" and for "Electrical transmission and distribution equipment use" to read as follows:

TABLE A-3 OF SUBPART A OF PART 98—SOURCE CATEGORY LIST FOR § 98.2(a)(1)

**Source Categories<sup>a</sup> Applicable in 2010 and Future Years**

\* \* \* \* \*

**Additional Source Categories<sup>a</sup> Applicable in 2011 and Future Years**

\* \* \* \* \*

Electrical transmission and distribution equipment use at facilities where the total nameplate capacity of SF<sub>6</sub> and PFC containing equipment exceeds 17,820 pounds, as determined under § 98.301 (subpart DD).  
Underground coal mines liberating 36,500,000 actual cubic feet of CH<sub>4</sub> or more per year (subpart FF).

\* \* \* \* \*

<sup>a</sup> Source categories are defined in each applicable subpart.

8. Table A-5 to subpart A is amended by revising the entries for "Petroleum product suppliers (subpart MM)" to read as follows:

TABLE A-5 TO SUBPART A OF PART 98—SUPPLIER CATEGORY LIST FOR § 98.2(a)(4)

**Supplier Categories<sup>a</sup> Applicable in 2010 and Future Years**

\* \* \* \* \*

Petroleum product suppliers (subpart MM):

- (A) All petroleum refineries that distill crude oil.
- (B) Importers of an annual quantity of petroleum products and natural gas liquids that is equivalent to 25,000 metric tons CO<sub>2</sub>e or more.
- (C) Exporters of an annual quantity of petroleum products and natural gas liquids that is equivalent to 25,000 metric tons CO<sub>2</sub>e or more.

\* \* \* \* \*

<sup>a</sup> Suppliers are defined in each applicable subpart.

**Subpart W—[Amended]**

9. Section 98.230 is amended by revising paragraph(a)(3)(ii) to read as follows:

**§ 98.230 Definition of the source category.**

- (a) \* \* \*
- (3) \* \* \*

(ii) All processing facilities that do not fractionate with annual average throughput of 25 MMscf per day or greater.

\* \* \* \* \*

10. Section 98.232 is amended by revising paragraph (d) introductory text and paragraph (i) introductory text to read as follows:

**§ 98.232 GHGs to report.**

\* \* \* \* \*

(d) For onshore natural gas processing, report CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O emissions from the following sources:

\* \* \* \* \*

(i) For natural gas distribution, report CO<sub>2</sub> and CH<sub>4</sub> emissions from the following sources:

\* \* \* \* \*

11. Section 98.233 is amended by:

- a. Revising the definition of "GHG<sub>i</sub>" in Equation W-1 of paragraph (a).
- b. Revising the definition of "GHG<sub>i</sub>" in Equation W-2 and W-2 in paragraph (c).
- c. Revising the first sentence of paragraphs (d)(2), (d)(3), and (d)(4).
- d. Revising paragraphs (e) introductory text, (e)(1) introductory text, (e)(1)(xi) introductory text, (e)(1)(xi)(A) through (C), and (e)(2) introductory text.
- e. Revising paragraph (f)(2) introductory text.
- f. In paragraph (f)(2), revising the introductory text, Equation W-8, and definitions of Equation W-8.
- g. In paragraph (f)(3), revising Equation W-9 and the definitions of Equation W-9.

h. In paragraph (h), revising the definitions of "E<sub>a,n</sub>", "EF<sub>wo</sub>", and "V<sub>f</sub>" in Equation W-13.

- i. Removing paragraph (h)(1).
- j. Redesignating paragraphs (h)(2) and (h)(3) as paragraphs (h)(1) and (h)(2), respectively, and revising new paragraph (h)(1).
- k. Revising paragraphs (i) introductory text and (i)(2).
- l. Revising the definition of "V<sub>v</sub>" in Equation W-14 of paragraph (i)(3).
- m. Revising paragraph (i)(4).
- n. Revising the first sentence of paragraph (j)(1) and revising paragraph (j)(1)(vii).
- o. Revising paragraphs (j)(2), (j)(3) introductory text, and (j)(4) introductory text.
- p. In paragraph (j)(5), revising Equation W-15, revising the definitions of "EF<sub>i</sub>" and "Count", and defining the use of "1,000".
- q. In paragraph (j)(8), revising Equation W-16, revising the definition

of “En”, removing the definition of “Et”, and defining the use of “8,760”.

r. Revising paragraphs (k)(2) and (k)(4).

s. Revising paragraph (q) introductory text.

t. Revising the definition of “ $\rho_i$ ” in Equation W-36 of paragraph (v).

u. Revising paragraph (z) introductory text.

v. In paragraph (z)(2)(iii), revising Equation W-39; adding Equations W-39A and W-39B; adding definitions for “ $E_{a,CH_4}$ ”, “ $\eta$ ”, “ $Y_{CO_2}$ ”, and “ $Y_{CH_4}$ ”; and revising the definitions of “ $Y_j$ ” and “ $R_j$ ”.

w. Revising paragraph (z)(3).

x. Removing paragraphs (z)(6)(i) through (z)(6)(iii).

y. Redesignating paragraphs (z)(4), (z)(5), and (z)(6) as (z)(2)(iv), (z)(2)(v), and (z)(2)(vi), respectively.

z. In newly redesignated paragraph (z)(2)(vi), revising Equation W-40 and revising the definition of “HHV”.

**§ 98.233 Calculating GHG emissions.**

\* \* \* \* \*

(a) \* \* \*

GHG<sub>i</sub> = For onshore petroleum and natural gas production facilities, concentration of GHG<sub>i</sub>, CH<sub>4</sub> or CO<sub>2</sub>, in produced natural gas as defined in paragraph (u)(2)(i) of this section; for facilities listed in § 98.230(a)(4) and (a)(5), GHG<sub>i</sub> equals 0.952 for CH<sub>4</sub> and 1×10<sup>-2</sup> for CO<sub>2</sub>.

\* \* \* \* \*

(c) \* \* \*

GHG<sub>i</sub> = Concentration of GHG<sub>i</sub>, CH<sub>4</sub> or CO<sub>2</sub>, in produced natural gas as defined in paragraph (u)(2)(i) of this section.

\* \* \* \* \*

(d) \* \* \*

(2) *Calculation Methodology 2.* If CEMS is not available but a vent meter is installed, use the CO<sub>2</sub> composition and annual volume of vent gas to calculate emissions using Equation W-3 of this section.

\* \* \* \* \*

(3) *Calculation Methodology 3.* If CEMS or a vent meter is not installed, you may use the inlet or outlet gas flow rate of the acid gas removal unit to calculate emissions for CO<sub>2</sub> using Equation W-4 of this section.

\* \* \* \* \*

(4) *Calculation Methodology 4.* If CEMS or a vent meter is not installed, you may calculate emissions using any standard simulation software packages, such as AspenTech HYSYS® and API 4679 AMINECalc, that uses the Peng-Robinson equation of state, and speciates CO<sub>2</sub> emissions. \* \* \*

(e) *Dehydrator vents.* For dehydrator vents, calculate annual CH<sub>4</sub>, CO<sub>2</sub> and N<sub>2</sub>O (when flared) emissions using any of the calculation methodologies described in paragraph (e) of this section.

(1) *Calculation Methodology 1.* Calculate annual mass emissions from dehydrator vents with annual average daily throughput greater than or equal to 0.4 million standard cubic feet per day using a software program, such as AspenTech HYSYS® or GRI-GLYCalc, that uses the Peng-Robinson equation of state to calculate the equilibrium coefficient, speciates CH<sub>4</sub> and CO<sub>2</sub> emissions from dehydrators, and has provisions to include regenerator

control devices, a separator flash tank, stripping gas and a gas injection pump or gas assist pump. A minimum of the following parameters determined by engineering estimate based on best available data must be used to characterize emissions from dehydrators:

\* \* \* \* \*

(xi) Wet natural gas composition. Determine this parameter by selecting one of the methods described under paragraph (e)(1)(xi) of this section.

(A) Use the wet natural gas composition as defined in paragraph (u)(2)(i) or (u)(2)(ii) of this section.

(B) If wet natural gas composition cannot be determined using paragraph (u)(2)(i) or (u)(2)(ii) of this section, select a representative analysis.

(C) You may use an appropriate standard method published by a consensus-based standards organization if such a method exists or you may use an industry standard practice as specified in § 98.234(b) to sample and analyze wet natural gas composition.

\* \* \* \* \*

(2) *Calculation Methodology 2.* Calculate annual CH<sub>4</sub> and CO<sub>2</sub> emissions from glycol dehydrators with annual average daily throughput less than 0.4 million cubic feet per day using Equation W-5 of this section: \* \* \*

\* \* \* \* \*

(f) \* \* \*

(2) *Calculation Methodology 2.* Calculate the total emissions for well venting for liquids unloading using Equation W-8 of this section.

$$E_{a,n} = \sum_W \left[ V_W \times \left( (0.37 \times 10^{-3}) \times CD_W^2 \times WD_W \times SP_W \right) + \sum_V \left( SFR_W \times (HR_{V,W} - 1.0) \times Z_{V,W} \right) \right] \text{ (Eq. W-8)}$$

Where:

E<sub>a,n</sub> = Annual natural gas emissions at actual conditions, in cubic feet/year.

W = Number of wells with well venting for liquids unloading at the facility.

0.37×10<sup>-3</sup> = {3.14 (pi)/4}/{14.7\*144} (psia converted to pounds per square feet).

