United States
Environmental Protection
Agency

Mandatory Greenhouse Gas Reporting Rule: EPA's Response to Public Comments

Subpart L – Fluorinated Gas Production

Subpart L – Fluorinated Gas Production

U.S. Environmental Protection Agency
Office of Atmospheric Programs
Climate Change Division
Washington, D.C.

FOREWORD

This document provides responses to public comments on the U.S. Environmental Protection Agency's (EPA's) Proposed Mandatory Greenhouse Gas Reporting Rule: Additional Sources of Fluorinated GHGs: Subpart L, Fluorinated Gas Production. EPA published a Notice of Proposed Rulemaking in the Federal Register (FR) on April 12, 2010 (75 FR 18652). EPA received comments on this proposed rule via mail, e-mail, and at a public hearing held in Washington D.C. on April 20, 2010. Copies of all comments submitted are available at the EPA Docket Center Public Reading Room. Comments letters and transcripts of the public hearings are also available electronically through http://www.regulations.gov by searching Docket ID EPA-HQ-OAR-2009-0927.

EPA prepared this document in multiple sections, with each section focusing on a different broad category of comments on the rule. EPA's responses to comments are generally provided immediately following each comment. In some cases, EPA provided responses to specific comments or groups of similar comments in the preamble to the final rulemaking. Rather than repeating those responses in this document, EPA has referenced the preamble.

Comments were assigned to specific section of this document based on an assessment of the principal subject of the comment; however, some comments inevitably overlap multiple subject areas. For this reason, EPA encourages the public to read the other sections of this document relevant to their interests.

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Section 1 - Definition of Source Category

Section 1.1 - F GHG Production Processes

Commenter Name: Rob Rouse
Commenter Affiliation: The Dow Chemical Company
Comment Number: EPA-HQ-OAR-2009-0927-0119.1
Comment Excerpt Number: 8

Comment: Subpart L – Fluorinated Gas Production. EPA should clarify the definition of this source category. The definition of this source category is highly dependent on two definitions contained in existing §98.6 and proposed §98.128 respectively:

Fluorinated greenhouse gas means sulfur hexafluoride (SF_6), nitrogen trifluoride (NF_3), and any fluorocarbon except for controlled substances as defined at 40 CFR Part 82 Subpart A and substances with vapor pressures of less than 1 MM of Hg absolute at 25 degrees C. With these exceptions, ''fluorinated GHG'' includes but is not limited to any hydrofluorocarbon, any perfluorocarbon, any fully fluorinated linear, branched or cyclic alkane, ether, tertiary amine or aminoether, any perfluoropolyether, and any hydrofluoropolyether.

Fluorinated gas means any fluorinated GHG, CFC, or HCFC.

There is potential confusion or uncertainty in the definition of Fluorinated Greenhouse Gas, and by extension the definition of fluorinated gas. Although Dow agrees with the listing of compounds and families of compounds specified within the definition of Fluorinated Greenhouse Gas, Dow disagrees with the inclusion of the unnecessary, ambiguous phrase "…includes but is not limited to." The addition of this phrase reduces the clarity and specificity of the definition while introducing ambiguity for parties obligated to report. To correct this shortcoming, Dow suggests that EPA define "fluorinated GHG" as any fluorinated GHG that is listed in Table A-1 of the proposed rule. The suggested change would make the rules very clear and unambiguous.

Response: Under this rulemaking, EPA did not open the definition of fluorinated GHG for comment. We have determined that this definition provides sufficient clarity regarding the scope of the rule.[1] Please see the October 2009 preamble *Section III.OO* (74 FR 5620) for Subpart OO: Suppliers of Industrial GHGs, as well as the response to comments document on the same, for more discussion of the definition of fluorinated GHG. We are not aware of any reason why we should use a different definition of fluorinated GHG for this subpart than for the mandatory reporting rule as a whole.

The definition of "fluorinated gas" that was included in the April 2010 proposed rule differs from the definition of "fluorinated GHG" by including chlorofluorocarbons (CFCs) and

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[1] Note that the first sentence of the definition clearly establishes the full set of included compounds, while the second sentence provides examples. In the context of the second sentence, the phrase "includes but is not limited to" is not ambiguous, but highlights the fact that the types of compounds subsequently listed are examples that do not necessarily exhaust the set of compounds included by the first sentence.

hydrochlorofluorocarbons (HCFCs) in addition to fluorinated GHGs, but the commenter does not provide any comments regarding the inclusion of CFCs and HCFCs.

Commenter Name: Ross Smith
Commenter Affiliation: PCS Phosphate Company, Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0084.1
Comment Excerpt Number: 1

Comment: EPA should clarify exactly what compounds are subject to this Subpart L. The current definition of fluorinated GHG states, "Fluorinated greenhouse gas means sulfur hexafluoride (SF_6), nitrogen trifluoride (NF_3), and any fluorocarbon except for controlled substances as defined at 40 CFR part 82, subpart A and substances with vapor pressures of less than 1 m Hg absolute at 25 degrees C. With these exceptions, "Fluorinated GHG" includes, but is not limited to, any hydrofluorocarbon, any perfluorocarbon, any fully fluorinated linear, branched, or cyclic alkane, ether, tertiary amine or aminoether, any perfluoropolyether, and any hydrofluoropolyether."

There are many compounds that meet this definition, but do not appear in Table A-1 of the current rule. EPA should clearly state, in the context of Subpart L, the compounds that meet the definition of fluorinated GHG and which appear in Table A-1, providing clarification that this part of the determination is not exclusive of the other.

Response: The definition of "fluorinated GHG" rather than Table A-1 defines the set of fluorinated compounds that facilities must monitor and report, and EPA has determined that this definition provides sufficient clarity regarding the scope of the rule. For more discussion of this issue, please see the response to comment number EPA-HQ-OAR-2009-0927-0119.1, excerpt 8.

Commenter Name: Brian R. Keck
Commenter Affiliation: Air Products and Chemicals, Inc.
Comment Number: EPA-HQ-OAR-2009-0927-106.1
Comment Excerpt Number: 9

Comment: EPA should revise the perfluorocarbon (PFC) definition to indicate PFCs are compounds of carbon and fluorine and that all carbon bonds are fully saturated (only single bonds) where IPCC has identified a GWP. EPA should also revise the hydrofluorocarbon (HFC) definition to include only those liquid or gaseous (not including fluoropolymers) compounds containing between one and six hydrogen, fluorine, and carbon compounds identified by IPCC with a GWP.

Response: Under this rulemaking, EPA did not open the definition of perfluorocarbon (PFC) and hydrofluorocarbon (HFC) for comment.

Commenter Name: John Dege
Commenter Affiliation: DuPont
Comment Number: EPA-HQ-OAR-2009-0927-0103.1
Comment Excerpt Number: 8

Comment: Section 98.121 applicability references in error. EPA: Section 98.121 states: "You must report GHG emissions under this subpart if your facility contains a fluorinated gas production process that generates or emits fluorinated GHG and the facility meets the requirements of either section §98.2(a)(1) or (a)(2)." The preamble on page 18670 states; "Under this proposal, subpart L would require facilities that produce fluorinated gases to report their fluorinated GHG emissions from fluorinated gas production and transformation and from fluorinated GHG destruction." Comment: The rule limits applicability to industries specified in §98.2(a) (1) and a (2), whereas the preamble wording is broader. The preamble should clarify applicability only applies to the processes listed in §98.2(a) (1) and a (2).

Response: The final rule remains unchanged regarding applicability as specified in §98.121, which points to the list of source categories and the reporting thresholds in subpart A. As proposed (75 FR 18689), EPA is amending subpart A to add "fluorinated gas production" to the list of emission threshold source categories referenced in the appropriate subpart A table (specifically, Table A-4 to subpart A). See the preamble of the final rule for more discussion of this amendment. The source category itself is defined at §98.120. Note that the definition of the source category at §98.120, along with the reporting threshold at §98.121, determine which facilities must monitor and report their fluorinated GHG emissions from fluorinated gas production and other GHG-emitting processes. However, it does not define the full set of processes whose emissions must be reported under subpart L. Those processes include not only fluorinated gas production, but fluorinated gas transformation, fluorinated GHG destruction, and venting of residual fluorinated GHGs (see §98.122 and the specific calculation, monitoring, and reporting requirements of subpart L).

Commenter Name: Giedrius Ambrozaitis
Commenter Affiliation: Alliance of Automobile Manufacturers
Comment Number: EPA-HQ-OAR-2009-0927-0090.1
Comment Excerpt Number: 2

Comment: EPA should list reportable compounds and only require reporting for compounds greater than GWP 150. To further provide an incentive to switch to using low GWP compounds, EPA should establish a specific list of which compounds need to be reported and should set a reporting threshold to only include compounds with GWPs greater than 150. This list should exclude compounds which have a low GWP, i.e., compounds which are de minimis in nature. We recommend that 150 GWP be used as the threshold below which GHGs are considered de minimis and would not require reporting. In addition to minimizing tracking and reporting burdens, this would incentivize importers and exporters to switch more quickly out of high GWP GHGs.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0119.1, excerpt 8, as well as the 2009 Response to Comments Volume 2 – Selection of Reporting Thresholds, Greenhouse Gases, and De Minimis Provisions, response to comment EPA-HQ-OAR-2008-0508-0793.1, excerpts 1 and 2 (p. 7- 9). Note that even with a GWP of 150, if a compound is emitted in large quantities, it could still be a significant source of emissions.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 2

Comment: EPA appropriately limits Subpart L applicability to exclude reporting facilities subject to Subpart O, hydrochlorofluorocarbon ("HCFC")-22 Production and hydrofluorocarbon ("HFC")-23 Destruction. EPA should clarify the §98.120 (a) language to specifically reference Subpart O, instead of describing Subpart O without a direct reference. EPA should also explicitly exclude any activities being reported under Subparts OO or QQ of Part 98, the fluorochemical marketing reporting rules, as outside Subpart L applicability.

Response: We have concluded that it is clearest to define the fluorinated gas production source category by explicitly describing the activities that are included and excluded at §98.120. Section 98.120(a) excepts "processes that generate HFC-23 during the production of HCFC-22." (Note that this exception applies to processes rather than facilities; fluorinated GHG emissions from fluorinated gas production processes that are co-located with HCFC-22 production processes at the same facility must be reported under subpart L.) The requirement to report emissions of HFC-23 from production of HCFC-22 under subpart O rather than under subpart L is already clearly stated at §98.122(b) (as it was in the April 2010 proposed rule): "You must report under subpart O of this part (HCFC-22 Production and HFC-23 Destruction) the emissions of HFC-23 from HCFC-22 production processes and HFC-23 destruction processes. Do not report the generation and emissions of HFC-23 from HCFC-22 production under this subpart."

We are in some cases requiring reporting under subpart L of quantities that are also reported under subpart OO. The rationale for this reporting is discussed further in the preamble to the final rule and elsewhere in this response to comments document. (Please see, e.g., the responses to comment number EPA-HQ-OAR-2009-0927-0117.1, excerpt 10 in section 7 and comment number EPA-HQ-OAR-2009-0927-0103.1, excerpt 6b.)

Section 1.2 - CFC and HCFC Production Processes

Commenter Name: John Dege
Commenter Affiliation: DuPont
Comment Number: EPA-HQ-OAR-2009-0927-0103.1
Comment Excerpt Number: 3

Comment: HFC emission reporting from CFC production is not warranted. EPA: On page 18671 of the preamble, EPA requested comment on "the extent to which fluorinated GHGs are generated and emitted during CFC and HCFC production.” Comment: We do not detect any HFCs in our CFC production processes. Based on a detection limit of 0.1%, and an emission rate of 0.03% of total CFC production (based on 2009 emissions estimates from one of our CFC intermediate processes), then the maximum HFC emissions would be 0.00003% of CFC production, more than four orders of magnitude less than the EPA estimation of 1%. Hence, HFC emissions from CFC production would be reported as "zero" at the 0.1% detection limit, and HFC emissions reporting from CFC production is not warranted.

Response: In the final rule, EPA is retaining production of chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) in the definition of the fluorinated gas production source category. However, we are also clarifying that fluorinated GHGs that occur in process and emission streams only in trace concentrations are exempt from the monitoring requirements. In addition, we are clarifying that the scoping speciation requirement applies only to processes that have at least one process vent with uncontrolled emissions of 1.0 metric ton or more of fluorinated GHGs per year based on the preliminary estimate of emissions in §98.123(c)(1).

We believe that together, these clarifications and revisions will generally address the commenter’s concerns regarding reporting of extremely small concentrations and quantities of fluorinated GHGs in CFC and HCFC production processes. Given the considerable nationwide production of CFCs and HCFCs, as well as the recognized tendency of many CFC and HCFC production processes to generate fluorinated GHG by-products,[2] we have concluded that these clarifications are preferable to an across-the-board exclusion of CFC and HCFC production processes from subpart L. U.S. production of CFCs and HCFCs is considerable, on the order of 266,000 tons/yr (not including HCFC-22), and even if fluorinated GHGs are generated and emitted at relatively low rates from these processes, the total fluorinated GHG emissions may be significant. While the commenter notes that the emission percentage is small for the one CFC intermediate process noted, at other facilities and for other processes, the emissions percentage may be larger.

Commenter Name: John Dege
Commenter Affiliation: DuPont
Comment Number: EPA-HQ-OAR-2009-0927-0103.1
Comment Excerpt Number: 7

Comment: EPA should not require emission reporting for processes where FGHGs are neither reactants nor products. EPA: On page 18671 of the rule preamble, EPA is requesting comment to require reporting for emissions from processes where FGHGs are neither reactants nor products of the process but are by-products or intermediates. Comment: Determining applicability is already rather complicated for subpart OO and L. Changing applicability based on FGHG by-products and intermediates will further complicate understanding and application of the rules. Tracking and monitoring small concentrations across a process will also be difficult to do with accuracy. Additionally, for raw materials and products that are not FGHGs due to vapor pressure, by-products, intermediates and impurities are likely to be low vapor pressure

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[2] See the preamble of the proposed rule as well as the Technical Support Document for more discussion of these issues.

materials as well, with insignificant FGHG emissions. DuPont has several low volume low vapor pressure fluoromonomer products that are not FGHGs due their vapor pressure being less than 1 mm Hg. However, a 0.5% generated impurity in this product has a vapor pressure slightly over the 1 mm Hg threshold. Under EPA's contemplated expanded regulatory applicability scheme, the regulated impurity would subject the impurity, product, and raw material process streams to the costly FGHG monitoring, reporting and recording requirements. The annual production of one our higher volume fluoromonomer non-FGHG product is in the range of 1000 to 2000 metric tons (mtn)/yr. Since the FGHG component is small, and its vapor pressure low, its emissions are very small, estimated to be less than 0.01 mtn/yr. The atmospheric lifetime of this impurity is short, and hence its GWP is low, estimated to be less than 50. Including these kinds of products and processes in the regulatory scheme is not cost effective. Alternatively, if EPA adopted a definition of trace that included not only the 0.1 % definition, but also included either a reasonable mass based trace exemption (such as 5 tons/yr), or a CO_2e calculated exclusion of 10,000 mtn/yr, the rule could be practical. With mass or CO_2e alternatives in the trace exclusion, inclusion of by-products and intermediates would be less burdensome.

Response: In the final rule, EPA is not requiring reporting of fluorinated GHG emissions from processes where fluorinated gases are neither reactants nor products. We did not include such processes in the proposed rule and have concluded that it is not appropriate to include them in the final rule for the reasons cited by the commenter.

Commenter Name: Lorraine Krupa Gershman
Commenter Affiliation: American Chemistry Council
Comment Number: EPA-HQ-OAR-2009-0927-0092.1
Comment Excerpt Number: 5

Comment: ACC members do not detect fluorinated GHGs in the CFC and HCFC production processes at a detection limit of 0.1%, therefore, these emissions would be reported as either "zero" or "at detection limit." We do not believe that the burden imposed by monitoring and reporting of these emissions justifies the resulting reported data.

Response: Please refer to the response to comment number EPA-HQ-OAR-2009-0927-0103.1, excerpt 3.

Commenter Name: John Dege
Commenter Affiliation: DuPont
Comment Number: EPA-HQ-OAR-2009-0927-0103.1
Comment Excerpt Number: 4

Comment: Carbon tetrachloride and methyl chloroform emissions should not be regulated by Subpart L. EPA: On page 18671 of the preamble it also requests comment on: "the extent to which fluorinated GHGs may be generated and emitted during production of other ozone-depleting substances such as methyl chloroform and carbon tetrachloride and on whether such emissions should be reported under this rule." Comment: There are no fluorinated reactants present in the production processes for carbon tetrachloride and methyl chloroform. As such, there is no mechanism for HFC co-production nor emissions. Carbon tetrachloride and methyl chloroform process emissions should not be addressed in subpart L.

Response: EPA is not including production of chlorocarbons in the definition of the fluorinated gas production source category for the reasons cited by the commenter.

Commenter Name: Lorraine Krupa Gershman
Commenter Affiliation: American Chemistry Council
Comment Number: EPA-HQ-OAR-2009-0927-0092.1
Comment Excerpt Number: 4

Comment: EPA appropriately distinguished the production of a fluorinated GHG from production of chlorocarbons in §98.120. EPA correctly does not require subpart L reporting from carbon tetrachloride or methyl chloroform production processes, as there are no fluorinated reactants in either production process.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0103.1, excerpt 4.

Commenter Name: Rob Rouse
Commenter Affiliation: The Dow Chemical Company
Comment Number: EPA-HQ-OAR-2009-0927-0119.1
Comment Excerpt Number: 9

Comment: This Source Category should not include the production of non-fluorinated compounds. EPA specifically requested comments on the extent to which fluorinated GHG's may be generated during the production of other ozone-depleting substances, such as methyl chloroform and carbon tetrachloride. Dow operates multiple chlorinated organics plants in the US. There are no fluorinated reactants present in these production processes. As such, there is neither a mechanism for HFC of fluorinated GHG co-production nor emissions. Carbon Tetrachloride and Methyl chloroform process emissions should not be addressed in subpart L.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0103.1, excerpt 4.

Section 1.3 - Transformation Processes

Commenter Name: John Dege
Commenter Affiliation: DuPont
Comment Number: EPA-HQ-OAR-2009-0927-0103.1
Comment Excerpt Number: 9

Comment: Subpart L should not apply to non-emissive products. EPA: §98.122(c) states "You must report the total mass of each fluorinated GHG from (2) each fluorinated gas transformation process that is not part of a fluorinated gas production process …" Comment: EPA should exempt from reporting any fluorinated compounds that are not placed into subsequent emissive uses. This approach was taken in the ozone depleting substance program (40 CFR Part 82), where ozone depleting substances that are transformed in subsequent use to non-emissive compounds are exempt from the program.

Response: We are finalizing the proposed requirement that facilities report fluorinated GHG emissions from processes that transform fluorinated gases into other compounds, including compounds that are not themselves fluorinated GHGs. As discussed in the proposed rule, such transformation processes can emit fluorinated GHGs that are fed into the process as reactants or that are created as by-products. The focus of subpart L is on these and other emissions that occur at facilities that produce fluorinated gases. The 40 CFR part 82 regulations cited by the commenter are largely concerned with additions to and subtractions from the supply of ozone-depleting substances available for emissive use, but the part 82 regulations do include requirements for reporting the production of ozone-depleting substances even if they are transformed into substances that do not deplete the ozone layer.

Commenter Name: Lorraine Krupa Gershman
Commenter Affiliation: American Chemistry Council
Comment Number: EPA-HQ-OAR-2009-0927-0092.1
Comment Excerpt Number: 8

Comment: Further, some facilities may produce fluorinated gases that are used as intermediates in subsequent chemical synthesis by customers at their facilities, yielding a final product in which there are no emissions of the fluorinated compound of concern. EPA should exempt from reporting any fluorinated compounds that are not placed into subsequent emissive uses. This approach was taken in the ozone depleting substance program (40 CFR Part 82), where ozone depleting substances that are transformed in subsequent use to non-emissive compounds are exempt from the program.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0103.1, excerpt 9.

Commenter Name: John Dege
Commenter Affiliation: DuPont
Comment Number: EPA-HQ-OAR-2009-0927-0103.1
Comment Excerpt Number: 6a

Comment: It is DuPont's experience that most off-site transformations involve manufacturing less volatile fluoromonomer and fluoropolymer molecules and therefore are not significant contributors to F-GHG CO_2e emissions.

Response: EPA is not requiring reporting of fluorinated GHG emissions from transformation processes that are not co-located with fluorinated gas production processes.

Commenter Name: Dave Stirpe
Commenter Affiliation: Alliance for Responsible Atmospheric Policy
Comment Number: EPA-HQ-OAR-2009-0927-0117.1
Comment Excerpt Number: 11

Comment: The Alliance requests that EPA reevaluate the overlap between Subpart OO and Subpart L in regard to the Subpart OO requirement to report onsite transformation of fluorocarbon material that is also produced and used onsite. Such fluorocarbon material has never entered commerce or in many cases been isolated, rendering its reporting under Subpart OO unnecessary. Operations involving onsite fluorocarbon production followed by onsite transformation should be excluded from the reporting requirements of Subpart OO while the emissions from such activities should be reported solely under Subpart L.

Response: The final subpart L requires fluorinated gas production facilities to report emissions of fluorinated GHGs from processes that transform fluorinated gases. In a separate rulemaking, EPA has proposed to amend subpart OO to exempt from reporting (under that subpart) fluorinated GHGs that are produced and transformed at the same facility; please see the proposed rule at 75 FR 48744.

Commenter Name: Peter Zalzal
Commenter Affiliation: Environmental Defense Fund
Comment Number: EPA-HQ-OAR-2009-0927-0067
Comment Excerpt Number: 3

Comment: EDF also encourages EPA to include fluorinated gases that while neither reactants nor products are generated as byproducts, are intermediaries of another reaction.

Response: Please see the responses to comment number EPA-HQ-OAR-2009-0927-0103.1, excerpt 7, and comment number EPA-HQ-OAR-2009-0927-0103.1, excerpt 3.

Section 1.4 - Coverage of emissions downstream of production measurement (other than transformation and destruction)

Commenter Name: John Dege
Commenter Affiliation: DuPont
Comment Number: EPA-HQ-OAR-2009-0927-0103.1
Comment Excerpt Number: 6b

Comment: Other downstream emission points should not be included in Subpart L reporting. EPA: On page 18672 of the preamble, Sec 3 Definition of Source Category, last paragraph, EPA requests comment on the magnitude of other on-site emissions that occur at fluorinated GHG production facilities downstream of the production measurement and whether or not they should be required to be reported under subpart L. Comment: These other on-site emissions should not be required to be reported since the volume is already included in the measured production volume (double counting potential) and they represent a very small amount of the production volume. Having differing rule applicability for subparts OO and L will further complicate understanding and application of the rule.

Response: In the proposed rule, EPA requested comment on requiring reporting under subpart L of emissions that occur at fluorinated GHG production facilities after the production measurement (other than emissions from fluorinated GHG transformation and destruction processes). We specifically requested comment on the desirability of including emissions from cylinder filling, blending of fluorinated GHGs, recycling or reclamation of fluorinated GHGs, and evacuation of fluorinated GHG heels from returned cylinders. We noted that these emissions are reported as supply under subpart OO, but that some reporting under L of emissions that are counted as supply under OO is appropriate to inform the range of possible policies to reduce emissions of GHGs. This range includes “upstream” approaches focused on supply and “downstream” approaches focused on actual emissions where they occur.

In the final rule, we are not requiring reporting of emissions from cylinder filling (e.g., disconnect losses), from blending of fluorinated GHGs, from equipment leaks beyond the production measurement, or from recycling or reclamation because these emissions appear to be small based on our research and public comments. However, as discussed in the preamble of the final rule, we are requiring reporting of emissions from venting of residual fluorinated GHGs in returned containers because our research has shown that these emissions can be significant at some facilities. (See the Technical Support Document for more discussion of this issue.)

To avoid double-counting, we are requiring facilities to report emissions that are counted as supply under subpart OO separately from emissions that are not counted as supply under OO. Thus, facilities are required to separately report fluorinated GHG emissions from transformation of fluorinated GHGs that are produced off-site, from destruction of fluorinated GHGs that are sent to the facility for destruction (e.g., from the field or from other facilities), and from venting of residual fluorinated GHGs in returned containers. These requirements are straightforward and we do not expect them to cause confusion.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0085.1
Comment Excerpt Number: 6

Comment: At 75 Fed. Reg. 18672/2, EPA requests comment concerning the magnitude of onsite emissions events that may be best described in Subpart OO activities. The most common situation is the trivial portion of disconnect losses from packaging FGHGs at or beyond the custody transfer point. Arkema’s experience with ozone depleting substance (“ODS”) disconnect losses has shown that ODS disconnect losses amount to less than 0.01% of total ODS production. Subpart OO assumes that all materials passing the custody transfer point will either be emitted, transformed, or recycled. Any Part 98 reporting of these post-transfer point emissions is best managed in Subpart OO. Emissions before the transfer point should be reported in Subpart L. Fugitive emissions past the custody transfer point are the second part of post-transfer point secondary emissions. Well over 99% of the fugitive equipment component count in FGHG service in the Arkema FGHG production units are before the custody transfer point. Total equipment leak losses past the custody transfer point are expected to be insignificant, partially due to the very limited number of components, the need to maintain the product handling and distribution systems under adequate pressure to maintain inventory, and to maintain adequate product quality specifications. Because any post-custody transfer point emissions, as a trivial source of FGHG emissions, are allocated in Subpart OO, Subpart L reporting is not necessary.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0103.1, excerpt 6b.

Commenter Name: Lorraine Krupa Gershman
Commenter Affiliation: American Chemistry Council
Comment Number: EPA-HQ-OAR-2009-0927-0092.1
Comment Excerpt Number: 7

Comment: In addition, on page 18672 of the preamble, the last paragraph in the Definition of Source Category discussion requests comment on the magnitude of other on-site emissions that occur at fluorinated GHG production facilities downstream of the production measurement and whether or not they should be required to be reported under subpart L. These other on-site emissions should not be required to be reported since the volume is already included in the measured production volume (double counting potential), and they represent a very small amount of the production volume.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0103.1, excerpt 6b.

Commenter Name: Brian R. Keck
Commenter Affiliation: Air Products and Chemicals, Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0106.1
Comment Excerpt Number: 8

Comment: In B. Fluorinated Gas Production, Section 3, page 18672 of the preamble, Definition of Source Category, the last paragraph requests comment on the magnitude of other on-site emissions that occur at fluorinated GHG production facilities downstream of the production measurement and whether or not they should be required to be reported under subpart L. These other on-site emissions should not be required to be reported since the volume is already included in the measured production volume (double counting potential), and they represent a very small amount of the production volume.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0103.1, excerpt 6b.

Section 1.5 - Other

Commenter Name: Lorraine Krupa Gershman
Commenter Affiliation: American Chemistry Council
Comment Number: EPA-HQ-OAR-2009-0927-0092.1
Comment Excerpt Number: 6

Comment: We agree with EPA's understanding and do not expect significant emissions from wastewater and storage tanks for the reasons discussed in the preamble. Most fluorinated GHGs have low solubility in water, and the majority of fluorinated GHG processes do not typically generate wastewater streams. Those processes that do generate wastewater streams would therefore not transfer fluorinated GHGs into the aqueous phase inside the process during a washing step. Storage tanks are pressurized units and would not generate the typical working and breathing emissions associated with this type of equipment. Our experience with container filling is also consistent with the discussion in the preamble. Container filling takes place after the fluorinated GHG production facilities measure their production, so the volume would have already been included and reported in the Subpart OO production measurement.

Response: EPA appreciates the input on its request for comment on other types of emission points at fluorinated gas production facilities and the magnitude of emissions from these emission points. The promulgated rule for subpart L does not include requirements for reporting of emissions from wastewater streams, storage tanks, or container filling for the reasons cited in the April 2010 proposed rule and by commenters.

Commenter Name: John Dege
Commenter Affiliation: DuPont
Comment Number: EPA-HQ-OAR-2009-0927-0103.1
Comment Excerpt Number: 5

Comment: Storage tank and wastewater emissions should not be included in Subpart L reporting. EPA: On page 18680 of the preamble, EPA requested comment on emissions from storage tanks and wastewater. Comment: We agree with EPA's understanding and do not expect significant emissions from wastewater and storage tanks for the reasons mentioned in the Preamble. The majority of FGHG processes do not generate wastewater streams, and for those that do, most fluorinated GHGs have low solubility in water, and would therefore not transfer into the aqueous phase inside the process during a washing step. Storage tanks are pressurized units and would not generate the typical working and breathing emissions associated with this type of equipment. Our experience with container filling is also consistent with the Preamble. Container filling typically takes place after the fluorinated GHG production facilities measure their production, so the volume would have already been included and reported in the Subpart OO production measurement.

Response: Please see response to comment number EPA-HQ-OAR-2009-0927-0092.1, excerpt 6.