CD<sub>W</sub> = Casing diameter for each well, in inches.

WD<sub>W</sub> = Well depth to first producing horizon for each well, in feet.

SP<sub>W</sub> = Shut-in pressure for each well, in pounds square inch atmosphere (psia).

V<sub>W</sub> = Number of vents per year per well.  
SFR<sub>W</sub> = Average sales flow rate of each gas well in cubic feet per hour.

HR<sub>V,W</sub> = 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<sub>V,W</sub> = If HR<sub>V,W</sub> is less than 1.0 then Z<sub>V,W</sub> is equal to 0. If HR<sub>V,W</sub> is greater than or equal to 1.0 then Z<sub>V,W</sub> is equal to 1.

\* \* \* \* \*

(3) \* \* \*

$$E_{a,n} = \sum_W \left[ V_W \times \left( (0.37 \times 10^{-3}) \times CD_W^2 \times WD_W \times SP_W \right) + \sum_V \left( SFR_W \times (HR_{V,W} - 1.0) \times Z_{V,W} \right) \right] \text{ (Eq. W-9)}$$

Where:

E<sub>a,n</sub> = Annual natural gas emissions at actual conditions, in cubic feet/year.

W = Number of wells with well venting for liquids unloading at the facility.

0.37×10<sup>-3</sup> = {3.14 (pi)/4}/{14.7\*144} (psia converted to pounds per square feet).

TD<sub>W</sub> = Tubing diameter for each well, in inches.

WD<sub>W</sub> = Tubing depth to plunger bumper for each well, in feet.

SP<sub>w</sub> = Sales line pressure for each well, in pounds per square inch atmospheric (psia).  
 N<sub>v</sub> = Number of vents per year per well.  
 SFR<sub>w</sub> = Average sales flow rate of each gas well in cubic feet per hour.  
 HR<sub>v,w</sub> = 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<sub>v,w</sub> = If HR<sub>v,w</sub> is less than 0.5 then Z<sub>v,w</sub> is equal to 0. If HR<sub>v,w</sub> is greater than or equal to 0.5 then Z<sub>v,w</sub> is equal to 1.

\* \* \* \* \*  
 (h) \* \* \*

E<sub>s,n</sub> = Annual natural gas emissions in standard cubic feet from a gas well venting during well completions and workovers without hydraulic fracturing.

\* \* \* \* \*  
 EF<sub>wo</sub> = Emission Factor for non-hydraulic fracture well workover venting in standard cubic feet per workover. EF<sub>wo</sub> = 3114 standard cubic feet per well workover without hydraulic fracturing.

\* \* \* \* \*  
 V<sub>f</sub> = Average daily gas production rate in standard cubic feet per hour of each well completion without hydraulic fracturing. This is the total annual gas production volume divided by total number of hours the wells produced to the sales line. For completed wells that have not established a production rate, you may use the average flow rate from the first 30 days of production. In the event that the well is completed less than 30 days from the end of the calendar year, the first 30 days of the production straddling the current and following calendar years shall be used.

(1) Volumetric emissions for both CH<sub>4</sub> and CO<sub>2</sub> shall be calculated from volumetric natural gas emissions using calculations in paragraphs (u) of this section. Mass emissions for both CH<sub>4</sub> and CO<sub>2</sub> shall be calculated from volumetric natural gas emissions using calculations in paragraphs (v) of this section.

(2) Calculate annual emissions from gas well venting during well completions and workovers not involving hydraulic fracturing to flares as follows:

\* \* \* \* \*  
 (i) *Blowdown vent stacks.* Calculate CO<sub>2</sub> and CH<sub>4</sub> blowdown vent stack emissions from depressurizing equipment to 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 events are not included.):

\* \* \* \* \*  
 (2) If the total physical volume between isolation valves is greater than or equal to 50 cubic feet, retain logs of the number of blowdowns for each equipment type (including but not limited to compressors, vessels, pipelines, headers, fractionators, and tanks). Blowdown volumes smaller than 50 standard cubic feet are exempt from reporting under paragraph (i) of this section.

(3) \* \* \*  
 V<sub>v</sub> = Total physical volume of blowdown equipment chambers (including pipelines, compressors and vessels) between isolation valves in cubic feet.

\* \* \* \* \*  
 (4) Calculate both CH<sub>4</sub> and CO<sub>2</sub> volumetric and mass emissions using calculations in paragraph (u) and (v) of this section.

\* \* \* \* \*  
 (j) \* \* \*  
 (1) *Calculation Methodology 1.* For separators with annual average daily throughput of oil greater than or equal to 10 barrels per day. \* \* \*  
 \* \* \* \* \*

(vii) Separator oil composition and Reid vapor pressure. If this data is not available, determine these parameters by selecting one of the methods described under paragraph (j)(1)(vii) of this section.

\* \* \* \* \*  
 (2) *Calculation Methodology 2.* Calculate annual CH<sub>4</sub> and CO<sub>2</sub> emissions from onshore production storage tanks for wellhead gas-liquid separators with annual average daily throughput of oil greater than or equal to 10 barrels per day by assuming that all of the CH<sub>4</sub> and CO<sub>2</sub> in solution at separator temperature and pressure is emitted from oil sent to storage tanks. You may use an appropriate standard method published by a consensus-based standards organization if such a method exists or you may use an industry standard practice as described in § 98.234(b) to sample and analyze separator oil composition at separator pressure and temperature.

(3) *Calculation Methodology 3.* For wells with annual average daily oil production greater than or equal to 10 barrels per day that flow directly to atmospheric storage tanks without passing through a wellhead separator, calculate annual CH<sub>4</sub> and CO<sub>2</sub> emissions by either of the methods in paragraph (j)(3) of this section:

\* \* \* \* \*  
 (4) *Calculation Methodology 4.* For wells with annual average daily oil production greater than or equal to 10 barrels per day that flow to a separator not at the well pad, calculate annual CH<sub>4</sub> and CO<sub>2</sub> emissions by either of the methods in paragraph (j)(4) of this section:

\* \* \* \* \*  
 (5) \* \* \*

$$E_{s,i} = EF_i * Count * 1000 \quad (\text{Eq. W-15})$$

Where:

E<sub>s,i</sub> = Annual total volumetric GHG emissions (either CO<sub>2</sub> or CH<sub>4</sub>) at standard conditions in cubic feet.  
 EF<sub>i</sub> = Populations emission factor for separators or wells in thousand standard

cubic feet per separator or well per year, for crude oil use 4.3 for CH<sub>4</sub> and 2.9 for CO<sub>2</sub> at 68°F and 14.7 psia, and for gas condensate use 17.8 for CH<sub>4</sub> and 2.9 for CO<sub>2</sub> at 68°F and 14.7 psia.

Count = Total number of separators or wells with throughput less than 10 barrels per day.  
 1,000 = Conversion to cubic feet.

\* \* \* \* \*  
 (8) \* \* \*

$$E_{s,i} = \left( CF_n * \frac{E_n}{8760} * T_n \right) + (E_n * (8760 - T_n)) \quad (\text{Eq. W-16})$$

Where:

\* \* \* \* \*

E<sub>n</sub> = Storage tank emissions as determined in Calculation Methodologies 1, 2, or 4 in paragraphs (j)(1), (j)(2) and (j)(4) of this

section (with wellhead separators) in cubic feet per year.

\* \* \* \* \*

8,760 = Conversion to hourly emissions.

\* \* \* \* \*

(k) \* \* \*

(2) If the tank vapors are continuous for 5 minutes, or the acoustic leak detection device detects a leak, then use one of the following two methods in paragraph (k)(2) of this section to quantify annual emissions:

\* \* \* \* \*

(4) Calculate annual emissions from storage tanks to flares as follows:

(i) Use the storage tank emissions volume and gas composition as determined in paragraphs (k)(1) through (k)(3) of this section.

(ii) Use the calculation methodology of flare stacks in paragraph (n) of this section to determine storage tank emissions sent to a flare.

\* \* \* \* \*

(q) *Leak detection and leaker emission factors.* You must use the methods described in § 98.234(a) to conduct leak detection(s) of equipment leaks from all sources listed in § 98.232(d)(7), (e)(7), (f)(5), (g)(3), (h)(4), and (i)(1). This paragraph (q) applies to emissions sources in streams with gas content greater than 10 percent CH<sub>4</sub> plus CO<sub>2</sub> by weight. Emissions sources in streams with gas content less than 10 percent CH<sub>4</sub> plus CO<sub>2</sub> by weight do not need to be reported. Tubing systems equal to or less than one half inch diameter are exempt from the requirements of this paragraph (q) and do not need to be reported. If equipment leaks are detected for sources listed in this paragraph (q), calculate equipment leak emissions per source per reporting facility using Equation W-30 of this

section for each source with equipment leaks.

\* \* \* \* \*

(v) \* \* \*

ρ<sub>i</sub> = Density of GHG i. Use 0.0520 kg/ft<sup>3</sup> for CO<sub>2</sub> and N<sub>2</sub>O, and 0.0190 kg/ft<sup>3</sup> for CH<sub>4</sub> at 68°F and 14.7 psia or 0.0530 kg/ft<sup>3</sup> for CO<sub>2</sub> and N<sub>2</sub>O, and 0.0193 kg/ft<sup>3</sup> for CH<sub>4</sub> at 60°F and 14.7 psia.