Commenter Name: Brian R. Keck
Commenter Affiliation: Air Products and Chemicals, Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0106.1
Comment Excerpt Number: 15

Comment: In B. Fluorinated Gas Production, Section 5.d., EPA requests comment on the inclusion of fluorinated GHG emissions from storage tanks, wastewater, and container filling, anticipating that these emissions would be small to insignificant due to low solubility of most fluorinated GHGs in water and the use of pressurized vessels for storage. Air Products concurs with the position that the emissions would be very small to insignificant for the reasons stated and do not anticipate significant emissions from wastewater and storage tanks for the reasons discussed in the preamble. Most fluorinated GHGs have low solubility in water, and the majority of fluorinated GHG processes do not even generate wastewater streams. Those processes that do generate wastewater streams would therefore not transfer fluorinated GHGs into the aqueous phase inside the process during a washing step. Storage tanks are pressurized units and would not generate the typical working and breathing emissions associated with this type of equipment.

Response: Please see response to comment number EPA-HQ-OAR-2009-0927-0092.1, excerpt 6.

Section 2 - Reporting Threshold

Commenter Name: Ross Smith
Commenter Affiliation: PCS Phosphate Company, Inc
Comment Number: EPA-HQ-OAR-2009-0927-0084.1
Comment Excerpt Number: 2

Comment: The applicability for this Subpart is based on uncontrolled emissions threshold of 25,000 metric tons (mt) carbon dioxide equivalent (CO_2e) threshold. Many of the fluorinated GHGs identified in Table A-1 have such high Global Warming Potential (GWP), that they would only be able to emit slightly more than 1 mt of the compound and exceed the threshold. The threshold would be better suited as a mt of each compound (i.e., 10 mt fluorinated GHG) rather than on a CO_2e basis. This will enable EPA to make a threshold which will capture the large emitters, but will not affect smaller facilities, even if they emit more potent greenhouse gases. Additionally, the threshold should be on a post-control basis, in which comparison of actual emissions to the threshold is used to determine applicability, consistent with the approach for the other Subparts of this Part. The use of actual emissions for determining threshold exceedance would also be consistent with EPA’s proposal to use actual emissions for determining whether a facility could discontinue reporting. The approach for determining applicability, or the ability to discontinue reporting, should be on a consistent basis, either all pre-control or all post- control.

Response: In the final rule, we are adopting the proposed threshold of 25,000 metric tons of CO_2e, uncontrolled. The use of metric tons of carbon-dioxide equivalent (CO_2e) rather than metric tons of fluorinated GHG in the threshold is consistent with the definition of emission thresholds throughout the Mandatory GHG Reporting Rule. Carbon-dioxide equivalents (and the global warming potentials developed to calculate them) have been developed as a means of comparing GHGs based on their ability to trap heat in the atmosphere over a specific time horizon, and they are widely used in international reporting of GHG emissions and sinks and in GHG policy analyses. A facility that emits *one* ton of SF_6 (with a 100-year GWP of 23,900) has an impact on climate forcing over the next 100 years that is almost four times as large as that of a facility that emits *five* tons of HFC-134a (with a 100-year GWP of 1300). Thus, defining a threshold in terms of tons of fluorinated GHG could result in requiring reporting from facilities that contribute comparatively little to climate forcing, while exempting from reporting facilities that contribute much more. The result would be a reporting program that captured a smaller share of CO_2-equivalent emissions and/or disproportionately burdened facilities with relatively small CO_2e emissions. Hence, to ensure that this rule efficiently and effectively collects the information necessary to fully inform GHG policies and programs, the reporting threshold is defined in terms of CO_2e rather than tons of fluorinated GHG.

EPA is finalizing the uncontrolled emissions threshold for this source category because facilities may overestimate their destruction, and consequently underestimate their emissions, of fluorinated GHGs. As discussed in the preamble of the final rule, some fluorinated GHGs, particularly CF_4 and SF_6, are very difficult to destroy. In fact, they are more difficult to destroy than the compounds that are typically used to establish destruction efficiencies (DEs) for hazardous waste combustors (i.e., the Class 1 compounds in the thermal stability rankings in Appendix D to EPA's "Guidance on Setting Permit Conditions and Reporting Trial Burn Results.") Facilities may underestimate emissions of such compounds because they are inappropriately applying a DE established for a compound that is actually easier to destroy, or because, as noted in the April 2010 proposed rule, they are not aware of the full range of by-products generated by their processes in the first place. The DE testing and scoping speciation provisions of the rule are intended to address these possibilities. Once a facility has (1) definitively identified the compounds that are generated and emitted by its processes and (2) established the DE of its destruction device for the compounds that are vented to the device, the facility's conclusions about its own controlled emissions will be more reliable. (This reliability will be further enhanced by the rule's inclusion of provisions to address emissions that occur during destruction device malfunctions.) For these reasons, it is not inconsistent to use uncontrolled emissions for the initial threshold determination and controlled emissions for determining eligibility for the "off-ramp" provisions at §98.2(i).

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0084.1-0085.1
Comment Excerpt Number: 7

Comment: At 75 Fed. Reg. 18673/2, EPA requests comment on the Subpart L applicability threshold basis. EPA proposed to base the Subpart L reporting threshold on precontrol FGHG emissions. Any reporting off ramp should be based on the same precontrol emissions basis. For fluorinated product lines emitting FGHGs with no Part 98 Table A-1 global warming potential ("GWP") values, EPA should adopt a similar approach to the reporting of such compounds used in the Subpart OO in effect when Subpart L reporting begins. A mass-based approach, where only facilities emitting a relatively small amount of FGHGs without GWP values (for example, <1 ton per year) escape reporting, meets EPA's comprehensive reporting goals. EPA should maximize Subpart L reporting to as much of the fluorochemical industry as possible.

Response: Please see response to comment number EPA-HQ-OAR-2009-0927-0084.1, excerpt 2.

Commenter Name: Craig Holt Segall
Commenter Affiliation: Sierra Club
Comment Number: EPA-HQ-OAR-2009-0927-0128.1
Comment Excerpt Number: 11

Comment: We support EPA's decision to set a reporting threshold of no more than 25,000 $mtCO_2e$, which could embrace as much as 100% of all emissions. Indeed, because essentially all of the 14 production facilities would be covered at any threshold, we suggest EPA consider using a simple "all-in" approach for this category, which would eliminate the technical complexities facilities would otherwise face in determining compliance with the threshold.

Response: EPA appreciates your comment. In order to allow for the exclusion of facilities that emit very little fluorinated GHG on a CO_2e basis, EPA is not adopting an all-in approach. This is because some subsections of the industry, e.g., HFE manufacturers, are generally comprised of small production facilities. Although HFE manufacturers may generate by-products with high GWPs, their emission rates are much smaller than that of other production facilities. Thus, EPA is not adopting the all-in approach in order to reduce the burden on small facilities.

Commenter Name: Brian R. Keck
Commenter Affiliation: Air Products and Chemicals, Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0106.1
Comment Excerpt Number: 10

Comment: In B. Fluorinated Gas Production, Section 4, EPA requests comments on the option of eliminating the threshold for fluorinated gas production facilities and making this an "all-in" category. Air Products supports this option.

Response: Please see response to comment number EPA-HQ-OAR-2009-0927-0128.1, excerpt 11.

Section 3 – No comments

Section 4 - Detailed GHG Emission Calculation Procedures/Equations in the Rule

Commenter Name: Peter Zalzal
Commenter Affiliation: Environmental Defense Fund
Document Control Number: EPA-HQ-OAR-2009-0927-0067
Comment Excerpt Number: 7

Comment: Lastly, EDF shares the Agency's interest in accurate, reliable data and we recognize that system-wide accuracy can often be achieved through a combination of monitoring methods. We know that EPA has generally expanded the monitoring methods available to fluorinated gas facilities including proposing a refined method for estimating emissions factors from semiconductor facilities in lieu of the 2006 IPCC Tier 3 method and allowing producers of fluorinated greenhouse gases increased flexibility in using mass balance measurements to monitor their emissions. EDF encourages the Agency to ensure that these revised methods do indeed provide accurate data and we look forward to providing more detailed analyses of the proposal in our written comments.

Response: EPA appreciates the commenter's support in its efforts to provide flexible, accurate monitoring methods to facilities in the fluorinated gas production source category.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Commenter Excerpt Number: 8

Comment: EPA appropriately proposes, at proposed 40 CFR 98.123, to allow reporting facilities two options to report actual FGHG emissions from fluorochemical production facilities. The amended mass balance approach, using a relative error accuracy approach instead of the absolute error approach in the 2009 proposal, is a substantial improvement from the 2009 proposed Subpart L mass balance system. EPA appropriately recognizes that a mass balance could be subject to substantial error. We support the error bounds at proposed §98.123(a) where reporters who cannot demonstrate acceptable error in a mass balance across a process must utilize the proposed 40 CFR §98.123(b) emission factor estimation method. Arkema appreciates EPA's serious consideration of our June 2009 comments suggesting a Subpart L emission factor based reporting system. EPA appropriately incorporated several maximum achievable control technology ("MACT") concepts from various 40 CFR 63 subparts into this Subpart L proposal. EPA appropriately recognized that many of the FGHG manufacturing processes that will report under Subpart L are already regulated under one or more MACT standards. The recommendations below will strengthen the ultimate Subpart L.

Response: EPA appreciates the commenter's support in its efforts to provide flexible, accurate monitoring methods to facilities in the fluorinated gas production source category.

Section 4.1 - GWPs not Available for all F GHG Compounds

Commenter Name: Dave Stirpe
Commenter Affiliation: Alliance for Responsible Atmospheric Policy
Comment Number: EPA-HQ-OAR-2009-0927-0117.1
Comment Excerpt Number: 2

Comment: The Alliance believes that the definition of "fluorinated gas" is too vague. It leaves much uncertainty as to what is included. In order to provide clear direction· as to the fluorinated gases that are required to be reported, we request that EPA provide a positive specific list of the compounds upon which reporting is required. The list should include both the specific compound and its GWP. GWPs that are not in the Fourth Assessment Report should be taken from a recent credible scientific assessment report. Without a specific list, it appears that there will be inconsistency in the reports since the definition will be interpreted differently among those required to report. Furthermore, many of the proposed requirements for in-process flow reporting include chemicals for which GWPs have not been determined. Business and industry need certainty, and absent a list of covered compounds and the EPA's accepted GWP, industry cannot determine with certainty whether it is in compliance with its reporting requirements. The publication of a specific list is consistent with existing regulations dealing with the reporting and handling of hazardous materials, including existing DOT regulations, existing EPA regulations for Tier I/Tier II reporting and for TRI Reporting. In any case when the chemical is not isolated, EPA should provide guidance on how such a chemical should be reported.

Response: EPA has designed the requirements of the final rule to ensure consistency among fluorinated gas production facilities in how they monitor and report emissions of fluorinated GHGs that do not have GWPs listed in Table A-1 to subpart A. The definition of “fluorinated GHG” rather than Table A-1 defines the set of fluorinated compounds that facilities must monitor and report, and EPA has determined that this definition provides sufficient clarity regarding the scope of the rule. Because facilities are not required to report CO_2-equivalent emissions of fluorinated GHGs that do not have GWPs listed in Table A-1, differences in facilities’ evaluations of these gases’ GWPs will not affect the CO_2-equivalent totals that they report. Where the rule requires a preliminary assessment of emissions in CO_2-equivalent terms, facilities are required to use a default GWP of 2,000 for GHGs for which GWPs are not listed in Table A-1, except in cases where the GWP of 2,000 would significantly overestimate the CO_2e emissions from a continuous process vent and inappropriately trigger emission testing. In these cases, facilities may submit a request to EPA to use a provisional GWP for emitted compounds that do not have GWPs listed in Table A-1. As part of the process of reviewing the request, EPA will publish the proposed provisional GWPs and the information supporting them, providing an opportunity for public comment and ensuring that provisional GWPs are based on sound data and analysis and are consistently applied across facilities.

These issues are discussed in more detail in section II.E.3 of the preamble to this rule (see section II.E, Fluorinated Gas Production (Subpart L)).

Commenter Name: Jeff C. Muffat
Commenter Affiliation: 3M Center
Comment Number: EPA-HQ-OAR-2009-0927-0111.1
Comment Excerpt Number: 6

Comment: §98.120 Definition of the source category. Not all compounds used in fluorinated-GHG production are listed in Table A-1 and few if any of 3M's vent streams will contain only Table A-1 compounds. While the rule provides a mass-based threshold in these cases, significant measurement and reporting obligations will be required for sources that emit low GWP materials. An example from one of 3M's manufacturing facilities is provided in Attachment 1. Another issue concerns the RSD requirements that are listed in the rule. Meeting these requirements for each chemical will be problematic. We recommend that GHG's for non-Table A-1 compounds be determined using the methods described and referenced in Section 2.10 of the Intergovernmental Panel on Climate Change Fourth Assessment report (IPCC AR4). Allowing such calculations would be mutually beneficial to all stakeholders. The process would generate important information that could be used by the agency in evaluating the inventory data. The agency will need to complete this work as part of its evaluation of inventory data, and it will very likely use similar methods. 3M and other companies in this source category have already completed much of this work. Emission estimates would still be required and reported for these locations along with any GWP calculations. The specific reference for the GWP calculations in section 2.10 of IPCC AR4 is the methodology of Pinnock et al.[1] Furthermore, an Excel implementation is also available.[2] For short-lived GHGs, i.e., lifetimes less than one week, the methods listed in the IPCC will overestimate the GWP as these compounds are not well mixed in the atmosphere. In this case, modeling the transport of the fluorochemicals using a suitable chemical transport model provides a more accurate GWP value. This method is described by Acerboni et al.[3] who observed that the radiative forcing was 8 to 23 times lower for short-lived perfluorinated alkenes using the chemical transport model versus the well-mixed assumptions that is referenced in Pinnock. This reference also contains GWP values that are not currently contained in Table A- 1.

Response: Please see section II.E.3 of the preamble to this rule and the response to comment EPA-HQ-OAR-2009-0927-0117.1, excerpt 2.

Commenter Name: John Dege
Commenter Affiliation: DuPont
Comment Number: EPA-HQ-OAR-2009-0927-0103.1
Comment Excerpt Number: 16

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[1] Pinnock, S.; Hurley, M. D.; Shine, K. P.; Wallington, T. J.; Smyth, T. J., Radiative forcing of climate by hydrochlorofluorocarbons and hydrofluorocarbons. Journal of Geophysical Research 1995, 100, (D11), pp. 23227-23238).

[2] Elrod, M. J., Greenhouse Warming Potentials from the Infrared Spectroscopy of Atmospheric Gases. (Journal of Chemical Education 1999, 76, (12), pp. 1702-1705.

[3] Acerboni, G., Beukes, J.A., Jensen, N.R., Hjorth, J., Myhre, G., Nielsen, C.J., Sundet, J.K., Atmospheric degradation and global warming potentials of three perfluoralkenes," Atmospheric Environment (2001) 35: 4113-4123.