\* \* \* \* \*

(z) *Onshore petroleum and natural gas production and natural gas distribution combustion emissions.* Calculate CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O combustion-related emissions from stationary or portable equipment, except as specified in paragraph (z)(3) of this section, as follows:

(2) \* \* \*

(iii) \* \* \*

$$E_{a,CO_2} = (V_a * Y_{CO_2}) + \eta * \sum_j V_a * Y_j * R_j \quad (\text{Eq. W-39A})$$

$$E_{a,CH_4} = V_a * (1 - \eta) * Y_{CH_4} \quad (\text{Eq. W-39B})$$

Where:

\* \* \* \* \*

E<sub>a,CH<sub>4</sub></sub> = Contribution of annual CH<sub>4</sub> emissions from portable or stationary fuel combustion sources in cubic feet, under actual conditions.

η = Combustion efficiency for portable and stationary equipment determined based on engineering estimation.

\* \* \* \* \*

Y<sub>j</sub> = Concentration of gas hydrocarbon constituents j (such as methane, ethane,

propane, butane, and pentanes plus) in gas sent to combustion unit.

Y<sub>CH<sub>4</sub></sub> = Concentration of methane constituent in gas sent to combustion unit.

Y<sub>CO<sub>2</sub></sub> = Concentration of CO<sub>2</sub> constituent in gas sent to combustion unit.

R<sub>j</sub> = Number of carbon atoms in the gas hydrocarbon constituent j; 1 for methane, 2 for ethane, 3 for propane, 4 for butane, and 5 for pentanes plus) in gas sent to combustion unit.

(iv) Calculate GHG volumetric emissions at standard conditions using calculations in paragraph (t) of this section.

(v) Calculate both combustion-related CH<sub>4</sub> and CO<sub>2</sub> mass emissions from volumetric CH<sub>4</sub> and CO<sub>2</sub> emissions using calculation in paragraph (v) of this section.

(vi) Calculate N<sub>2</sub>O mass emissions using Equation W-40 of this section.

$$N_2O = (1 \times 10^{-3}) \times Fuel \times HHV \times EF \quad (\text{Eq. W-40})$$

Where:

\* \* \* \* \*

HHV = For the high heat value for field gas or process vent gas, use 1.235 x 10<sup>-3</sup> mmBtu/scf for HHV.

\* \* \* \* \*

(3) External fuel combustion sources with a rated heat capacity equal to or less than 5 mmBtu/hr do not need to report combustion emissions or include these emissions for threshold determination in § 98.231(a). You must report the type and number of each external fuel combustion unit.

12. Section 98.234 is amended by revising Equation W-41 of paragraph (e) to read as follows:

**§ 98.234 Monitoring and QA/QC requirements.**

\* \* \* \* \*

(e) \* \* \*

$$p = \frac{RT}{V_m - b} - \frac{a\alpha}{V_m^2 + 2bV_m - b^2} \quad (\text{Eq. W-41})$$

Where:

p = Absolute pressure.  
R = Universal gas constant.

T = Absolute temperature.  
V<sub>m</sub> = Molar volume.

$$a = \frac{0.45724R^2T_c^2}{P_c}$$

$$b = \frac{0.7780RT_c}{P_c}$$

$$\alpha = \left( 1 + (0.37464 + 1.54226\omega - 0.26992\omega^2) \left( 1 - \sqrt{\frac{T}{T_c}} \right) \right)^2$$

Where:

$\omega$  = Acentric factor of the species.

$T_c$  = Critical temperature.

$P_c$  = Critical pressure.

\* \* \* \* \*

13. Section 98.236 is amended by revising paragraphs (c)(6)(ii)(B) and (c)(7)(i).

**§ 98.236 Data reporting requirements.**

\* \* \* \* \*

(c) \* \* \*

(6) \* \* \*

(ii) \* \* \*

(B) Total count of workovers in calendar year that flare gas or vent gas to the atmosphere.

\* \* \* \* \*

(7) \* \* \*

(i) Total number of blowdowns per unique volume type in calendar year.

\* \* \* \* \*

14. Tables W-3 and W-4 to subpart W are amended by revising the entries for “Low Continuous Bleed Pneumatic Device Vents”, “High Continuous Bleed Pneumatic Device Vents”, and “Intermittent Bleed Pneumatic Device Vents” as follows:

**TABLE W-3 TO SUBPART W OF PART 98—DEFAULT TOTAL HYDROCARBON EMISSION FACTORS FOR ONSHORE NATURAL GAS TRANSMISSION COMPRESSION**

Onshore natural gas transmission compression	Emission factor (scf/hour/component)
<b>Leaker Emission Factors—Compressor Components, Gas Service</b>	
* * * * *	*
<b>Leaker Emission Factors—Non-Compressor Components, Gas Service</b>	
* * * * *	*
<b>Population Emission Factors—Gas Service</b>	
Low Continuous Bleed Pneumatic Device Vents <sup>2</sup> .....	1.79
High Continuous Bleed Pneumatic Device Vents <sup>2</sup> .....	20.1
Intermittent Bleed Pneumatic Device Vents <sup>2</sup> .....	20.1

<sup>1</sup> Valves include control valves, block valves and regulator valves.

<sup>2</sup> Emission Factor is in units of “scf/hour/device”.

**TABLE W-4 TO SUBPART W OF PART 98—DEFAULT TOTAL HYDROCARBON EMISSION FACTORS FOR UNDERGROUND NATURAL GAS STORAGE**

Underground natural gas storage	Emission factor (scf/hour/component)
<b>Leaker Emission Factors—Storage Station, Gas Service</b>	
* * * * *	*
<b>Population Emission Factors—Storage Wellheads, Gas Service</b>	
* * * * *	*
<b>Population Emission Factors—Other Components, Gas Service</b>	
Low Continuous Bleed Pneumatic Device Vents <sup>2</sup> .....	1.79
High Continuous Bleed Pneumatic Device Vents <sup>2</sup> .....	20.1
Intermittent Bleed Pneumatic Device Vents <sup>2</sup> .....	20.1

<sup>1</sup> Valves include control valves, block valves and regulator valves.

<sup>2</sup> Emission Factor is in units of “scf/hour/device”.

**Subpart FF—[Amended]**

15. Section 98.322 is amended by revising paragraph (f) to read as follows:

**§ 98.322 GHGs to report.**

\* \* \* \* \*

(f) An underground coal mine that is subject to this part because emissions from source categories described in

Tables A-3, A-4 or A-5, or from stationary combustion (subpart C), is not required to report emissions under subpart FF of this part unless the coal mine liberates 36,500,000 actual cubic

feet (acf) or more of methane per year from its ventilation system.

- 16. Section 98.323 is amended by:
  - a. Revising the definitions of “V”, “C”, and “P” in Equation FF-1 of paragraph (a).
  - b. Revising the first sentence of paragraph (a)(2).
  - c. Revising the definitions of “Vi”, “Ci”, Ti, and “Pi” in equation FF-3 of paragraph (b).
  - d. Revising the first sentence of paragraph (b)(1).
  - e. Revising paragraph (c) introductory text.

**§ 98.323 Calculating GHG emissions.**

(a) \* \* \*

V = Volumetric flow rate for the quarter (cfm) based on sampling or a flow rate meter. If a flow rate meter is used and the meter automatically corrects for temperature and pressure, replace “520°R/T × P/1 atm” with “1”.

\* \* \* \* \*

C = CH<sub>4</sub> concentration of ventilation gas for the quarter (%).

\* \* \* \* \*

P = Pressure at which flow is measured (atm) for the quarter. The annual average barometric pressure from the nearest NOAA weather service station may be used as a default.

\* \* \* \* \*

(2) Values of V, C, T, P, and fH<sub>2</sub>O, if applicable, must be based on measurements taken at least once each quarter with no fewer than 6 weeks between measurements. \* \* \*

\* \* \* \* \*

(b) \* \* \*

Vi = Measured volumetric flow rate for the days in the week when the degasification system is in operation at that monitoring point, based on sampling or a flow rate meter (cfm). If a flow rate meter is used and the meter automatically corrects for temperature and pressure, replace “520°R/Ti × Pi/1 atm” with “1”.

\* \* \* \* \*

Ci = CH<sub>4</sub> concentration of gas for the days in the week when the degasification system is in operation at that monitoring point (%).

\* \* \* \* \*

Ti = Temperature at which flow is measured (°R).

Pi = Pressure at which flow is measured (atm).

\* \* \* \* \*

(1) Values for V, C, T, P, and fH<sub>2</sub>O, if applicable, must be based on measurements taken at least once each calendar week with at least 3 days between measurements. \* \* \*

\* \* \* \* \*

(c) If gas from degasification system wells or ventilation shafts is sold, used onsite, or otherwise destroyed

(including by flaring), you must calculate the quarterly CH<sub>4</sub> destroyed for each destruction device and each point of offsite transport to a destruction device, using Equation FF-5 of this section. You must measure CH<sub>4</sub> content and flow rate according to the provisions in § 98.324, and calculate the methane routed to the destruction device (CH<sub>4</sub>) using either Eq. FF-1 or Eq. FF-3, as applicable.

\* \* \* \* \*

17. Section 98.324 is amended by:

- a. Revising paragraphs (b)(1) and (b)(2).
- b. Revising paragraph (c).
- c. Revising paragraph (d).
- d. Revising paragraph (e) introductory text.
- e. Revising paragraphs (g) and (h).