Comment: Subpart L needs to allow calculation of GWP for FGHG chemicals not listed on Table A-1. EPA: §98.123(a). For a number of processes, the emissions of FGHG products, by-products, and waste compounds do not have a GWP factor and therefore the facility cannot calculate the absolute error in units of CO_2e. Comment: EPA needs to provide an option to calculate a compound's GWP including those consistent with internationally recognized protocols. This option should also be allowable to determine facility applicability in section 98.121, and for determining the appropriate emission factor methodology in section 98.123(b)(2)(A). By conservatively assuming fluorinated compounds without an established GWP have a GWP on the order of 10,000 makes the applicability of this regulation significantly more probable on fluorinated compounds that have been previously qualitatively determined (based the compound's volatility, use, atmospheric lifetime, volume etc) to not be a global warming compound of concern. These substances would include those that are used exclusively as reactive intermediates in the production of other chemicals of commerce. Generally, such substances are consumed entirely in the production process, are not released to the atmosphere and do not contribute to climate change. Other substances are produced in significant volume but because of their low vapor pressure, short atmospheric lifetimes (less than 1 year) and modest GWP (less than 50) produce an insignificant contribution to greenhouse forcing when compared to existing high production volume fluorinated gases. It is not only unreasonable, but is also inappropriate to shift the primary impact of the regulation by assigning a 10,000 GWP to all fluorinated organics with a vapor pressure greater than 1 mm Hg that do not have a Table I-A GWP. Allowing GWP calculation methodologies including internationally accepted GWP calculation methodologies will better focus the chemical industry's limited financial resources to assess CO_2e emissions of any significance. A recommended scientific methodology is provided in Appendix A.

Response: Please see section II.E.3 of the preamble to this rule and the response to comment EPA-HQ-OAR-2009-0927-0117.1, excerpt 2.

Commenter Name: Lorraine Krupa Gershman
Commenter Affiliation: American Chemistry Council
Comment Number: EPA-HQ-OAR-2009-0927-0092.1
Comment Excerpt Number: 20

Comment: We believe it is important for EPA to allow facilities to calculate a compound's Global Warming Potential (GWP) consistent with internationally recognized protocols when it is not included on Table A-1 of the rule. This would help a facility determine rule applicability in §98.121, and determine the appropriate emission factor methodology in §98.123(b)(2)(A). As detailed on page 18674 of the preamble, EPA notes that it is "making the reasonably conservative assumption that the unknown fluorinated GHG could have a GWP of 10,000." This assumption by EPA makes this regulation more onerous on fluorinated compounds that previously have not been considered in this rulemaking. These substances would include those that are produced in substantial volume but are used exclusively as reactive intermediates in the production of other chemicals of commerce. Generally, such substances are consumed entirely in the production process, are not released to the atmosphere and do not contribute to climate change. Other substances are produced in significant volume, but due to their low vapor pressure, short atmospheric lifetimes (less than 1 year) and modest GWP (less than 50), produce an insignificant contribution to GHG emissions when compared to existing high production volume fluorinated gasses. By arbitrarily and unreasonably assigning a 10,000 GWP to all fluorinated organics with a vapor pressure greater than 1 mm Hg, EPA is placing an enormous burden on fluorinated GHG compounds that are not the central focus of the rule. Allowing facilities to utilize GWP calculation methodologies, including internationally accepted GWP calculation methodologies, will better focus the chemical industry's resources to assess CO_2e emissions of significance. A recommended scientific methodology following IPCC guidelines is provided in Appendix A.

Response: Please see section II.E.3 of the preamble to this rule and the response to comment EPA-HQ-OAR-2009-0927-0117.1, excerpt 2 for a response to this comment.

Commenter Name: Joel R. Hall
Commenter Affiliation: Mexichem Fluor Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0104
Comment Excerpt Number: 10

Comment: The agency needs to provide a means to calculate a compound's Global Warming Potential (GWP) for compounds not listed in Table A-1. Table A-1 to Subpart A of Part 98 lists Global Warming Potentials for a number of chemical compounds. However, the table is not exhaustive and compounds not listed could be considered by-products and therefore subject to reporting. Lack of a specified means to calculate an unlisted compound's GWP will lead to inconsistencies among regulated entities.

Response: Please see section II.E.3 of the preamble to this rule and the response to comment EPA-HQ-OAR-2009-0927-0117.1, excerpt 2.

Section 4.2 - Mass Balance Calculations

Commenter Name: Craig Holt Segall
Commenter Affiliation: Sierra Club
Comment Number: EPA-HQ-OAR-2009-0927-0128.1
Comment Excerpt Number: 15

Comment: Second, EPA does not convincingly explain why it uses a monthly frequency for mass-balance reporting. EPA suggests that daily measurements may be highly variable,[4] but these variations would be smoothed by averaging daily values, and so do not provide much support for reducing monitoring frequencies. To the contrary, as EPA itself explains, "[w]here mass flows and concentrations are variable, more frequent measurements and calculations will

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[4] See, e.g., 75 Fed. Reg. at 18,675.

lead to more accurate and precise estimates than less frequent measurements and calculations."[5] EPA's only salient objection on this point is that less frequent sampling may help improve worker safety by reducing the need to test some corrosive or hazardous emissions streams. EPA is right to take this concern seriously, but it needs to document it more carefully, showing where these streams are, and whether or not technical changes may allow them to be measured safely. If measurements can be taken on some or most streams more frequently without creating additional worker safety risks, they should be. EPA should, at a minimum, strongly consider weekly reporting for all streams, unless worker safety concerns makes such reporting inappropriate for some specific emissions source. Fine-grained data is critical, especially where, as here, an emissions source is both highly variable and has high GWP gases, such that emissions on a single day may be quite significant.

Response: In response to this comment, and also in response to comments that raised questions regarding the treatment of multiple measurements in the error calculation in the mass-balance approach, EPA has clarified in the final rule that process variability and measurement frequency must be considered in the error calculation. Specifically, variability in stream concentrations and the frequency of concentration measurements must be considered.

As discussed in the Technical Support Document in the context of emission testing, the more variable a parameter is, the more samples must be taken to precisely characterize the mean of that parameter. The number of samples required to estimate the mean of the parameter with a given level of confidence can be calculated based on the relative standard deviation (RSD) of the samples and on some assumptions about the distribution of the parameter. Where the set of samples is relatively small and only the sample standard deviation "s" is known (rather than the true standard deviation of the parameter), the appropriate statistic is often the Student's t test.

Monthly sampling will generate twelve concentration measurements per stream per year. If the variability among the concentration measurements is high enough that these 12 measurements per year (i.e., monthly measurements) result in relative and absolute errors above the 30-percent and 3,000-mtCO_2e limits, based on the Student's t test, then the facility must increase the frequency of its measurements if it wishes to use the mass balance approach for the process. For example, facilities may find that weekly measurements are necessary to meet the error criteria for certain processes. By including process variability in the error calculation, the rule ensures that more frequent measurements will be made if this is necessary to address process variability, but it limits the costs and risks of sampling for processes where less frequent measurements yield precise results.

In addition to clarifying that process variability must be considered in the error calculation of the mass balance approach, EPA is also requiring that facilities that use the alternative to the error calculation (the precision and accuracy requirements at §98.124(b)(8)) make weekly measurements and calculations. EPA calculates that at a weekly frequency, these measurements will lead to reasonably accurate emission estimates (with an error near 30 percent) even if the concentrations in the process are highly variable (e.g., even if the RSD of the concentration measurements is 50 percent, which would be unusually high.)

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[5] Id.

Two other requirements in the rule also address process variability. First, under the mass balance approach, facilities are required to make concentrations measurements that reflect the full range of conditions within the process, e.g., catalyst age. Facilities are also required to account for emissions that occur during process startups, shutdowns, and malfunctions, either recording fluorinated GHG emissions during these events or documenting that these events do not result in significant emissions. Together, these requirements limit the impact of sampling bias on emissions estimates. Please see section II.E.3 of the preamble to this rule for more discussion of the issue of process variability.

Commenter Name: Dave Stirpe
Commenter Affiliation: Alliance for Responsible Atmospheric Policy
Comment Number: EPA-HQ-OAR-2009-0927- 0117.1
Comment Excerpt Number: 8

Comment: A substantial concern during the 2009 proposal process was the original mass balance approach. The current proposal removed many of the complexities of the 2009 draft Subpart L, including unachievable material measurement, accuracy, and calibration standards. EPA appropriately proposed monthly mass balance calculations, instead of daily mass balance determinations in 2009.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0128.1, excerpt 15.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 46

Comment: Monthly mass balance monitoring, as proposed at §98.124(b), is appropriate. Monthly mass balance data smoothes out daily mass balance variances that obscure actual operating trends.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0128.1, excerpt 15.

Commenter Name: John Dege
Commenter Affiliation: DuPont
Comment Number: EPA-HQ-OAR-2009-0927-0103.1
Comment Excerpt Number: 11

Comment: Section 98.124(b) states “If you determine fluorinated GHG emissions using the mass balance method under §98.123(a), you must estimate the total mass of each fluorinated

GHG emitted from the process at least monthly." DuPont supports a monthly calculation, as compared to the April 2009 proposal of weekly calculations.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0128.1, excerpt 15.

Commenter Name: Ross Smith
Commenter Affiliation: PCS Phosphate Company, Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0084.1
Comment Excerpt Number: 4

Comment: Under the current proposal, EPA is considering allowing a mass balance approach for processes which meet an error estimation quantity limitation. The error estimation is made up of a complex set of requirements. A significant amount of effort would have to be dedicated to determining if a facility could utilize the mass balance approach. Should the analysis yield that the facility cannot use this approach, these efforts would be wasted and the facility would be required to develop process specific emissions factors. Rather than forcing facilities to determine whether or not they can meet the requirement, the rule should be revised so that facilities which emit emissions less than a set threshold could utilize the mass balance approach, while those above the threshold must comply using the other proposed method. Additionally, the development of process specific emissions factors, or the use of engineering estimates, could be less accurate than the error threshold of 30 percent or 3,000 mt CO_2e required for the mass balance approach.

Response: In response to this and other comments regarding the complexity of the mass-balance error calculation, EPA is including in the final rule an alternative set of requirements that are designed to ensure that emission estimates developed using the mass-balance approach are reasonably accurate and precise. Under this alternative set of requirements, which can only be used for processes that have a total annual throughput of 500,000 $mtCO_2e$ or less of fluorinated GHG reactants, products, and by-products, facilities are required to measure the masses identified in the rule with an accuracy and precision of ±0.2 percent of full scale or better, to measure the concentrations identified in the rule using analytical methods with an accuracy and precision of ±10 percent or better, and to conduct these measurements at least weekly.

These requirements have been developed in consideration of the five factors that affect the absolute accuracy and precision of mass-balance estimates: (1) the relative accuracy and precision of the mass measurements, (2) the relative accuracy and precision of the methods used to measure concentrations (irrespective of process variability), (3) process variability, (4) the frequency of the measurements, and (5) the quantity of the fluorinated GHG throughput of the process, that is, the total masses of the fluorinated GHG reactants, products, and by-products fed into and generated by the process. After considering multiple scenarios, EPA has concluded that the required accuracies, precisions, and frequencies for the mass and concentration measurements, in combination with the 500,000 $mtCO_2e$ throughput limit, represent a reasonable means of achieving absolute errors near or below 3,000 $mtCO_2e$.[6] The 3,000 $mtCO_2e$ absolute error was identified as the limit because it is consistent with the absolute error limit in the error calculation approach, which is discussed further below.

Although some of the requirements could be relaxed and still result in an error near or below 3,000 $mtCO_2e$, this would require a tightening of the other requirements. For example, if the requirements for the precision and accuracy of the mass measurements were relaxed to ±0.4 percent, the requirements for the precision and accuracy of the concentration measurements would have to be tightened, e.g., to ±5 percent, and the frequency of these measurements would have to be increased. Based on comments received on the April 10, 2009 and April 12, 2010 proposed rules, EPA understands that achieving precisions and accuracies of ±5 percent for concentration measurements, and conducting these measurements more often than weekly, could be quite challenging. On the other hand, EPA believes that a number of facilities and processes are likely to be able to meet the alternative requirements in the final rule. The precision and accuracy requirements for concentrations and for the frequency of measurement are less stringent than those initially proposed in the April 10, 2009 rule; those for masses are the same as those initially proposed.

While this alternative approach (to limiting the error), in itself, limits flexibility, facilities that cannot or choose not to meet these requirements remain free to use the error calculation to demonstrate compliance with the mass-balance error limits. Under the error calculation, facilities have the flexibility to focus on improving the accuracy and precision of those measurements that have a significant impact on the overall error of the estimate rather than expending resources to improve the accuracy and precision of measurements that are not as important to the accuracy and precision of the emissions estimate. EPA is planning to make a calculation tool available to facilities to help them to calculate the error associated with use of the mass-balance approach. Facilities are also, of course, free to use the emission factor method (or, where appropriate, the emission calculation factor method) to estimate emissions.

Under the error limit approach, facilities must demonstrate that the resulting estimate will have a relative error no larger than 30 percent or an absolute error no larger than 3,000 $mtCO_2e$. As noted in the April 12, 2010 proposed rule, these limits address the fact that the mass-balance approach can have large errors because it is calculated as the difference between two large quantities, the inputs and the outputs of the process. However, the absolute error limit provides more flexibility than the relative error limit would by itself. Specifically, it allows use of the mass-balance approach with processes that have low emissions but that cannot meet the relative error limit. It would, for example, allow use of the mass-balance approach with a process with estimated emissions of 6,000 $mtCO_2e$ and a relative error of 50 percent, because such a process would (just) meet the absolute error limit of 3,000 $mtCO_2e$. This is consistent with our approach elsewhere in the rule, where we are allowing use of somewhat less precise methods for smaller emission sources. Nevertheless, to ensure that the estimates for smaller emission sources remain reasonably accurate, we are not simply adopting an emission limit below which the mass-balance approach can be used. This is because a process with small estimated emissions could still have

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[6] At an emission rate of two percent, the 500,000-$mtCO_2e$ throughput limit would result in emissions of 10,000 $mtCO_2e$. The throughput, in combination with the precision, accuracy, and frequency requirements for measurements, would be expected to result in a maximum absolute error of 3,000 $mtCO_2e$.

a high absolute error, meaning that use of the mass-balance approach would lead to an unacceptably uncertain emission estimate. For example, if a process had estimated emissions of 6,000 $mtCO_2e$, but the relative error associated with using the mass-balance approach to estimate these emissions was 150 percent, then the absolute uncertainty of the estimate would be 9,000 $mtCO_2e$. In this case, there would be a significant probability that the process had actual emissions of over 10,000 $mtCO_2e$. Thus, to obtain reasonably accurate process-level and facility-wide emission estimates, it is critical that facilities interested in using the mass-balance approach either calculate the relative and absolute errors associated with the use of the approach or comply with the alternative accuracy and precision requirements described above.

Again, this is consistent with EPA's approach elsewhere in the rule. For continuous process vents that are estimated to emit more than 10,000 $mtCO_2e$ annually, facilities using the emission factor approach must develop an emission factor based on emission testing. Based on the experience of companies that have developed emission factors based on emission testing, EPA estimates that the relative error associated with using the emission factor approach is generally below 30 percent (as one half of a 95-percent confidence interval). Although the error associated with using emission calculation factors (which are based on engineering calculations and assessments) may be higher, emission calculation factors may only be used to estimate emissions from continuous vents whose emissions are estimated to fall below 10,000 $mtCO_2e$. (As discussed in the preamble, we are allowing facilities to use emission calculation factors for all batch processes regardless of size due to several technical issues that make it difficult to develop accurate emission factors for batch process vents based on emission testing.)

Commenter Name: Brian R. Keck
Commenter Affiliation: Air Products and Chemicals, Inc.
Comment Number: EPA-HQ-OAR-2009-0927-106.1
Comment Excerpt Number: 21

Comment: In Section B.ii.2 of the Technical Support Document (TSD), EPA provides the Mass Balance approach equations. The mass of waste removed from the production process in various streams (W_{Dj}) is always assumed to be 'destroyed' by a destruction device with percentage destruction efficiency. This statement appears to assume that the waste is a gas, or entrained in a gas stream, that is directed to a control device such as thermal oxidizer. Is this a correct interpretation?

Response: The stream would not necessarily have to be a gas or vapor. A stream that is recaptured to be destroyed could be a gas or vapor or a liquid stream. There may be instances in which a stream to be destroyed is a liquid stream that may be containerized, e.g., placed in barrels or other containers and sent elsewhere for thermal destruction. The commenter refers to destroyed streams in the mass balance equations; the revised mass balance equations in the final rule include streams that are captured for both destruction and recovery.

Section 4.2.1 - Mass Balance Error Calculation

Commenter Name: Joel R. Hall
Commenter Affiliation: Mexichem Fluor Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0104
Comment Excerpt Number: 3

Comment: The error calculations used to determine if the mass balance approach can be used are onerous and confusing. Mexichem understands the need for a high degree of accuracy and precision for these measurements and that the error test is a means to drive affected entities to obtain accurate data.

Mexichem also appreciates the fact that the agency provided us with an example workbook to show how the errors required to be calculated under the mass balance approach could be calculated for production of HCFC 22 with HFC 23 as a by-product. However, the workbook assumes that the relative error associated with each measurement (including destruction efficiency) is known. In actuality, this will not likely be the case. In addition, it is unclear when the "error test" must take place. The proposed rule states "before using the mass balance approach," but as we understand the calculations, at least one measurement must be taken in order to perform the calculations. If measurements used to calculate fluorinated GHG emissions are to be made monthly as indicated in §98.123(a)(7) then would the error calculations also need to be made monthly? Or should they be made annually when the total estimated emissions are determined? If they are to be made annually, there will be at least twelve data points for some measurements (e.g., reactant fed and removed, product produced, etc.). It is not clear how multiple measurements are to be handled in the error calculations and if a facility waited until the end of the year to perform the error test and "failed" it, they would not be able to estimate their emissions using either of the emission factor approaches unless they had assumed that they would not meet the error test criteria early in the year and begun performing the tests, etc. required to estimate their emissions using one of the emission factor approaches.

Mexichem requests that the agency consider, for the mass balance approach, mandating the use of measuring equipment with an accuracy and precision of one percent full scale or better for measurement of the reactant fed into the process that is used for the mass balance equation and fluorinated GHG product coming out of the process coupled with emission factors or emission characterization of uncontrolled process vents to control devices and an assumption that any unaccounted fluorinated GHG is emitted as a fugitive.

The accuracy requirements under Subpart OO already require that fluorinated GHG product coming out of the process be measured using flowmeters, weigh scales, or a combination of volumetric and density facilities, many of which are likely measuring to this degree already. The mass of fluorinated GHGs sent to a destruction device could be determined using emissions factors or emission characterization of uncontrolled process vents. As indicated in comment # 4 Mexichem would prefer that the emission factors be determined by an engineering assessment rather than an extractive procedure due to the safety concerns associated with sampling HF-containing streams. Yield loss and mass of by-product produced could be calculated based on engineering assessments. Equations L-7 and L-12 could then be used to calculate mass of fluorinated GHG product and by-product emitted from the process.

Response: Please see section II.E.3 of the preamble to this rule for a response to the comments regarding the timing and content of the error test.

As an alternative to the error test, EPA is including in the final rule specific accuracy, precision, and frequency requirements for mass and concentration measurements. In combination with a process throughput limit, these requirements are designed to ensure that emission estimates developed using the mass-balance approach are reasonably accurate and precise. The accuracy and precision requirement for mass measurements under this alternative approach is ±0.2 percent of full scale. Please see the response to comment number EPA-HQ-OAR-2009-0927-0084.1, excerpt 4 for a discussion of these requirements and their rationale.

Regarding a requirement to use measurement equipment with an accuracy and precision of one percent of full scale, EPA has concluded that, under the mass-balance approach, such a requirement would result in emission estimates with high relative errors. For example, for one common process with an emission rate of two percent, such a requirement could easily result in an emission estimate with a relative error of over 70 percent. This is unacceptably high, particularly given that the relative error associated with using the emission factor approach is estimated to be under 30 percent.

The commenter suggests the possibility of using emission factors or emission characterizations to estimate the quantities of fluorinated GHGs sent to the destruction device. The mass-balance approach being finalized requires facilities to measure the mass flows and fluorine concentrations of streams flowing to destruction devices at least monthly. (Measurements must be made more often if this is necessary to meet the error limit or to comply with the alternative to the error limit). If an element other than fluorine is used to estimate emissions, that element is required to be tracked instead. Fluorine concentrations may be determined either by determining the concentrations of individual fluorine-containing compounds in the stream and multiplying these concentrations by the mass fraction of fluorine in each compound or by directly measuring the total fluorine in the stream, e.g., using ASTM D7359-08. Facilities that use the latter approach must also measure, at least once, the concentrations of the individual fluorine-containing compounds in the destroyed stream. This is to allow the correct destruction efficiencies to be applied to the contents of the stream, and to characterize the emissions of any fluorinated GHGs that survive the destruction process. Emissions that cannot be accounted for at vents are assumed to occur through equipment leaks; and emissions from equipment leaks must be assigned the same chemical composition as the weighted average, pre-destruction composition of emissions from process vents.

For purposes of the mass-balance approach, EPA does not consider engineering calculations, rather than measurements, to be adequate to estimating fluorine (or other element) flows into destruction devices. Our concern is that the error associated with such an approach could be quite high. However, under the emission factor approach, EPA now permits engineering calculations to be used under a wider set of circumstances than in the April 12, 2010 proposed rule. Specifically, engineering calculations may be used to estimate emissions from batch process vents. They can also be used to estimate emissions from continuous process vents where controlled emissions (rather than uncontrolled emissions, as proposed) fall under 10,000 $mtCO_2e$, even if the destruction efficiency of the destruction device falls under 99.9 percent. In addition, where emission testing is required, facilities may conduct it after the destruction device in some situations. That is, facilities may estimate a controlled emission factor by testing at the outlet of the destruction device as long as the total emissions from the process vent that are not routed to a destruction device (e.g., during bypass periods) are less than 10,000 $mtCO_2e$. If there are periods during which the vent's emissions are not vented to the destruction device, the revised rule requires that, in addition to developing a controlled emission factor, the facility also develop an emission calculation factor for the periods when the process vent is not vented to the destruction device.

For process vent streams where the total "uncontrolled" emissions are greater than 10,000 $mtCO_2e$, facilities must conduct emission testing on the uncontrolled emissions. Additional flexibility has been added to the rule for uncontrolled streams as well. The final rule allows testing for emission factor development following a wet scrubber that is in place for acid gas removal, either HF or HCl, as long as there is no appreciable reduction of the fluorinated GHG.

We believe that by allowing (1) use of engineering calculations in more situations, (2) development of controlled emissions factors, and (3) development of uncontrolled emission factors following a wet scrubber in place for acid gas control, the final rule will reduce the number of situations in which facilities must measure streams that contain acid gas.

Commenter Name: John Dege
Commenter Affiliation: DuPont
Comment Number: EPA-HQ-OAR-2009-0927-0103.1
Comment Excerpt Number: 13

Comment: Preamble and regulatory language use of "or" and "and" need to be consistent to avoid confusion. EPA: §98.123(a) in the Preamble says that in order to use the mass balance approach "EPA would require that the error associated with the overall estimate of fluorinated GHG emissions fall under 30 percent (relative error) OR under 3,000 $mtCO_2e$ (absolute error)" (emphasis added). Comment: The regulatory text is different from the Preamble text as written which appears inconsistent and confusing to the reader. EPA response when questioned about this issue stated that Preamble and Rule text are just a positive and negative way of stating the requirement, and both are consistent. This is not obvious to reader and definitely needs clarification in the final rule.

Response: EPA agrees that a clarification of the rule text is appropriate. The rule text in §98.123(b)(1) that explains the error calculation criteria has been revised to match the re-proposal preamble text. While EPA notes that the preamble text and the rule text stated the identical criteria at re-proposal, the use of the "or" with "less than" format in the preamble and the "and" with "greater than" format in the rule text proved to be confusing to commenters. The text in the final rule is as follows: "You may use the mass-balance approach to estimate emissions from the process if this calculation results in an absolute error of less than or equal to

3,000 metric tons CO_2e per year or a relative error of less than or equal to 30 percent of the estimated emissions."

Commenter Name: Lorraine Krupa Gershman
Commenter Affiliation: American Chemistry Council
Comment Number: EPA-HQ-OAR-2009-0927-0092.1
Comment Excerpt Number: 11

Comment: We also request clarification on the allowed errors associated with the mass balance approach because the language in the preamble and regulatory text appear to conflict. The regulatory text in §98.123(a) reads "If this calculation shows that use of the mass-balance approach to estimate emissions from the process will result in an absolute error exceeding 3,000 metric tons CO_2e per year and a relative error exceeding 30 percent, then you cannot use the mass-balance approach to estimate emissions from the process." (Emphasis added). However, the preamble explanation on page 18674 states that "EPA would require that the error associated with the overall estimate of fluorinated GHG emissions fall under 30 percent (relative error) or under 3,000 $mtCO_2e$ (absolute error)." (Emphasis added).

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0103.1, excerpt 13.

Commenter Name: John Dege
Commenter Affiliation: DuPont
Comment Number: EPA-HQ-OAR-2009-0927-0103.1
Comment Excerpt Number: 10

Comment: Section 98.123(a) states; "Before using the mass balance approach to estimate your fluorinated GHG emissions from a process, you must estimate the absolute and relative errors associated with using the mass balance approach…" We question the necessity of estimating the absolute and relative errors associated with using the mass balance method on a process, as detailed in the proposed rule. This type of analysis has not been required by any other EPA reporting rule. These equations are quite detailed, and as such, increase the burden on the reporter. We have evaluated the proposed mass balance approach for a very simple process and discovered that this type of analysis is quite complex and is something that only a trained statistician is capable of performing. Process engineers from two of our plant sites were not able to figure out how to use the proposed equations, and felt that a professional statistician or Six Sigma Black Belt would be needed. If EPA believes this analysis is absolutely necessary, we recommend that EPA develop a statistical tool that is very user friendly, which will greatly assist affected sources in assessing the error bands around the mass balance approach.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0084.1, excerpt 4 for a discussion of an alternative set of requirements that facilities can meet to ensure that the emission estimates that they develop using the mass-balance approach are reasonably precise and accurate.

Commenter Name: Lorraine Krupa Gershman
Commenter Affiliation: American Chemistry Council
Comment Number: EPA-HQ-OAR-2009-0927-0092.1
Comment Excerpt Number: 10

Comment: Much of this section has not changed from the April 2009 proposed §98.123. We do support the change to a monthly calculation, instead of the April 2009 proposed weekly calculations. However, we question the necessity of estimating the absolute and relative errors associated with using the mass balance method on a process, as shown in equations L-1 through L-4. These equations are quite complex, and as such, increase the reporting burden.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0084.1, excerpt 4 for a discussion of an alternative set of requirements that facilities can meet to ensure that the emission estimates that they develop using the mass-balance approach are reasonably precise and accurate.

Commenter Name: Brian R. Keck
Commenter Affiliation: Air Products and Chemicals, Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0106.1
Comment Excerpt Number: 25

Comment: Much of Section 98.123 has not changed from the proposed April 2009 language. We do support the change to a monthly calculation, as compared to the April 2009 proposal of weekly calculations. However, we question the necessity of estimating the absolute and relative errors associated with using the mass balance method on a process, as shown in equations L-1 through L-4. These equations are quite complex, and as such, increase the reporting burden.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0084.1, excerpt 4 for a discussion of an alternative set of requirements that facilities can meet to ensure that the emission estimates that they develop using the mass-balance approach are reasonably precise and accurate.

Commenter Name: Craig Holt Segall
Commenter Affiliation: Sierra Club
Comment Number: EPA-HQ-OAR-2009-0927-0128.1
Comment Excerpt Number: 15

Comment: Initially, the mass-balance approach risks substantial uncertainty. Because that approach requires facilities to derive relatively small leakage estimates from differences between the large masses of reactants used and products created, small errors in measurement can translate into substantial variation in leakage estimates. EPA seeks to limit this uncertainty to a maximum relative error of 30%, but this is still a high value: It estimates, for instance, that the uncertainty of the more precise "process vent specific emission factor approach is anticipated to be roughly 10 percent."[7] It is not at all clear why EPA is willing to tolerate the higher uncertainty associated with the mass-balance approach. We do not recommend that it do so in the final rule. If EPA nonetheless retains this approach, it could improve it in several ways. First, EPA should consider specifying specific uncertainty limits for individual steps in the mass-balance process, in addition to setting a maximum uncertainty level. As the TSD explains, setting precise measurement requirements for tools like flow meters and scales "limits error and is straightforward to implement and enforce."[8] It is, certainly, far better than EPA's proposed rule, which would simply require facilities to do several error estimation calculations before using the mass-balance approach.[9] This requirement is very difficult to enforce: EPA cannot readily back-check the assumptions on which such calculations are based, and so must largely take company-derived estimates on faith. EPA could, on the other hand, test to see whether equipment was calibrated according to proper standards. EPA should adopt such enforceable standards instead.