**§ 98.324 Monitoring and QA/QC requirements.**

\* \* \* \* \*

(b) \* \* \*

(1) Collect quarterly or more frequent grab samples (with no fewer than 6 weeks between measurements) for methane concentration and make quarterly measurements of flow rate, temperature, pressure, and moisture content, if applicable. The sampling and measurements must be made at the same locations as MSHA inspection samples are taken, and should be taken when the mine is operating under normal conditions. You must follow MSHA sampling procedures as set forth in the MSHA Handbook entitled, General Coal Mine Inspection Procedures and Inspection Tracking System Handbook Number: PH-08-V-1, January 1, 2008 (incorporated by reference, see § 98.7). You must record the date of sampling, flow, temperature, pressure, and moisture measurements, the methane concentration (percent), the bottle number of samples collected, and the location of the measurement or collection.

(2) Obtain results of the quarterly (or more frequent) testing performed by MSHA for the methane flowrate. At the time and location of the MSHA sampling, make measurements of temperature, pressure and moisture content using the same procedures specified in paragraph (b)(1) of this section. If the MSHA data for methane flow is provided in the units of actual cubic feet of methane per day, the methane flow data is inserted into Equation FF-1 of this section in place of the value for V and the variables MCF, C/100%, and 1440 are removed from the equation.

\* \* \* \* \*

(c) For CH<sub>4</sub> liberated at degasification systems, determine whether CH<sub>4</sub> will be

monitored from each well and gob gas vent hole, from a centralized monitoring point, or from a combination of the two options. Operators are allowed flexibility for aggregating emissions from more than one well or gob gas vent hole, as long as emissions from all are addressed, and the methodology for calculating total emissions is documented. Monitor both gas volume and methane concentration by one of the following two options:

(1) Monitor emissions through the use of one or more continuous emissions monitoring systems (CEMS). If operators use CEMS as the basis for emissions reporting, they must provide documentation on the process for using data obtained from their CEMS to estimate emissions from their mine ventilation systems.

(2) Collect weekly (once each calendar week, with at least three days between measurements) or more frequent samples, for all degasification wells and gob gas vent holes. Determine weekly or more frequent flow rates, methane concentration, temperature, and pressure from these degasification wells and gob gas vent holes. Methane composition should be determined either by submitting samples to a lab for analysis, or from the use of methanometers at the degasification well site. Follow the sampling protocols for sampling of methane emissions from ventilation shafts, as described in § 98.324(b)(1). You must record the date of sampling, flow, temperature, pressure, and moisture measurements, the methane concentration (percent), the bottle number of samples collected, and the location of the measurement or collection.

(3) If the CH<sub>4</sub> concentration is determined on a dry basis and flow is determined on a wet basis or CH<sub>4</sub> concentration is determined on a wet basis and flow is determined on a dry basis, and the flow meter does not automatically correct for moisture content, determine the moisture content in the gas in a location near or representative of the location of:

(i) The gas flow meter at least once each calendar week; if measuring with CEMS. If only one measurement is made each calendar week, there must be at least three days between measurements; and

(ii) The grab sample, if using grab samples, at the time of the sample.

(d) Monitoring must adhere to one of the methods specified in paragraphs (d)(1) through (d)(2) of this section.

(1) ASTM D1945-03, Standard Test Method for Analysis of Natural Gas by Gas Chromatography; ASTM D1946-90 (Reapproved 2006), Standard Practice

for Analysis of Reformed Gas by Gas Chromatography; ASTM D4891–89 (Reapproved 2006), Standard Test Method for Heating Value of Gases in Natural Gas Range by Stoichiometric Combustion; or ASTM UOP539–97 Refinery Gas Analysis by Gas Chromatography (incorporated by reference, see § 98.7).

(2) As an alternative to the gas chromatography methods provided in paragraph (d)(1) of this section, you may use gaseous organic concentration analyzers and a correction factor to calculate the CH<sub>4</sub> concentration following the requirements in paragraphs (d)(2)(i) through (d)(2)(iii) of this section.

(i) Use Method 25A or 25B at 40 CFR part 60, appendix A–7 to determine gaseous organic concentration as required in § 98.323 and in paragraphs (b) and (c) of this section. You must

calibrate the instrument with CH<sub>4</sub> and determine the total gaseous organic concentration as carbon (or as CH<sub>4</sub>; K = 1 in Equation 25A–1 of Method 25A at 40 CFR part 60, appendix A–7).

(ii) Determine a correction factor that will be used with the gaseous organic concentrations measured in paragraph (i) of this section. The correction factor must be determined at the routine sampling location no less frequently than once a reporting year following the requirements in paragraphs (d)(2)(ii)(A) through (d)(2)(ii)(C) of this section.

(A) Take a minimum of three grab samples of the gas with a minimum of 20 minutes between samples and determine the methane composition of the gas using one of the methods specified in paragraph (d)(1) of this section.

(B) As soon as practical after each grab sample is collected and prior to the

collection of a subsequent grab sample, determine the gaseous organic concentration of the gas using either Method 25A or 25B at 40 CFR part 60, appendix A–7 as specified in paragraph (d)(2)(i) of this section.

(C) Determine the arithmetic average methane concentration and the arithmetic average gaseous organic concentration of the samples analyzed according to paragraphs (d)(2)(ii)(A) and (d)(2)(ii)(B) of this section, respectively, and calculate the non-methane organic carbon correction factor as the ratio of the average methane concentration to the average total gaseous organic concentration. If the ratio exceeds 1, use 1 for the correction factor.

(iii) Calculate the CH<sub>4</sub> concentration as specified in Equation FF–9 of this section:

C<sub>CH4</sub> = f<sub>NMOC</sub> × C<sub>TGOC</sub> (Eq. FF–9)

Where:

C<sub>CH4</sub> = Methane (CH<sub>4</sub>) concentration in the gas (volume %) for use in Equations FF–1 and FF–3 of this subpart.

f<sub>NMOC</sub> = Correction factor from the most recent determination of the correction factor as specified in paragraph (d)(2)(ii) of this section (unitless).

C<sub>TGOC</sub> = Gaseous organic carbon concentration measured using Method 25A or 25B at 40 CFR part 60, appendix A–7 during routine monitoring of the gas (volume %).

(e) All flow meters and gas composition monitors that are used to provide data for the GHG emissions calculations shall be calibrated prior to the first reporting year, using the applicable methods specified in paragraphs (d), and (e)(1) through (e)(7) of this section. Alternatively, calibration procedures specified by the flow meter manufacturer may be used. Flow meters and gas composition monitors shall be recalibrated either at the minimum frequency specified by the manufacturer or annually. The operator shall operate, maintain, and calibrate a gas composition monitor capable of measuring the concentration of CH<sub>4</sub> in the gas using one of the methods specified in paragraph (d) of this section. The operator shall operate, maintain, and calibrate the flow meter using any of the following test methods or follow the procedures specified by the flow meter manufacturer. Flow meters must meet the accuracy requirements in § 98.3(i).

(g) All temperature, pressure, and moisture content monitors must be

operated and calibrated using the procedures and frequencies specified by the manufacturer.

(h) If applicable, the owner or operator shall document the procedures used to ensure the accuracy of gas flow rate, gas composition, temperature, pressure, and moisture content measurements. These procedures include, but are not limited to, calibration of flow meters, and other measurement devices. The estimated accuracy of measurements, and the technical basis for the estimated accuracy shall be recorded.

18. Section 98.325 is amended by revising the first sentence of paragraph (b) as follows:

§ 98.325 Procedures for estimating missing data.

\* \* \* \* \*

(b) For each missing value of CH<sub>4</sub> concentration, flow rate, temperature, pressure, and moisture content for ventilation and degasification systems, the substitute data value shall be the arithmetic average of the quality-assured values of that parameter immediately preceding and immediately following the missing data incident. \* \* \*

Section 98.326 is amended by:

- a. Revising paragraph (f).
b. Revising paragraph (h).
c. Revising paragraph (j).
d. Revising paragraph (k).
e. Revising paragraph (o).

§ 98.326 Data reporting requirements.

\* \* \* \* \*

(f) Quarterly volumetric flow rate for each ventilation monitoring point

(scfm), date and location of each measurement, and method of measurement (quarterly sampling or continuous monitoring), used in Equation FF–1.

\* \* \* \* \*

(h) Weekly volumetric flow rate used to calculate CH<sub>4</sub> liberated from degasification systems (cfm) and method of measurement (sampling or continuous monitoring), used in Equation FF–3.

\* \* \* \* \*

(j) Weekly volumetric flow rate used to calculate CH<sub>4</sub> destruction for each destruction device and each point of offsite transport (cfm).

(k) Weekly CH<sub>4</sub> concentration (%) used to calculate CH<sub>4</sub> flow to each destruction device and each point of offsite transport (C).

\* \* \* \* \*

(o) Temperatures (°R), pressure (atm), and moisture content used in Eq. FF–1 and FF–3, and the gaseous organic concentration correction factor, if Equation FF–9 was required.

\* \* \* \* \*

Subpart II—[Amended]

19. Section 98.350 is amended by revising the first sentence of paragraph (b) introductory text to read as follows:

§ 98.350 Definition of Source Category

\* \* \* \* \*

(b) An anaerobic process is a procedure in which organic matter in wastewater, wastewater treatment sludge, or other material is degraded by

micro-organisms in the absence of oxygen, resulting in the generation of CO<sub>2</sub> and CH<sub>4</sub>. \* \* \*

20. Section 98.352 is amended by revising paragraph (d) as follows:

**§ 98.352 GHGs to report.**

(d) You must report under subpart C of this part (General Stationary Fuel Combustion Sources) the emissions of CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O from each stationary combustion unit associated with the biogas destruction device, if present, by following the requirements of subpart C of this part.

- 21. Section 98.353 is amended by:
  - a. Revising paragraph (a)(2).
  - b. Revising paragraph (c) introductory text and paragraph (c)(1) introductory text.
  - c. Revising the definitions of “R<sub>n</sub>”, “T<sub>m</sub>”, and “P<sub>m</sub>” in Equation II–4 of paragraph (c)(1).
  - d. Revising paragraph (c)(2).
  - e. Revising paragraph (d) introductory text.
  - f. Revising the definition of “R<sub>n</sub>” in Equation II–5 in paragraph (d)(1).
  - g. Revising Equation II–6 and revising the definition of “CH<sub>4</sub>E<sub>n</sub>”, “R<sub>n</sub>”, “DE<sub>1</sub>”, and “f<sub>Dest\_1</sub>” in paragraph (d)(2).

**§ 98.353 Calculating GHG emissions.**

(a) \* \* \*

(2) If you measure the concentration of organic material entering an anaerobic reactor or anaerobic lagoon using methods for the determination of 5-day biochemical oxygen demand (BOD<sub>5</sub>), then estimate annual mass of CH<sub>4</sub> generated using Equation II–2 of this section.

(c) For each anaerobic sludge digester, anaerobic reactor, or anaerobic lagoon from which some biogas is recovered, estimate the annual mass of CH<sub>4</sub> recovered according to the requirements in paragraphs (c)(1) and (c)(2) of this section. To estimate the annual mass of CH<sub>4</sub> recovered, you must continuously monitor biogas flow rate and determine the volume of biogas each week and the cumulative volume of biogas each year that is collected and routed to a destruction device as specified in § 98.354(h). If the gas flow meter is not

equipped with automatic correction for temperature, pressure, or, if necessary, moisture content, you must determine these parameters as specified in paragraph (c)(2)(ii) of this section.

(1) If you continuously monitor CH<sub>4</sub> concentration (and if necessary, temperature, pressure, and moisture content required as specified in § 98.354(f)) of the biogas that is collected and routed to a destruction device using a monitoring meter specifically for CH<sub>4</sub> gas, as specified in § 98.354(g), you must use this monitoring system and calculate the quantity of CH<sub>4</sub> recovered for destruction using Equation II–4 of this section. A fully integrated system that directly reports CH<sub>4</sub> quantity requires only the summing of results of all monitoring periods for a given year.

R<sub>n</sub> = Annual quantity of CH<sub>4</sub> recovered from the nth anaerobic reactor, sludge digester, or lagoon (metric tons CH<sub>4</sub>/yr)

T<sub>m</sub> = Average temperature at which flow is measured for the measurement period (°R). If the flow rate meter automatically corrects for temperature to 520° R, replace “520° R/T<sub>m</sub>” with “1”.

P<sub>m</sub> = Average pressure at which flow is measured for the measurement period (atm). If the flow rate meter automatically corrects for pressure to 1 atm, replace “P<sub>m</sub>/1” with “1”.

(2) If you do not continuously monitor CH<sub>4</sub> concentration according to paragraph(c)(1) of this section, you must determine the CH<sub>4</sub> concentration, temperature, pressure, and, if necessary, moisture content of the biogas that is collected and routed to a destruction device according to the requirements in paragraphs (c)(2)(i) through (c)(2)(ii) of this section and calculate the quantity of CH<sub>4</sub> recovered for destruction using Equation II–4 of this section.

(i) Determine the CH<sub>4</sub> concentration in the biogas that is collected and routed to a destruction device in a location near or representative of the location of the gas flow meter at least once each calendar week; if only one measurement is made each calendar week, there must be least three days between measurements. For a given calendar week, you are not required to determine

CH<sub>4</sub> concentration if the cumulative volume of biogas for that calendar week, determined as specified in paragraph (c) of this section, is zero.

(ii) If the gas flow meter is not equipped with automatic correction for temperature, pressure, or, if necessary, moisture content:

(A) Determine the temperature and pressure in the biogas that is collected and routed to a destruction device in a location near or representative of the location of the gas flow meter at least once each calendar week; if only one measurement is made each calendar week, there must be at least three days between measurements.

(B) If the CH<sub>4</sub> concentration is determined on a dry basis and biogas flow is determined on a wet basis, or CH<sub>4</sub> concentration is determined on a wet basis and biogas flow is determined on a dry basis, and the flow meter does not automatically correct for moisture content, determine the moisture content in the biogas that is collected and routed to a destruction device in a location near or representative of the location of the gas flow meter at least once each calendar week that the cumulative biogas flow measured as specified in § 98.354(h) is greater than zero; if only one measurement is made each calendar week, there must be at least three days between measurements.

(d) For each anaerobic sludge digester, anaerobic reactor, or anaerobic lagoon from which some quantity of biogas is recovered, you must estimate both the annual mass of CH<sub>4</sub> that is generated, but not recovered, according to paragraph (d)(1) of this section and the annual mass of CH<sub>4</sub> emitted according to paragraph (d)(2) of this section.

(1) \* \* \*

R<sub>n</sub> = Annual quantity of CH<sub>4</sub> recovered from the nth anaerobic reactor, anaerobic lagoon, or anaerobic sludge digester, as calculated in Equation II–4 of this section (metric tons CH<sub>4</sub>).

(2) For each anaerobic sludge digester, anaerobic reactor, or anaerobic lagoon from which some quantity of biogas is recovered, estimate the annual mass of CH<sub>4</sub> emitted using Equation II–6 of this section.

$$CH_4E_n = CH_4L_n + R_n (1 - [(DE_1 * f_{Dest_1}) + (DE_2 * f_{Dest_2})]) \quad (Eq. II-6)$$

Where:

CH<sub>4</sub>E<sub>n</sub> = Annual quantity of CH<sub>4</sub> emitted from the process n from which biogas is recovered (metric tons).

R<sub>n</sub> = Annual quantity of CH<sub>4</sub> recovered from the nth anaerobic reactor or anaerobic sludge digester, as calculated in Equation II–4 of this section (metric tons CH<sub>4</sub>).

DE<sub>1</sub> = Primary destruction device CH<sub>4</sub> destruction efficiency (lesser of manufacturer’s specified destruction efficiency and 0.99). If the biogas is



transported off-site for destruction, use DE=1.  
f<sub>Dest,1</sub> = Fraction of hours the primary destruction device was operating (device operating hours/hours in the year). If the biogas is transported off-site for destruction, use f<sub>Dest</sub>=1.

- \* \* \* \* \*
- 22. Section 98.354 is amended by:
  - a. Revising the second sentence of paragraph (c).
  - b. Revising paragraph (d) introductory text.
  - c. Revising paragraph (f).
  - d. Revising paragraph (g) introductory text.
  - e. Revising paragraph (h) introductory text and paragraph (h)(5).
  - f. Revising paragraph (k).

**§ 98.354 Monitoring and QA/QC requirements.**

(c) \* \* \* You must collect and analyze samples for COD or BOD<sub>5</sub> concentration at least once each calendar week that the anaerobic wastewater treatment process is operating; if only one measurement is made each calendar week, there must be at least three days between measurements. \* \* \*

(d) You must measure the flowrate of wastewater entering anaerobic wastewater treatment process at least once each calendar week that the process is operating; if only one measurement is made each calendar week, there must be at least three days between measurements. You must measure the flowrate for the 24-hour period for which you collect samples analyzed for COD or BOD<sub>5</sub> concentration. The flow measurement location must correspond to the location used to collect samples analyzed for COD or BOD<sub>5</sub> concentration. You must measure the flowrate using one of the methods specified in paragraphs (d)(1) through (d)(5) of this section or as specified by the manufacturer.

\* \* \* \* \*

(f) For each anaerobic process (such as anaerobic reactor, sludge digester, or lagoon) from which biogas is recovered, you must make the measurements or determinations specified in paragraphs (f)(1) through (f)(3) of this section.

(1) You must continuously measure the biogas flow rate as specified in paragraph (h) of this section and determine the cumulative volume of biogas recovered.

(2) You must determine the CH<sub>4</sub> concentration of the recovered biogas as specified in paragraph (g) of this section at a location near or representative of the location of the gas flow meter. You must determine CH<sub>4</sub> concentration either continuously or intermittently. If

you determine the concentration intermittently, you must determine the concentration at least once each calendar week that the cumulative biogas flow measured as specified in paragraph (h) of this section is greater than zero, with at least three days between measurements.

(3) As specified in § 98.353(c) and paragraph (h) of this section, you must determine temperature, pressure, and moisture content as necessary to accurately determine the biogas flow rate and CH<sub>4</sub> concentration. You must determine temperature and pressure if the gas flow meter or gas composition monitor do not automatically correct for temperature or pressure. You must measure moisture content of the recovered biogas if the biogas flow rate is measured on a wet basis and the CH<sub>4</sub> concentration is measured on a dry basis. You must also measure the moisture content of the recovered biogas if the biogas flow rate is measured on a dry basis and the CH<sub>4</sub> concentration is measured on a wet basis.