Response: EPA has concluded that use of the error calculation, which requires facilities to explicitly identify and consider the uncertainties associated with their measurements of masses and concentrations, including process variability, will ensure that emissions estimates developed using the mass-balance approach will be reasonably accurate and precise. Contrary to the commenter's assertion that "EPA cannot readily back-check the assumptions on which such calculations are based," EPA will be able to check these assumptions because facilities are required to report, at §98.126(b)(1), the absolute and relative uncertainties calculated for each process, including the quantities used in these calculations and their uncertainties. These uncertainties will consist of the errors associated with mass and concentration measurements, i.e., the accuracy and precision of flowmeters and analytical methods, and the variability of the process. These can be verified by inspecting equipment or process records, if necessary. Under §98.127(c)(1), facilities are required to keep records of the data and calculations used to estimate the absolute and relative errors. In addition, under §98.124(e)(3), facilities are required to document the analytical methods that they use to measure concentrations, including quantitative estimates of each method's accuracy and precision for the analytes of interest at the concentrations of interest. Finally, under §98.127(i), facilities are required to keep records documenting the calibration of all the equipment that they use to measure masses and concentrations, including the industry standards or manufacturer directions used for calibration.

As discussed in the response to comment number EPA-HQ-OAR-2009-0927-0084.1, excerpt 4, EPA is including in the final rule an alternative set of requirements that facilities can meet to ensure that the emission estimates that they develop using the mass-balance approach are reasonably precise and accurate. However, these are intended to be used as an alternative to the error calculation for any given process, not along with it. If both the error and limit and the alternative set of precision and accuracy requirements were applied to the same process, the two sets of requirements would be redundant. The combination would add more complexity to the rule without increasing the precision or accuracy of the estimates.

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[7] 75 Fed. Reg. at 18,678.

[8] Fluorinated Gas TSD at 11.

[9] Fluorinated Gas TSD at 11

The commenter notes that the 30 percent relative error criterion for the mass balance appears less rigorous than the 10 percent error cited for the emissions factor approach. EPA would like to clarify that the 10 percent error that was cited for the emission factor in one part of the preamble to the re-proposed rule is a generally accepted uncertainty for the EPA reference methods for measuring concentrations. Thus, the 10 percent uncertainty cited does not encompass the complete error associated with the emission factor approach. Specifically, the 10 percent uncertainty does not include the additional error in the "emission factor," which includes the uncertainties associated with the variability of the process (which can be significant) and with the measured process activity rate during the testing. As noted in the re-proposed rule, the uncertainty for fluorinated GHG emission factors that was estimated by one facility was approximately ±25 percent (expressed as one half of a 95-percent confidence interval); this estimate included process variability. Finally, additional uncertainties are associated with the process activity level that is multiplied by the emissions factor to estimate actual emissions, and with estimates of emissions from equipment leaks (which do not need to be calculated under the mass balance approach). In summary, therefore, the 10 percent uncertainty does not encompass the full error inherent in the emissions factor approach. EPA therefore believes that the 30-percent relative error limit for the mass-balance approach is comparable to the maximum error that is likely to be associated with estimates developed using the emission-factor based approach for fluorinated GHG emissions from fluorinated gas production.

Commenter Name: John Dege
Commenter Affiliation: DuPont
Comment Number: EPA-HQ-OAR-2009-0927-0103.1
Comment Excerpt Number: 14

Comment: The 3,000 mtn/yr CO_2e error threshold should be increased to 10,000 mtn/yr CO_2e. EPA: §98.123(a) states: "If this calculation shows that use of the mass-balance approach to estimate emissions from the process will result in an absolute error exceeding 3,000 metric tons CO_2e per year and a relative error exceeding 30 percent, then you cannot use the mass-balance approach…" Comment: The absolute error bright-line of 3,000 CO_2e is unrealistic. For an F-GHG with only a GWP factor of 1000, this translates to only 3 mtn of mass, or 0.3 mtn mass using EPA's default GWP factor of 10,000. For a process with small emissions, the relative error is likely to be high, and a GWP or mass emission threshold becomes critical. EPA needs to raise the absolute error threshold to 10,000 mtn/yr CO_2e or greater.

Response: In the final rule, EPA is retaining the proposed maximum absolute error of 3,000 mtCO_2e. As discussed in the proposed rule, this error was developed by multiplying the 30-percent relative error limit by the 10,000 mtCO_2e level used elsewhere in the rule as the level below which less rigorous emission estimation methods are allowed (e.g., engineering calculations rather than emission testing for developing emission calculation factors for vents). (The 30-percent relative error limit is discussed in the proposed rule and in the response to comment EPA-HQ-OAR-2009-0927-0128.1, excerpt 15.) This ensures general consistency across the different estimation methods used in the rule in their treatment of smaller emission sources.

Please see the response to comment number EPA-HQ-OAR-2009-0927-0084.1, excerpt 4 for more discussion of the 3,000-$mtCO_2e$ absolute error limit and the large errors in emissions estimates that could result from eliminating or increasing this limit. Note that in the final rule, facilities are required to use a default GWP of 2,000 rather than 10,000 in calculating the relative and absolute errors of their mass-balance estimates; this change is expected to increase the number of processes with which the mass-balance approach may be used.

Commenter Name: Brian R. Keck
Commenter Affiliation: Air Products and Chemicals, Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0106.1
Comment Excerpt Number: 18

Comment: In [section] B, Fluorinated Gas Production, Section 5.c [of the re-proposal preamble], EPA requests comment on the absolute error limit of 3,000 $mtCO_2e$, while noting that EPA is also considering a higher limit of 5,000 $mtCO_2e$. Air Products supports a higher limit for the absolute error that approaches the rule reporting threshold of 25,000 $mtCO_2e$.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0103.1, excerpt 14.

Section 4.2.1.2 - Set error limit as a percentage of reactants or products

Commenter Name: John Dege
Commenter Affiliation: DuPont
Comment Number: EPA-HQ-OAR-2009-0927-0103.1
Comment Excerpt Number: 15

Comment: The mass balance error estimates need to be based on mass of reactants or products. EPA: On page 18675 of the Subpart L preamble, EPA states “Another approach that would avoid penalizing facilities with low emission rates would be to express the maximum relative error as a fraction of the total mass of reactants fed into (or consumed by) the process.” Comment: We also strongly agree with EPA’s statement that in fact, the proposed mass balance method does penalize F-GHG processes that have low emissions. We evaluated an F-Gas process that had extremely accurate measurements of reactants and products, and fairly accurate measurements of waste streams. The resulting relative error was over 200%, when based on its very small amount of emissions. However, when the alternate method suggested by EPA in the Preamble (p.18675) was evaluated, the relative error was only 15%. Therefore, we recommend that EPA provide this alternate method of relative error calculation as an option in the rule and also as part of the statistical tool to help sources comply with this complex reporting rule.

Response: A response has been provided in section II.E.3 of the preamble to this rule (section II.E, Fluorinated Gas Production (Subpart L)).

Commenter Name: Brian R. Keck
Commenter Affiliation: Air Products and Chemicals, Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0106.1
Comment Excerpt Number: 19

Comment: In [section] B. Fluorinated Gas Production, Section 5.c. [of the TSD], EPA requests comment on another approach to absolute error that expresses the maximum relative error as a fraction of the total mass of reactants fed into the process. Air Products supports this alternative relative error approach for the Mass Balance emissions approach.

Response: A response has been provided in section II.E.3 of the preamble to this rule (section II.E, Fluorinated Gas Production (Subpart L)).

Commenter Name: Joel R. Hall
Commenter Affiliation: Mexichem Fluor Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0104
Comment Excerpt Number: 2

Comment: Mexichem supports the option to use consumption of one of the reactants (e.g., HF or a chlorocarbon reactant) in determining emissions of fluorinated greenhouse gases from production processes under the mass balance approach.

However, we question the need to report the total mass of each reactant fed into and permanently removed from the production process (see §98.126(b)(3) and (4)). If Mexichem is able to use the mass balance approach, it's emission calculations will be based on the amount of chlorocarbon reactant used because HF is used for other purposes in the production process, such as catalyst treatment. Therefore, for Mexichem's production process, the amount of HF fed into the production process will not provide an indication of fluorinated GHG product produced. Attempts to measure the amount of HF permanently removed from the process will result in unnecessary burden. If the agency is going to use reactant data and yield loss as a means to verify or check reported fluorinated GHG production, the mass of the reactant used for the mass balance equation and a balanced chemical equation will suffice.

Response: To allow use of the mass-balance approach with transformation processes and other processes in which fluorinated GHGs are not the product, EPA has revised the mass balance approach to track total fluorine or another element, as long as that element occurs in all of the fluorinated GHGs fed into or generated by the process. The equations are written using fluorine as the default element, but the Agency is allowing facilities to adapt the equations, monitoring, reporting, and recordkeeping requirements to another element as necessary. In the final rule, facilities are not required to report reactants that do not contain the tracked element.

Section 4.2.3 - Allow Alternative MB Approach for Transformation Processes

Commenter Name: Jeff C. Muffat

Commenter Affiliation: 3M Center
Comment Number: EPA-HQ-OAR-2009-0927-0111.1
Comment Excerpt Number: 7

Comment: §98.123 and §98.123 (a), Calculating GHG emissions. The mass balance method that is described in §98.123 (a) precludes the use of this approach for certain production activities. It could not be used for transformations that produce materials other than fluorinated GHGs and isolated intermediates where reactions which produce fluorinated GHGs do not take place. Under the current rule language, transformations which do not produce fluorinated-GHG must use one of the emission calculation factor methods specified in §98.123 (b), (c), or (d). In addition, the two fundamental mass balance equations, Equations L-7 and L-12, are not structured so as to accommodate transformations or other process activities where fluorinated GHGs are not produced with reactions. In the re-proposed Subpart L rule, EPA introduced the concept of the “isolated intermediate.” 3M believes that the “isolated intermediate concept” is an appropriate methodology for managing emission factors in this very diverse and complex source category. However there are many processes where reactions do not occur. This will include simple distillation processes, filtration steps, and packaging operations. While it is still not clear whether this method will be used in any of 3M’s manufacturing operations, we believe that it will be most feasible for those operations described in the previous sentence. In these cases, there may be only a limited number of individual process streams to measure which could improve the utility, cost effectiveness, and accuracy of the emission estimate. 3M believes that the equations could be easily modified so as to replace the Equation L-7 expression, (R*MWP*SCP)/(MWR*SCR), with a term which expresses the mass of product being fed into the process, e.g., P_{IN}. In the case of Equation L-12, the term B_{kip} could be placed with a term that describes any by-products that were produced in an upstream process, e.g., B_{in}. For transformations, it is likely that separate equations would be required. In addition, we believe that it may be appropriate to allow for the mass balance approach for a group of isolated intermediates. There may be cases where a facility would wish to conduct an evaluation on a group of processes which consist of several isolated intermediates. This approach would be somewhat consistent with what EPA proposed in the original Subpart L in April of 2009. The calculations provided in the existing rule would be adequate to reflect the combination of a number of processes.

Response: EPA agrees that facilities should be provided with the option to use the mass-balance approach for transformation processes, and the requirement that facilities apply only the emission factor or emission calculation factor approach to transformation processes has been removed from the final rule. The mass balance approach has been revised to a total fluorine mass balance approach that encompasses not only transformation processes but also processes where no reaction occurs. Rather than assigning any missing mass in the mass balance to product emissions as was required under the re-proposal mass balance option, facilities are required to use emission measurements to assign missing mass to reactant, by-product, and/or product emissions, as appropriate. Alternatively, they may assume that all emissions of fluorine occur in the form of the fluorinated GHG that has the highest GWP among the fluorinated GHGs that occur in more than trace concentrations in the process. Under the revised mass balance approach, facilities would conduct a mass balance on total fluorine and account for all fluorine in to the process and all fluorine out of the process, and determine the total fluorine emitted. The facility would then determine what fraction of the total fluorine is emitted as reactant, by-products, or product by conducting emission characterizations for process vents by measurement to speciate the total fluorine. For larger processes with emissions equal to or greater than 25,000 mt CO_2e, facilities would be required to conduct measurements for certain large process vents, use existing measurements for other process vents, and make assumptions about fugitive emissions based on the contents of vented emissions.

Revisions to the mass balance approach have been made to allow this approach for non-reaction processes, e.g., for distillation processes or filtration processes. Rather than accounting for only the "reactant" or the "product," the equations now incorporate accounting for "inputs" and "outputs" for processes where there is not a chemical reaction. In general, any fluorinated GHG production processes and transformation processes that have accuracy and precision for measurements that allow the error criteria to be met may use the mass balance approach.

Commenter Affiliation: 3M Center
Commenter Name: Jeff C. Muffat
Comment Number: EPA-HQ-OAR-2009-0927-0111.1
Comment Excerpt Number: 21

Comment: While we do not anticipate widespread use of the material balance approach in our facilities, we are requesting that it be made available to certain transformations and chemical operations that do not involve reactions.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0111.1, excerpt 7.

Commenter Name: John Dege
Commenter Affiliation: DuPont
Comment Number: EPA-HQ-OAR-2009-0927-0103.1
Comment Excerpt Number: 12

Comment: §98.123 inappropriately limits the use of mass balance for transformation processes. EPA: Section 98.123 states "…For processes that manufacture CFCs or HCFCs or that transform fluorinated gases into substances other than fluorinated GHGs, you must use the procedure in paragraphs (b), (c) and (d) of the section". Comment: This section restricts the use of mass balance for processes that transform FGHG raw materials to non-FGHG products. The mass balance method in the proposed rule does not allow it to be used for transformation processes that do not produce an FGHG. EPA states that the reason for this is because transformation processes are not required to have the measurement accuracy of FGHG reactants and products. Some transformation processes already measure reactants and products with sufficient accuracy to qualify for using the mass balance approach. Therefore, we believe EPA needs to provide sources with the option to use mass balance approach if the process measures transformed products with the required accuracy of FGHGs. Also, the equations for mass balance assume that any missing mass is the FGHG product. Missing mass is typically a combination of one or more reactants, the final product, waste streams, and by-products. This is a worthwhile simplification, but is likely to overestimate emissions.

The regulation should be rewritten to allow a source the option to use plant knowledge and engineering calculations to determine the portion of missing mass that is FGHG, and if it is an emission. This would be mandatory if the product(s) were not an FGHG and the mass balance approach were employed.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0111.1, excerpt 7.

Commenter Name: Lorraine Krupa Gershman
Commenter Affiliation: American Chemistry Council
Comment Number: EPA-HQ-OAR-2009-0927-0092.1
Comment Excerpt Number: 12

Comment: This section does not allow the use of the mass balance method for processes that transform fluorinated GHG raw materials to non-fluorinated GHG products. Because the emission estimation methodology for transformation process is not defined in subpart L, facilities are forced to use the emission factor approach. The mass balance alternative for all transformations should be included, and this provision should be incorporated into §98.124(b)(1)(i) to require use of compliant monitoring devices for all fluorinated products if using the mass balance alternative. In fact, the mass balance equation should be modified to include all fluorinated GHG processes, not just those that involve reactions. This would include various chemical manufacturing processes where simple distillations or purifications are conducted to produce an isolated intermediate. EPA should also allow for the use of a single mass balance approach on a group of isolated intermediates. This would be appropriate for a process which involves an isolated intermediate which is manufactured, stored, and subsequently purified in a separate step.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0111.1, excerpt 7.