(g) For each anaerobic process (such as an anaerobic reactor, sludge digester, or lagoon) from which biogas is recovered, operate, maintain, and calibrate a gas composition monitor capable of measuring the concentration of CH<sub>4</sub> in the recovered biogas using one of the methods specified in paragraphs (g)(1) through (g)(6) of this section or as specified by the manufacturer.

\* \* \* \* \*

(h) For each anaerobic process (such as an anaerobic reactor, sludge digester, or lagoon) from which biogas is recovered, install, operate, maintain, and calibrate a gas flow meter capable of continuously measuring the volumetric flow rate of the recovered biogas using one of the methods specified in paragraphs (h)(1) through (h)(8) of this section or as specified by the manufacturer. Recalibrate each gas flow meter either biennially (every 2 years) or at the minimum frequency specified by the manufacturer. Except as provided in § 98.353(c)(2)(iii), each gas flow meter must be capable of correcting for the temperature and pressure and, if necessary, moisture content.

(5) ASME MFC-11M-2006 Measurement of Fluid Flow by Means of Coriolis Mass Flowmeters (incorporated by reference, see § 98.7). The mass flow must be corrected to volumetric flow based on the measured temperature, pressure, and biogas composition.

\* \* \* \* \*

(k) If applicable, the owner or operator must document the procedures used to ensure the accuracy of

measurements of COD or BOD<sub>5</sub> concentration, wastewater flow rate, biogas flow rate, biogas composition, temperature, pressure, and moisture content. These procedures include, but are not limited to, calibration of gas flow meters, and other measurement devices. The estimated accuracy of measurements made with these devices must also be recorded, and the technical basis for these estimates must be documented.

23. Section 98.355 is amended by revising paragraph (b) to read as follows:

**§ 98.355 Procedures for estimating missing data.**

\* \* \* \* \*

(b) For each missing value of the CH<sub>4</sub> content or biogas flow rates, the substitute data value must be the arithmetic average of the quality-assured values of that parameter immediately preceding and immediately following the missing data incident.

\* \* \* \* \*

24. Section 98.356 is amended by:
a. Revising paragraph (a) introductory text.

b. Revising paragraphs (b)(3) and (b)(4).

c. Revising paragraph (d) introductory text and paragraphs (d)(2), (d)(4), (d)(6), and (d)(8).

**§ 98.356 Data reporting requirements.**

(a) A description or diagram of the industrial wastewater treatment system, identifying the processes used to treat industrial wastewater and industrial wastewater treatment sludge. Indicate how the processes are related to each other and identify the anaerobic processes. Provide a unique identifier for each anaerobic process, indicate the average depth in meters of each anaerobic lagoon, and indicate whether biogas generated by each anaerobic process is recovered. The anaerobic processes must be identified as:

\* \* \* \* \*

(b) \* \* \*

(3) Maximum CH<sub>4</sub> production potential (B<sub>0</sub>) used as an input to Equation II-1 or II-2 of this subpart, from Table II-1.

(4) Methane conversion factor (MCF) used as an input to Equation II-1 or II-2 of this subpart, from Table II-1.

\* \* \* \* \*

(d) For each anaerobic wastewater treatment process and anaerobic sludge digester from which some biogas is recovered, you must report:

\* \* \* \* \*

(2) Total weekly volumetric biogas flow for each week (up to 52 weeks/

year) that biogas is collected for destruction.

\* \* \* \* \*

(4) Weekly average biogas temperature for each week at which flow is measured for biogas collected for destruction, or statement that temperature is incorporated into monitoring equipment internal calculations.

\* \* \* \* \*

(6) Weekly average biogas pressure for each week at which flow is measured for biogas collected for destruction, or statement that pressure is incorporated into monitoring equipment internal calculations.

\* \* \* \* \*

(8) Whether destruction occurs at the facility or off-site. If destruction occurs at the facility, also report whether a back-up destruction device is present at the facility, the annual operating hours for the primary destruction device, the annual operating hours for the back-up destruction device (if present), the destruction efficiency for the primary destruction device, and the destruction efficiency for the back-up destruction device (if present).

\* \* \* \* \*

**Subpart OO—[Amended]**

25. Section 98.416 is amended by removing and reserving paragraphs (a)(8) and (a)(9) and revising paragraph (a)(10) to read as follows:

**§ 98.416 Data reporting requirements.**

\* \* \* \* \*

(a) \* \* \*

(8) [Reserved]

(9) [Reserved]

(10) Mass in metric tons of any fluorinated GHG or nitrous oxide fed into the transformation process, by process.

\* \* \* \* \*

26. Section 98.417 is amended by adding paragraphs (a)(3) and (a)(4) to read as follows:

**§ 98.417 Records that must be retained.**

(a) \* \* \*

(3) Dated records of the total mass in metric tons of each reactant fed into the F-GHG or nitrous oxide production process, by process.

(4) Dated records of the total mass in metric tons of the reactants, by-products, and other wastes permanently removed from the F-GHG or nitrous oxide production process, by process.

\* \* \* \* \*

**Subpart RR—[Amended]**

27. Section 98.442 is amended by revising paragraphs (e) and (f) to read as follows:

**§ 98.442 GHGs to report.**

\* \* \* \* \*

(e) Mass of CO<sub>2</sub> emissions from equipment leaks and vented emissions of CO<sub>2</sub> from surface equipment located between the injection flow meter and the injection wellhead.

(f) Mass of CO<sub>2</sub> emissions from equipment leaks and vented emissions of CO<sub>2</sub> from surface equipment located between the production flow meter and the production wellhead.

\* \* \* \* \*

28. Section 98.443 is amended by:

a. Revising paragraph (d) introductory text.

b. Revising paragraph (d)(3).

c. Revising the definition of “CO<sub>2FI</sub>” and “CO<sub>2FP</sub>” in Equation RR-11 of paragraph (f)(1).

d. Revising the definition of “CO<sub>2FI</sub>” in Equation RR-12 of paragraph (f)(2).

**§ 98.443 Calculating CO<sub>2</sub> geologic sequestration.**

\* \* \* \* \*

(d) You must calculate the annual mass of CO<sub>2</sub> produced from oil or gas production wells or from other fluid wells for each separator that sends a stream of gas into a recycle or end use system in accordance with the procedures specified in paragraphs (d)(1) through (d)(3) of this section. You must account for any CO<sub>2</sub> that is produced and not processed through a separator. You must account only for wells that produce the CO<sub>2</sub> that was injected into the well or wells covered by this source category.

\* \* \* \* \*

(3) To aggregate production data, you must sum the mass of all of the CO<sub>2</sub> separated at each gas-liquid separator in accordance with the procedure specified in Equation RR-9 of this section. You must assume that the total CO<sub>2</sub> measured at the separator(s) represents a percentage of the total CO<sub>2</sub> produced. In order to account for the percentage of CO<sub>2</sub> produced that is estimated to remain with the produced oil or other fluid, you must multiply the quarterly mass of CO<sub>2</sub> measured at the separator(s) by a percentage estimated using a methodology in your approved MRV plan. If fluids containing CO<sub>2</sub> from injection wells covered under this source category are produced and not processed through a gas-liquid separator, the concentration of CO<sub>2</sub> in the produced fluids must be measured at a flow meter located prior to

re-injection or reuse using methods in § 98.444(f)(1). The considerations you intend to use to calculate CO<sub>2</sub> from produced fluids for the mass balance equation must be described in your approved MRV plan in accordance with § 98.448(d)(5).

\* \* \* \* \*

(f) \* \* \*

(1) \* \* \*

CO<sub>2FI</sub> = Total annual CO<sub>2</sub> mass emitted (metric tons) from equipment leaks and vented emissions of CO<sub>2</sub> from equipment located on the surface between the flow meter used to measure injection quantity and the injection wellhead, for which a calculation procedure is provided in subpart W of this part.

CO<sub>2FP</sub> = Total annual CO<sub>2</sub> mass emitted (metric tons) from equipment leaks and vented emissions of CO<sub>2</sub> from equipment located on the surface between the production wellhead and the flow meter used to measure production quantity, for which a calculation procedure is provided in subpart W of this part.

\* \* \* \* \*

(2) \* \* \*

CO<sub>2FI</sub> = Total annual CO<sub>2</sub> mass emitted (metric tons) from equipment leaks and vented emissions of CO<sub>2</sub> from equipment located on the surface between the flow meter used to measure injection quantity and the injection wellhead.

29. Section 98.444 is amended by revising the heading of paragraph (d) to read as follows:

**§ 98.444 Monitoring and QA/QC requirements.**

\* \* \* \* \*

(d) *CO<sub>2</sub> emissions from equipment leaks and vented emissions of CO<sub>2</sub>.*

\* \* \*

\* \* \* \* \*

30. Section 98.445 is amended by revising paragraph (e) to read as follows:

**§ 98.445 Procedures for estimating missing data.**

\* \* \* \* \*

(e) For any values associated with CO<sub>2</sub> emissions from equipment leaks and vented emissions of CO<sub>2</sub> from surface equipment at the facility that are reported in this subpart, missing data estimation procedures should be followed in accordance with those specified in subpart W of this part.

\* \* \* \* \*

31. Section 98.446 is amended by:

a. Revising paragraph (a)(2) introductory text and (a)(3) introductory text.

b. Revising paragraph (e).

c. Revising paragraph (f) introductory text.

d. Revising paragraph (f)(1)(vii).

e. Revising paragraphs (f)(3).

**§ 98.446 Data reporting requirements.**

(a) \* \* \*  
 (2) If a volumetric flow meter is used to receive CO<sub>2</sub> report the following unless you reported yes to paragraph (a)(4) of this section:  
 \* \* \* \* \*

(3) If a mass flow meter is used to receive CO<sub>2</sub> report the following unless you reported yes to paragraph (a)(4) of this section:  
 \* \* \* \* \*

(e) Report the date that you began collecting data for calculating total amount sequestered according to § 98.448(a)(7) of this subpart.

(f) Report the following. If the date specified in paragraph (e) of this section is during the reporting year for this annual report, report the following starting on the date specified in paragraph (e) of this section.

(1) \* \* \*  
 (vii) The standard used to calculate each value in paragraphs (f)(1)(ii) through (f)(1)(iv) of this section.  
 \* \* \* \* \*

(3) For CO<sub>2</sub> emissions from equipment leaks and vented emissions of CO<sub>2</sub>, report the following:

(i) The mass of CO<sub>2</sub> emitted (in metric tons) annually from equipment leaks and vented emissions of CO<sub>2</sub> from equipment located on the surface between the flow meter used to measure injection quantity and the injection wellhead.

(ii) The mass of CO<sub>2</sub> emitted (in metric tons) annually from equipment leaks and vented emissions of CO<sub>2</sub> from equipment located on the surface between the production wellhead and the flow meter used to measure production quantity.  
 \* \* \* \* \*

32. Section 98.447 is amended by revising paragraphs (a)(5) and (a)(6) to read as follows:

**§ 98.447 Records that must be retained.**

(a) \* \* \*  
 (5) Annual records of information used to calculate the CO<sub>2</sub> emitted from equipment leaks and vented emissions of CO<sub>2</sub> from equipment located on the surface between the flow meter used to measure injection quantity and the injection wellhead.

(6) Annual records of information used to calculate the CO<sub>2</sub> emitted from equipment leaks and vented emissions of CO<sub>2</sub> from equipment located on the surface between the production wellhead and the flow meter used to measure production quantity.  
 \* \* \* \* \*

33. Section 98.448 is amended by revising paragraphs (a)(5) and (e) to read as follows:

**§ 98.448 Geologic sequestration monitoring, reporting, and verification (MRV) plan.**

(a) \* \* \*  
 (5) A summary of the considerations you intend to use to calculate site-specific variables for the mass balance equation. This includes, but is not limited to, considerations for calculating CO<sub>2</sub> emissions from equipment leaks and vented emissions of CO<sub>2</sub> between the injection flow meter and injection well and/or the production flow meter and production well, and considerations for calculating CO<sub>2</sub> in produced fluids.  
 \* \* \* \* \*

(e) *Revised MRV plan.* The requirements of paragraph (c) of this section apply to any submission of a revised MRV plan. You must continue reporting under your currently approved plan while awaiting approval of a revised MRV plan.  
 \* \* \* \* \*

34. Section 98.449 is amended by revising the definition of “CO<sub>2</sub> received” to read as follows:

**§ 98.449 Definitions.**

\* \* \* \* \*  
*CO<sub>2</sub> received* means the CO<sub>2</sub> stream that you receive to be injected for the first time into a well on your facility that is covered by this subpart. CO<sub>2</sub> received includes, but is not limited to, a CO<sub>2</sub> stream from a production process unit inside your facility and a CO<sub>2</sub> stream that was injected into a well on another facility, removed from a discontinued enhanced oil or natural gas or other production well, and transferred to your facility.  
 \* \* \* \* \*

**Subpart TT—[Amended]**

35. Section 98.460 is amended by revising paragraphs (c)(1) and (c)(2)(i) to read as follows:

**§ 98.460 Definition of the source category.**

\* \* \* \* \*  
 (c) \* \* \*  
 (1) Construction and demolition waste landfills.  
 (2) \* \* \*  
 (i) Coal combustion or incinerator ash (e.g., fly ash).  
 \* \* \* \* \*

36. Section 98.463 is amended by:  
 a. In paragraph (a)(1), revising Equation TT-1 and revising the definitions of “G<sub>CH<sub>4</sub>”, “DOC<sub>x</sub>”, “MCF”, and “F<sub>x</sub>”.</sub>

b. Revising paragraph (a)(2) introductory text.  
 c. Revising paragraph (a)(2)(ii)(C).  
 d. In paragraph (a)(2)(ii)(C), revising the definitions of “W<sub>x</sub>”, “LFC”, and “YrData” in Equation TT-4.

**§ 98.463 Calculating GHG emissions.**

(a) \* \* \*  
 (1) \* \* \*

$$G_{CH4} = \left[ \sum_{x=S}^{T-1} \left\{ W_x \times DOC_x \times MCF \times DOC_F \times F \times \frac{16}{12} \times \left( e^{-k(T-x-1)} - e^{-k(T-x)} \right) \right\} \right] \text{ (Eq. TT-1)}$$

Where:

G<sub>CH<sub>4</sub></sub> = Modeled methane generation in reporting year T (metric tons CH<sub>4</sub>).  
 \* \* \* \* \*

DOC<sub>x</sub> = Degradable organic carbon for waste disposed in year X from Table TT-1 of this subpart or from measurement data [as specified in paragraph (a)(3) of this section], if available [fraction (metric tons C/metric ton waste)].  
 \* \* \* \* \*

MCF = Methane correction factor (fraction). Use the default value of 1 unless there is active aeration of waste within the

landfill during the reporting year. If there is active aeration of waste within the landfill during the reporting year, use either the default value of 1 or select an alternative value no less than 0.5 based on site-specific aeration parameters.  
 F = Fraction by volume of CH<sub>4</sub> in landfill gas (fraction, dry basis, corrected to 0% oxygen). If you have a gas collection system, use the annual average CH<sub>4</sub> concentration from measurement data for the current reporting year; otherwise, use the default value of 0.5.  
 \* \* \* \* \*

(2) *Waste stream quantities.* Determine annual waste quantities as specified in paragraphs (a)(2)(i) through (ii) of this section for each year starting with January 1, 1960 or the year the landfills first accepted waste if after January 1, 1960, up until the most recent reporting year. The choice of method for determining waste quantities will vary according to the availability of historical data. Beginning in the first emissions reporting year (2011 or later) and for each year thereafter, use the

procedures in paragraph (a)(2)(i) of this section to determine waste stream quantities. These procedures should also be used for any year prior to the first emissions reporting year for which the data are available. For other historical years, use paragraph (a)(2)(i) of this section, where waste disposal records are available, and use the procedures outlined in paragraph (a)(2)(ii) of this section when waste disposal records are unavailable, to determine waste stream quantities. Historical disposal quantities deposited (*i.e.*, prior to the first year in which monitoring begins) should only be determined once, as part of the first annual report, and the same values should be used for all subsequent annual reports, supplemented by the next year's data on new waste disposal.

\* \* \* \* \*

(ii) \* \* \*

(C) For any year in which historic production or processing data are not available such that historic waste quantities cannot be estimated using Equation TT-3 of this section, calculate an average annual bulk waste disposal quantity using Equation TT-4 of this section.

\* \* \* \* \*

$$DOC_x = F_{DOC} \times \frac{\% \text{ Volatile Solids}_x}{100\%} \times \frac{\% \text{ Total Solids}_x}{100\%}$$

(Eq. TT-7)

\* \* \* \* \*

% Volatile Solids<sub>x</sub> = Percent volatile solids determined using Standard Method 2540G "Total, Fixed, and Volatile Solids in Solid and Semisolid Samples" (incorporated by reference; see § 98.7) for Year X [milligrams (mg) volatile solids per 100 mg dried solids].

% Total Solids<sub>x</sub> = Percent total solids determined using Standard Method 2540G "Total, Fixed, and Volatile Solids in Solid and Semisolid Samples" (incorporated by reference; see § 98.7) for Year X (mg dried solids per 100 mg wet waste).

(c) For each waste stream for which you choose to determine volatile solids concentration for the purposes of paragraph § 98.460(c)(2)(xii), and that was historically managed in the landfill but was not received during the first reporting year, you must determine volatile solids concentration of the waste stream as initially placed in the landfill using the methods specified in paragraph (c)(1) or (c)(2) of this section, as applicable.

(1) If you can identify a similar waste stream to the waste stream that was historically managed in the landfill, you

W<sub>x</sub> = Quantity of waste placed in the landfill in year X (metric tons, wet basis). This annual bulk waste disposal quantity applies for all years from "YrOpen" to "YrData" inclusive.

LFC = Capacity of the landfill used (or the total quantity of waste-in-place) at the end of the "YrData" from design drawings or engineering estimates (metric tons). For closed landfills for which waste quantity data are not available, use the landfill's design capacity.

YrData = The year prior to the year when waste disposal data are first available from company records or from Equation TT-3 of this section. For landfills for which waste quantity data are not available, the year in which the landfill last received waste.

\* \* \* \* \*

37. Section 98.464 is amended by:

a. Revising paragraph (b) introductory text.

b. Revising paragraph (b)(1).

c. Revising paragraph (b)(3).

d. In paragraph (b)(4), revising the first sentence, redesignating Equation TT-8 as Equation TT-7, and revising the definition of "% Volatile Solids<sub>x</sub>" and "% Total Solids<sub>x</sub>".

e. Redesignating paragraphs (c), (d), (e) and (f) as paragraphs (d), (e), and (f) and (h) respectively.

f. Adding paragraph (c).

g. Adding paragraph (g).