Section 4.3 - Emission Factor and Emission Calculation Factor Methods

Commenter Name: Dave Stirpe
Commenter Affiliation: Alliance for Responsible Atmospheric Policy
Comment Number: EPA-HQ-OAR-2009-0927-0117.1
Comment Excerpt Number: 9

Comment: EPA appropriately provides reporting facilities the option to modify the existing emission factor compliance system that many fluorochemical manufacturers use today to demonstrate compliance with a variety of Clean Air Act obligations. Subpart L facilities comply with several Maximum Achievable Control Technology (MACT) standards in 40 CFR 63. The emission factor approach proposed in the new Subpart L will allow reporting facilities to adapt their existing reporting systems to meet Part 98 reporting obligations in the most efficient and consistent manner possible.

Response: EPA appreciates the commenter's support for its efforts to provide flexible, accurate monitoring methods to facilities in the fluorinated gas production source category.

Commenter Name: Lorraine Krupa Gershman
Commenter Affiliation: American Chemistry Council
Comment Number: EPA-HQ-OAR-2009-0927-0092.1
Comment Excerpt Number: 13

Comment: We support EPA's inclusion of the emission factor and emission calculation factor methods in this proposal, as we noted in our June 2009 comments on this subpart.

Response: EPA appreciates the commenter's support for its efforts to provide flexible, accurate monitoring methods to facilities in the fluorinated gas production source category.

Section 4.3.1 - Preliminary Estimate of Emissions by Process Vent

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 11

Comment: EPA should clarify proposed §98.123(b)(1), or provide a note in a final Subpart L preamble, that process simulation models, such as ASPEN® by Aspen Technologies Inc., satisfy engineering calculations requirements for Subpart L process evaluations. At first appearances, this proposed provision seems to infer that §98.123(b)(1)(i) describes typical batch emission calculation methods, and §98.123(b)(1)(ii), Engineering Assessments, describes typical continuous process emission determination methods. At 75 Fed. Reg. 18679/1, EPA describes common batch emissions calculation examples for where engineering calculations describe emissions. EPA describes the variety of batch emissions events in this preamble, but does not describe common continuous process vent activities. We have learned from EPA that this batch versus continuous distinction was not intended. One method to alleviate this interpretation is for EPA to clarify that continuous process models, such as ASPEN, are suitable to satisfy proposed §98.123(b)(1)(i), and that bench scale models may be used for either continuous or batch processes.

Response: As discussed in the preamble of the final rule, we are not requiring that facilities perform a preliminary calculation of emissions from batch process vents; instead, facilities are allowed to develop emission calculation factors based on engineering calculations or assessments for all batch process vents, regardless of emissions. However, for purposes of performing preliminary calculations for continuous process vents, and for purposes of developing emission calculation factors for either continuous or batch process vents, we have clarified that engineering calculations and engineering assessments may be used for both batch and continuous process vents, using the methods described in §98.123(c)(1)(i) and (ii) [formerly §98.123(b)(1)(i) and (ii) in the April, 2010 proposed rule], as appropriate. The engineering calculations noted include the batch calculation methods in the Emission Inventory Improvement Program (EIIP), batch emission calculations from the Miscellaneous Organic NESHAP, and use of commercial software products. Engineering assessments can be based on multiple types of approaches, as included in the engineering assessment paragraph (§98.123(c)(1)(ii)). The engineering calculations and the engineering assessments are available for preliminary emissions estimates for batch and continuous processes. The equations focus on batch operations; however, they could be used for continuous processes to the extent they are applicable. For example, if a continuous process included a reaction that generated a fluorinated GHG byproduct that is vented at some point, then the gas evolution equation would be applicable for that process. The other available options, both use of commercial software products and engineering assessments, are available for continuous processes but may be used for estimating emissions from batch processes as well, to the extent applicable. For example, if a facility has previous measurement data or test results on a batch process, these may be used to estimate emissions from the process or to inform the batch calculations. Because the available approaches include use of commercial software products, use of the ASPEN process simulation models mentioned by the commenter would be appropriate and allowed. Other software products, such as WATER9, may also be used in applications to estimate fluorinated GHGs from process vents. Facilities are required to keep records of the data and calculations used to develop their preliminary estimate of emissions for each process vent; they should have records available and be able to explain how their use of a particular emissions estimation method for a particular vent is appropriate.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 9

Comment: Arkema appreciates EPA proposing the Engineering Assessment process as a screening step to rationalize emission source testing later in Subpart L. EPA should clarify that reporters evaluating continuous processes begin their analysis at §98.123(b)(1)(ii). EPA should also clarify that existing process vent characterization data that substantially documents the Engineering Assessment parameters satisfy this provision.

Response: EPA appreciates the commenter’s support in its efforts to provide flexible, accurate monitoring methods to facilities in the fluorinated gas production source category.

With respect to requirements for continuous process vents, please see the response to comment number EPA-HQ-OAR-2009-0927-0085.1, excerpt 11.

EPA agrees that existing process vent characterization data for the engineering assessment satisfies the provision, if the existing data are representative of the current operating scenario of the process. These data the commenter mentions would be comparable to requirements in

§98.123(c)(1)(ii) for engineering assessments.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 12

Comment: Other common process calculation methods, such as EPA WATER9 wastewater emissions models, may be appropriate to calculate emissions from some fluorinated gas process operations. EPA should confirm that any emissions model appropriate for process emission calculations may meet the §98.123(b)(i)(C) "[c]ommercial software products that follow chemical engineering principles" definition. Reporters should document these emission calculation methodologies in their Subpart A GHG Monitoring plans.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0085.1, excerpt 11.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 23

Comment: The § 98.123(b)(i)(B)(4)(iii) requirement to perform a material balance for each component in any batch manufacturing system employing condenser emission controls is unnecessary. This requirements seems to stem from § 63.1257(d)(3)(iii)(B), where a facility operating a condenser as a batch emission control device may either perform a material balance across the condenser system or show that the material in the underlying vessel is not boiling. Furthermore, this §63.1257 condition only applies when the condenser is the last control device in a control device system. EPA has not explained why forcing facilities to perform material balances for each component in a condenser control device system is necessary. Facilities subject to this subpart already comply with the underlying §63.1257 requirements, and may need to change their underlying MACT compliance programs, or comply with both portions of the MACT control requirements, to meet Part 98 conditions. The Climate Change Reporting Rule should not require duplicative compliance requirements. EPA should delete proposed §98.123(b)[1](i)(B)(*4*)(*iii*) in deference to §63.1257(d)(3)(iii)(B).

Response: As discussed in the preamble of the final rule, we are not requiring that facilities perform a preliminary calculation of emissions from batch processes; instead, facilities are allowed to develop an emission calculation factor based on engineering calculations or assessments for all batch processes, regardless of size. To develop emission calculation factors, facilities must follow the equations and process condenser definition consistent with 40 CFR 63, subpart FFFF, Miscellaneous Organic NESHAP. With respect to §63.1257(d)(3)(iii)(B), the Miscellaneous Organic NESHAP requirements do not point to this paragraph of the 40 CFR 63, subpart GGG, Pharmaceuticals NESHAP. Because the subpart L requirements include the process condenser definition from the Miscellaneous Organic NESHAP, use of the terms process condenser and air pollution control device condenser in §63.1257(d)(3)(iii)(B) would not match the definitions for subpart L. Under the MON process condenser definition, a facility would likely not be able to demonstrate 99 percent efficiency for many process condensers, and the requirement in §63.1257(d)(3)(iii)(B) for demonstrating that the exit gas temperature is less than the boiling or bubble point is based on the premise of the Pharmaceutical process condenser definition; part of the Pharmaceutical process condenser definition is that the liquid in the process vessel must be above the boiling or bubble point. (In the case where a process vessel is heated but not boiling, and vapors from the vessel are recovered in a condenser, this condenser would technically be a control condenser under Pharmaceuticals, although it could be a process condenser under the MON). The requirement in §63.1257(d)(3)(iii)(B) to show the exit gas temperature is less than the boiling or bubble point is related to a process vessel with liquid at the boiling or bubble point.

The commenter noted that the material balance requirement in §98.123(b)(1)(i)(B)(*4*)(*iii*) may stem from §63.1257(d)(3)(iii)(B), Initial compliance demonstration for condensers, but the material balance requirement is actually from 40 CFR 63.2460(b)(4)(iii), Miscellaneous Organic NESHAP requirements and unrelated to §63.1257(d)(3)(iii)(B). At promulgation of the Miscellaneous Organic NESHAP (following petitions for judicial review), EPA responded to public comments by incorporating a requirement to conduct a material balance on each component across the condenser. See preamble discussion at 71 FR 40323; July 14, 2006. To estimate the process emissions correctly, facilities must base the calculation on the condenser receiver component composition and the condenser exit gas temperature condition; the condensate receiver composition for the process condensers is often not available. In the final subpart L rule, the material balance requirement has been revised to note that the material balance on each component is not required if the condensate receiver composition for the process condenser is known.

In summary, to develop the emission calculation factor, the facility estimates the actual emissions following all process condensers to determine the uncontrolled emissions. If a process has a control condenser under the MON definition, the facility may calculate the emissions following the control condenser to determine the controlled emissions. Emission calculations included in §98.123(c)(1)(i) in the final rule point to the appropriate calculations to allow this.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 22

Comment: EPA should correct the §98.123(b)(1)(i)(B) citation “except as specified in paragraphs (b)(1)(i)(B)(*1*) through (b)(1)(i)(B)(*7*) of this section,” where the section only includes four subsections.

Response: EPA agrees with the correction comment and has corrected the references for

§98.123(c)(1)(i)(B)(*1*) through (*4*) in the final rule.

Commenter Name: Brian R. Keck
Commenter Affiliation: Air Products and Chemicals, Inc.
Comment Number: EPA-HQ-OAR-2009-0927-106.1
Comment Excerpt Number: 5

Comment: Reduce the complexity of the emission calculation methods.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0111.1, excerpt 1.

Commenter Name: John Dege
Commenter Affiliation: DuPont
Comment Number: EPA-HQ-OAR-2009-0927-0103.1
Comment Excerpt Number: 17

Comment: The option to use engineering calculations for the preliminary estimate of emissions by process vent in §98.123(b), and the scoping study is critical and should be further clarified. EPA: The preamble on page 18674 states: "For purposes of estimating the mass of fluorinated GHG emitted from the process, facilities could use the same types of engineering calculations that they would use to determine whether process vent testing was required under the PSEF approach." Comment: The proposed definition of trace compounds in subpart A of the rule is less than 0.1%. Being able to detect each GHG in our vent streams down to 0.1% will take significant development work to select the proper analytical method, equipment and standards to do the measurement. This program will take many months and will entail significant cost. Section 98.123(b) requires facilities to do a preliminary estimate of process vent emissions to determine emission factor development methodology, and section 98.124(a) requires a scoping study. DuPont supports EPA's decision to allow a variety of emission determination methods for these studies, but believes it can be further clarified. At one of our sites we believe our permitting application calculation basis will meet the requirements for preliminary estimate of emissions to determine which vents would be >1 Mt/yr before control. These calculations were also acceptable to use for the Miscellaneous Organic NESHAP MACT process vent calculations, and makes good sense they are suitable for FGHG emission calculations as well. This site has approximately 170 emission points that potentially contain FGHGs at some concentration so documenting new calculation methodologies would be a significant burden, and unjustified when Title V and HAP regulations have deemed these existing calculations are suitable. There are Pharmaceutical MACT calculations (40 CFR 63.1257...) referenced in the Miscellaneous Organics NESHAPs as acceptable calculation methods (see §98.123(b)(1)(i)(B)). Under the Pharmaceutical MACT the use of calculations to comply with other enforceable rules are deemed as acceptable calculation alternatives: "Modified versions of the engineering evaluation methods in paragraphs (d)(2)(i)(A) through (H) may be used if the owner or operator demonstrates that they have been used to meet other regulatory obligations, and they do not affect applicability assessments or compliance determinations under this subpart GGG. [40 CFR

63.1257(d)(2)(ii)]". EPA should incorporate a similar provision to further clarify suitable engineering calculations alternatives.

Response: EPA has clarified in the final rule that the preliminary emission estimates may be used for both process vents and for identifying processes to be included in the initial scoping test. With respect to use of previously conducted engineering calculations or measurements to estimate emissions, we agree that existing data and existing calculations (i.e., conducted prior to the subpart L effective date) that meet the calculation methods in subpart L may be used to satisfy the rule requirements, both for preliminary calculations and for calculations needed for developing the emission calculation factor. It has also been clarified in the final rule that calculations conducted to determine emissions under other regulatory programs may be used for the preliminary emissions estimate. However, to develop emission calculation factors for process vents, the final rule requires that facilities conduct a calculation for the emissions for the process vent to develop the emission calculation factor under subpart L. We have continued with this requirement in the final rule as emissions are often estimated as worse-case estimates or as maximum allowable emissions under other programs. Under subpart L emission estimates for emission calculation factor development, the emissions should be representative of typical operation, rather than worst-case.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 10

Comment: EPA has proposed a two-step process vent GHG emissions evaluation process. In the first step, the engineering assessment, EPA allows facilities to screen individual vents using a 10,000-mtpy CO_2e basis to determine further testing requirements. Arkema appreciates the flexibility inherent in the screening approach inherent in proposed §98.123(b), where reporters may use engineering calculations to characterize process vents emitting below 10,000 metric tons per year ("mtpy") carbon dioxide equivalent ("CO_2e"). Arkema also appreciates the possibility, outlined at 75 Fed. Reg. 18678/3, where EPA would review existing measurement data for possible use in the proposed §§98.123 and 98.124 FGHG emission determination process. Existing valid data that meets EPA data collection procedures should be used when available.

Response: EPA appreciates the commenter's support for including a process-vent threshold for the process-vent-specific emission factor and emission calculation factor approach. We agree that existing data and existing calculations that meet the calculation methods in subpart L may be used to satisfy the rule requirements.

For more discussion of this issue, please see the response to comment number EPA-HQ-OAR-2009-0927-0103.1, excerpt 17.