**§ 98.464 Monitoring and QA/QC requirements.**

\* \* \* \* \*

(b) For each waste stream received during the reporting year for which you choose to determine volatile solids concentration for the purposes of § 98.460(c)(2)(xii) or choose to determine a landfill-specific DOC<sub>x</sub> for use in Equation TT-1 of this subpart, you must collect and test a representative sample of that waste stream using the methods specified in paragraphs (b)(1) through (b)(4) of this section.

(1) Develop and follow a sampling plan to collect a representative sample of each waste stream (as received at the landfill) for which testing is elected.

\* \* \* \* \*

(3) For the purposes of § 98.460(c)(2)(xii), the volatile solids concentration (weight percent on a dry basis) is the percent volatile solids determined using Standard Method 2540G "Total, Fixed, and Volatile Solids in Solid and Semisolid Samples" (incorporated by reference; see § 98.7).

(4) Calculate the waste stream-specific DOC<sub>x</sub> value using Equation TT-7 of this section.

must determine the volatile solids concentration of the similar waste stream using the procedures in paragraphs (b)(1) through (b)(3) of this section.

(2) If you cannot identify a similar waste stream to the waste stream that was historically managed in the landfill, you may determine the volatile solids concentration of the historically managed waste stream using process knowledge. You must document the basis for volatile solids concentration as determined through process knowledge.

(d) For landfills with gas collection systems, operate, maintain, and calibrate a gas composition monitor capable of measuring the concentration of CH<sub>4</sub> according to the requirements specified at § 98.344(b).

(e) For landfills with gas collection systems, install, operate, maintain, and calibrate a gas flow meter capable of measuring the volumetric flow rate of the recovered landfill gas according to the requirements specified at § 98.344(c).

(f) For landfills with gas collection systems, all temperature, pressure, and

if applicable, moisture content monitors must be calibrated using the procedures and frequencies specified by the manufacturer.

(g) For landfills electing to measure the fraction by volume of CH<sub>4</sub> in landfill gas (F), follow the requirements in paragraphs (g)(1) and (g)(2) of this section.

(1) Use a gas composition monitor capable of measuring the concentration of CH<sub>4</sub> on a dry basis that is properly operated, calibrated, and maintained according to the requirements specified at § 98.344(b). You must either use a gas composition monitor that is also capable of measuring the O<sub>2</sub> concentration correcting for excess (infiltration) air or you must operate, maintain, and calibrate a second monitor capable of measuring the O<sub>2</sub> concentration on a dry basis according to the manufacturer's specifications.

(2) Use Equation TT-8 of this section to correct the measured CH<sub>4</sub> concentration to 0% oxygen. If multiple CH<sub>4</sub> concentration measurements are made during the reporting year, determine F separately for each

measurement made during the reporting year, and use the results to determine the arithmetic average value of F for use in Equation TT-1 of this part.

$$F = \left( \frac{C_{CH_4}}{100\%} \right) \times \left[ \frac{20.9}{20.9 - \%O_2} \right] \quad (\text{Eq. TT-8})$$

Where:

F = Fraction by volume of CH<sub>4</sub> in landfill gas (fraction, dry basis, corrected to 0% oxygen).

C<sub>CH<sub>4</sub></sub> = Measured CH<sub>4</sub> concentration in landfill gas (volume %, dry basis).

20.9<sub>c</sub> = Defined O<sub>2</sub> correction basis, (volume %, dry basis).

20.9 = O<sub>2</sub> concentration in air (volume %, dry basis).

%O<sub>2</sub> = Measured O<sub>2</sub> concentration in landfill gas (volume %, dry basis).

(h) The facility shall document the procedures used to ensure the accuracy of the estimates of disposal quantities and, if the industrial waste landfill has a gas collection system, gas flow rate, gas composition, temperature, pressure, and moisture content measurements. These procedures include, but are not limited to, calibration of weighing equipment, fuel flow meters, and other measurement devices. The estimated accuracy of measurements made with these devices shall also be recorded, and the technical basis for these estimates shall be provided.

38. Section 98.466 is amended by:

- a. Revising paragraph (b) introductory text.
- b. Revising paragraph (b)(2).
- c. Adding paragraphs (b)(3) and (b)(4).
- d. Revising paragraph (c)(3)(ii).
- e. Revising paragraph (d).
- f. Revising paragraph (f).
- g. Revising paragraph (g)(1).

**§ 98.466 Data reporting requirements.**

(b) Report the following waste characterization and modeling information:

(2) A description of each waste stream (including the types of materials in each waste stream) for which Equation TT-1 of this subpart is used to calculate modeled CH<sub>4</sub> generation.

(3) The fraction of CH<sub>4</sub> in the landfill gas, F, (volume fraction, dry basis, corrected to 0% oxygen) for the reporting year and an indication as to whether this was the default value or a value determined through measurement data.

(4) The methane correction factor (MCF) value used in the calculations. If

an MCF value other than the default of 1 is used, provide a description of the aeration system, including aeration blower capacity, the fraction of the landfill containing waste affected by the aeration, the total number of hours during the year the aeration blower was operated, and other factors used as a basis for the selected MCF value.

(c) \* \* \*  
(3) \* \* \*  
(ii) The year, the waste disposal quantity and production quantity for each year used in Equation TT-2 of this subpart to calculate the average waste disposal factor (WDF).

(d) For each year of landfilling starting with the “Start Year” (S) and each year thereafter up to the current reporting year, report the following information:

- (1) The calendar year for which the following data elements apply.
- (2) The quantity of waste (W<sub>x</sub>) disposed of in the landfill (metric tons, wet weight) for the specified year for each waste stream identified in paragraph (b) of this section.
- (3) The degradable organic carbon (DOC<sub>x</sub>) value (mass fraction) for the specified year and an indication as to whether this was the default value from Table TT-1 of this subpart or a value determined through sampling and calculation for each waste stream identified in paragraph (b) of this section.

(f) The modeled annual methane generation (G<sub>CH<sub>4</sub></sub>) for the reporting year (metric tons CH<sub>4</sub>) calculated using Equation TT-1 of this subpart.

(g) \* \* \*  
(1) The annual methane emissions (*i.e.*, the methane generation (MG), adjusted for oxidation, calculated using Equation TT-6 of this subpart), reported in metric tons CH<sub>4</sub>.

39. Section 98.467 is revised to read as follows:

**§ 98.467 Records that must be retained.**

In addition to the information required by § 98.3(g), you must retain

the calibration records for all monitoring equipment, including the method or manufacturer’s specification used for calibration, and all total and volatile solids concentration measurement data used for the purposes of paragraph § 98.460(c)(2)(xii) or used to determine landfill-specific DOC<sub>x</sub> values.

40. Section 98.468 is amended by adding the definitions for “Construction and demolition (C&D) waste landfill” and “Design capacity” to read as follows:

**§ 98.468 Definitions.**

*Construction and demolition (C&D) waste landfill* means a solid waste disposal facility subject to the requirements of subparts A or B of part 257 of this chapter that receives construction and demolition waste and does not receive hazardous waste (defined in § 261.3 of this chapter) or industrial solid waste (defined in § 258.2 of this chapter) or municipal solid waste (defined in § 98.6 of this part) other than residential lead-based paint waste. A C&D waste landfill typically receives any one or more of the following types of solid wastes: roadwork material, excavated material, demolition waste, construction/renovation waste, and site clearance waste.

*Design capacity* means the maximum amount of solid waste a landfill can accept, as indicated in terms of volume or mass in the most recent permit issued by the State, local, or Tribal agency responsible for regulating the landfill, plus any in-place waste not accounted for in the most recent permit. If the owner or operator chooses to convert the design capacity from volume to mass to determine its design capacity, the calculation must include a site specific density, which must be recalculated annually.

41. Table TT-1 of Subpart TT is amended by revising the entries for “Construction and Demolition” and “Inert Waste [*i.e.*, wastes listed in § 98.460(c)(2)]” to read as follows:

TABLE TT-1 OF SUBPART TT—DEFAULT DOC AND DECAY RATE VALUES FOR INDUSTRIAL WASTE LANDFILLS

Industry/waste type	DOC (weight frac- tion, wet basis)	K [dry climate <sup>a</sup> ] (yr <sup>-1</sup> )	k [moderate climate <sup>a</sup> ] (yr <sup>-1</sup> )	k [wet climate <sup>a</sup> ] (yr <sup>-1</sup> )
* * * * *	*	*	*	*
Construction and Demolition .....	0.08	0.02	0.03	0.04
Inert Waste [ <i>i.e.</i> , wastes listed in §98.460(c)(2)] .....	0	0	0	0
* * * * *	*	*	*	*

<sup>a</sup> The applicable climate classification is determined based on the annual rainfall plus the recirculated leachate application rate. Recirculated leachate application rate (in inches/year) is the total volume of leachate recirculated from company records or engineering estimates and applied to the landfill divided by the area of the portion of the landfill containing waste [with appropriate unit conversions].

(1) Dry climate = precipitation plus recirculated leachate less than 20 inches/year.

(2) Moderate climate = precipitation plus recirculated leachate from 20 to 40 inches/year (inclusive).

(3) Wet climate = precipitation plus recirculated leachate greater than 40 inches/year.

Alternatively, landfills that use leachate recirculation can elect to use the k value for wet climate rather than calculating the recirculated leachate rate.

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