Section 4.3.2 - Cut-offs for Low-Emission or Controlled Process Vents

Commenter Name: Jeff C. Muffat
Commenter Affiliation: 3M Center
Comment Number: EPA-HQ-OAR-2009-0927-0111.1
Comment Excerpt Number: 25

Comment: In §98.123 (b)(2)(i), EPA has proposed a mass emission and control threshold. For those processes which will not be using the material balance methods that are listed in §98.123 (a), this paragraph delineates whether the Preliminary estimate of emissions by process vent summarized in §98.123(b)(1) are adequate or whether the more onerous Process-vent-specific emission factor method summarized in §98.123(b)(3) will be required. 3M agrees that the methods used to measure and report emissions should be commensurate with the emissions quantity. In addition, while we are providing comment on the feasibility, costs, and accuracy of the methods that are required for batch process vents (as currently required in the rule), we also recognize that additional field verification will be needed to verify and confirm the results of the engineering estimates that are routinely conducted for batch processes in the past for our most significant sources. There are several changes to the thresholds that are listed in §98.123(b)(ii) which would afford greater flexibility in the use of the engineering estimates that are listed in §98.123(b)(1) without substantively compromising the integrity of the emission factor

Response: EPA appreciates the commenter's support for including a process-vent threshold for the process-vent-specific emission factor and emission calculation factor approach.

Commenter: Jeff C. Muffat
Organization: 3M Center
Comment Number: EPA-HQ-OAR-2009-0927-0111.1
Comment Excerpt Number: 9

Comment: Destruction Efficiency. We are requesting that the 99.9% destruction efficiency that is listed in §98.123(b)(2)(i)(B) be adjusted to whatever the established performance efficiency of the process is determined to be. 3M has conducted destruction efficiency testing on a thermal oxidizer that is used to treat fluorinated-GHG emissions. With the exception of perfluoromethane (CF_4), none of these chemicals has ever been measured above the method detection limit at the outlet of this unit. The chemical-specific destruction efficiencies have been based on the method detection limits for each chemical. For past reports, we have utilized these measured chemical-specific destruction efficiencies in determining outlet emissions from the oxidizer. Since the values of some of the input constituents can be quite low, the destruction efficiencies have also been low. Where the concentration of the inlet value is high and/or where the outlet detection limit is low, the destruction efficiencies are also high. For example SF_6, which has a very low detection limit, has a calculated DE of nearly 100%. With the promulgation of these rules, 3M will likely adopt a modified approach. EPA provides for the use of an appropriate chemical "surrogate" and it is possible that a 100% DE has already been established for most of the materials that are present, i.e., value obtained for SF_6 demonstrates 100% DE. In the case of perfluoromethane, 3M believes that the DE values established during the past testing (and any future tests) should be adequate and a DE value of any amount should be sufficient if it is based on the test conditions that are established in the rules.

Response: A response has been provided in section II.E.3 of the preamble to this rule (see section II.E, Fluorinated Gas Production (Subpart L)).

Commenter: Jeff C. Muffat
Organization: 3M Center
Comment Number: EPA-HQ-OAR-2009-0927-0111.1
Comment Excerpt Number: 11

Comment: In addition to a modified determination threshold, 3M also requests that the determination thresholds listed in §98.123 (b)(2)(i) (A) and (B) be the sum of the controlled and uncontrolled emissions. Voluntary control devices may be used in certain applications and/or situations may exist where bypasses occur around thermal treatment devices. During these situations, the facility would simply report the sum of the controlled and uncontrolled emissions using methods that are described in §98.123 (b)(1) with the destruction efficiency being used to determine the chemical specific destruction efficiency at the outlet of the thermal treatment device. 3M currently uses this method today. If and when the determination threshold was exceeded, the facility would presumably be required to conduct emissions estimates using an alternative method and within a reasonable time frame.

Response: A response has been provided in section II.E.3 of the preamble to this rule (see section II.E, Fluorinated Gas Production (Subpart L)).

Commenter Name: Jeff C. Muffat
Commenter Affiliation: 3M Center
Comment Number: EPA-HQ-OAR-2009-0927-0111.1
Comment Excerpt Number: 22

Comment: We are recommending certain changes to the thresholds that have established for the “preliminary estimates” and vent testing requirements. This includes the threshold itself as well as the destruction efficiency requirement.

Response: A response has been provided in section II.E.3 of the preamble to this rule (see section II.E, Fluorinated Gas Production (Subpart L)).

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 14

Comment: EPA appropriately does not require source testing of vents emitting, on an uncontrolled basis, less than 10,000-mtpy CO_2e at proposed §98.123(b)(2)(i)(A). However, EPA should further clarify that, below a certain threshold that reporters need only document that a specific vent does not have a potential to reach a specific fraction of this 10,000-mtpy CO_2e level. In the Title V program, permitting authorities typically reduce calculation scrutiny for vents emitting less than 5% of the major source thresholds for all regulated pollutants. Applying this logic to Subpart L, we recommend that EPA only require listing of process vents with an uncontrolled potential to emit of less than 5% of the 10,000-mtpy CO_2e threshold, or less than 500-mtpy CO_2e per vent.

Response: No de minimis level of emissions or minimum evaluation threshold has been included in the final rule. Because this is a reporting rule, we consider it appropriate to require reporting of emissions from all processes and emission points included in subpart L. However, the rule recognizes that the effort required to estimate emissions should be reflective of the magnitude of the emissions, and for continuous vents, a process vent threshold of 10,000 mtCO_2e has been included, with differing levels of effort for those above and below this level. For continuous process vents above this level, facilities are required to conduct emissions testing to develop the emissions factor; for continuous process vents below this level, facilities are required to conduct calculations to develop the emission calculation factor.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 15

Comment: Not all FGHGs may be listed in Table A-1. For consistency, we recommend that EPA use a similar 5% minimum evaluation threshold for non-Table A-1 compounds to provide a minimum review threshold. This mass rate threshold for non Table A-1 compounds would be 0.05 tpy (100 pounds per year (“lb/yr”)). This proposal would allow reporters to minimize the effort required to document very small vents that do not significantly contribute to FGHG emissions.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0085.1, excerpt 14.

Commenter: Jeff C. Muffat
Organization: 3M Center
Comment Number: EPA-HQ-OAR-2009-0927-0111.1
Comment Excerpt Number: 10

Comment: Mass Reporting Thresholds. Fluorinated-GHG’s that are not listed in Table A-1 are present in most of 3M’s process air exhausts and as a practical matter the 10,000 mT CO_2e listed in this paragraph will not be used for compliance determinations. By default 3M will be using the 1 mT /year threshold. In EPA’s requests for comments they have considered other thresholds and a 10,000 pound mass fluorinated-GHG threshold was provided as an example. This value provided by EPA is better aligned with the permitting thresholds that have been listed in the Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule. In that rule EPA has indicated that even in the latter stages of this program, permitting would not be required for sources below 50,000 mT CO_2e /yr. 3M requests that the determination value be increased to the 10,000 lb mass F-GHG/year level. The example provided in Attachment 1 illustrates the value of the increased threshold. In this case, emissions of non-Table A-1, low GWP materials would not be required for a number of operating scenarios.

Response: As discussed in the preamble of the final rule, EPA has made several changes to the manner in which facilities are required to make preliminary estimates of emissions for comparison with the 10,000 $mtCO_2e$ cut-off. One of these is to require facilities to use a default GWP of 2,000 to estimate the CO_2e of fluorinated GHGs that do not have a GWP listed in Table A-1. (Facilities may also request to use a provisional GWP; the circumstances under which they may make this request are discussed in the preamble.) At a GWP of 2,000, the 10,000-lb mass threshold suggested by the commenter equates to 9,091 $mtCO_2e$, which is very close to the 10,000 $mtCO_2e$ threshold in the final rule. Please see the response to comments regarding GWPs and the process vent threshold that has been provided in section II.E.3 of the preamble to this rule (see section II.E, Fluorinated Gas Production (Subpart L)).

Commenter Name: John Dege
Commenter Affiliation: DuPont
Comment Number: EPA-HQ-OAR-2009-0927-0103.1
Comment Excerpt Number: 16

Comment: If EPA is not able to incorporate a provision to calculate GWP for chemicals not listed on Table A-1, the agency should adopt a 10 mtn/yr mass exclusion level for determining the appropriate emission factor methodology in section 98.123(b)(2)(A).

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0111.1, excerpt 10.

Commenter Name: Craig Holt Segall
Commenter Affiliation: Sierra Club
Comment Number: EPA-HQ-OAR-2009-0927-0128.1
Comment Excerpt Number: 17

Comment: The process-specific emissions factor approach avoids some of these problems [with the mass-balance approach], and EPA should maintain it for most sources. We urge EPA to reject suggestions that would weaken that approach. In particular, EPA should limit the use of engineering calculations, instead favoring direct monitoring of process vents, and should not raise the emissions threshold below which such calculations can be used.

Response: As discussed in the preamble of the final rule, EPA is permitting the use of engineering calculations to estimate emissions from batch process vents, regardless of size, due to technical issues that make it difficult to develop accurate emission factors for batch process vents based on emission testing. For continuous process vents, EPA has retained the 10,000 $mtCO_2e$ cut-off for emission testing, although we have changed the manner in which facilities are required to make preliminary estimates of emissions for comparison with the 10,000 $mtCO_2e$ cut-off. These changes make reasonable accommodations for the use of control devices and for emissions of fluorinated GHGs that do not have GWPs listed in Table A-1. With these changes, EPA believes that the rigor of emission estimation method is appropriately linked to the size and technical characteristics of the emissions source.

Commenter: Craig Holt Segall
Organization: Sierra Club
Comment Number: EPA-HQ-OAR-2009-0927-0128.1
Comment Excerpt Number: 12

Comment: We also support EPA's decision to use uncontrolled emissions to determine the rule's applicability, rather than controlled emissions. Control devices may malfunction and facilities may develop leaks or emit by-products that control devices cannot address. Facilities should not, therefore, be able to rely upon control devices to evade reporting.

Response: EPA appreciates the comment.

Commenter Name: Lorraine Krupa Gershman
Commenter Affiliation: American Chemistry Council
Comment Number: EPA-HQ-OAR-2009-0927-0092.1
Comment Excerpt Number: 16

Comment: For those streams that are fed to a destruction device, measuring GHG emissions post-destruction device provides an incentive for facilities to reduce GHG emissions as well as alleviate much of the burden of this subpart.

Response: Under the revised approach for conducting emissions testing for emission factor development, facilities may estimate a controlled emission factor by testing at the outlet of the destruction device, as long as the total "uncontrolled" emissions, i.e., during periods when the process vent is not vented to the destruction device, are less than 10,000 $mtCO_2e$. In addition to the controlled emission factor, if a process experiences any periods when not vented to the destruction device, the facility must also develop an emission calculation factor for these periods when the process vent is not vented to the destruction device. The final rule also allows testing for emission factor development following a wet scrubber that is in place for acid gas removal, either HF or HCl, as long as there is no appreciable reduction of the fluorinated GHG. For process vent streams where the total "uncontrolled" emissions are greater than 10,000 $mtCO_2e$, facilities must conduct emission testing on the uncontrolled emissions.

Commenter Name: Lorraine Krupa Gershman
Commenter Affiliation: American Chemistry Council
Comment Number: EPA-HQ-OAR-2009-0927-0092.1
Comment Excerpt Number: 17

Comment: In addition, it [i.e., measurements post-destruction device] removes any safety risk to employees and contractors from having to sample hazardous materials in high concentrations (such as HF) that may be present in upstream processes.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0092.1, excerpt 16.

Commenter Name: Lorraine Krupa Gershman
Commenter Affiliation: American Chemistry Council
Comment Number: EPA-HQ-OAR-2009-0927-0092.1
Comment Excerpt Number: 19

Comment: Facilities constantly monitor the operation of destruction devices, and would be able to quickly react to any failure in the destruction device. (For example, caustic wet gas scrubbers are continuously monitored for the injection flow rate, differential pressure across the packed sections, and pH.) Allowing for the use of engineering calculations for periods when the destruction device(s) are offline would ensure accurate GHG emissions accounting.

In addition, EPA should explicitly cross-reference existing compliance obligations under 40 CFR 51, 52, 60, 61, 63, 64, 65, 70, 71, and 75 as appropriate compliance methods for process units impacted by one or more of these requirements.

Response: Regarding the estimation of emission during periods when destruction devices are on- or off-line, please see the response to comment number EPA-HQ-OAR-2009-0927-0092.1, excerpt 16. The current compliance monitoring obligations (e.g., compliance assurance monitoring under 40 CFR 64, or compliance monitoring under 40 CFR 63) from other regulatory programs applicable to control devices in place for fluorinated GHGs are not specifically cross-referenced in the final rule. However, the rule does require that facilities report emissions that may occur from malfunctions of control devices or processes or that occur during periods when the control device is operating outside of operating conditions set for the device in the facility’s operating permit. .

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 18

Comment: EPA should also keep in mind that the relationship between process stream contents and process vent emission rates varies between processes and within processes. A vent stream seemingly potentially causing substantial potential emissions, may, for process reasons, not contribute to potential FGHG emissions. Another process stream with seemingly trivial amounts of FGHG may, for process reasons, become a significant FGHG emissions contributor. Because the relationship between stream content and FGHG emissions are necessarily case-by-case determinations, EPA should carefully weigh any inferences before concluding any relationship between stream composition and FGHG emission rates.

Response: EPA agrees that stream composition is not necessarily related to fluorinated GHG emission rates, e.g., in cases where the stream or some components of the stream are recaptured or destroyed. The initial scoping test is intended to identify the set of fluorinated GHGs that occur in the process and therefore may be emitted by it, not necessarily the fluorinated GHGs that are emitted from the process. Nevertheless, EPA expects that facilities will include in their emissions measurements (emission testing or emission characterizations) fluorinated GHGs that have been identified in the initial scoping test and that could occur in the tested stream.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 19

Comment: EPA should clarify that this limit is per vent in batch applications, and not for individual batch steps vented through the same emission point. EPA should also explain how the 99.9% destruction and removal efficiency ("DRE") criteria at proposed §98.123(b)(2)(i)(B). We believe that the 99.9% was derived from EPA's control device efficiency research conducted to support this proposal. However, EPA should allow post-control efficiencies for vents that may be controlled by DRE less than 99.9%. We believe that, were we to find FGHG vents controlled by less than 99.9% DRE, the proposed regulation requires us to switch to the uncontrolled calculation basis. Similar requirements in other EPA authorities, such as the Hazardous Organic NESHAP ("HON") at 40 CFR 63 Subpart G, recognize control efficiencies of 95% or greater. This strict cutoff may cause unnecessary characterization of controlled FGHG vents and serves as a disincentive for reporters to control supplemental vents when less than 99.9% DRE is available.

Response: As discussed in the preamble, we are allowing facilities to use emission calculation factors for all batch processes regardless of size due to several technical issues that make it difficult to develop accurate emission factors for batch process vents based on emission testing.

Please see the preamble to the final rule for a discussion of how the final rule requires facilities to treat destruction efficiencies in their preliminary estimates of emissions from the process vent.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.

Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 16

Comment: EPA should adopt a low-concentration floor below which reporters do not need to document FGHG content of process streams. Several process streams in fluorochemical manufacturing process units may contain a trivial amount of FGHG, causing trivial amounts of FGHG emissions. At §98.416(c) and (d) of Subpart OO, EPA defines a floor below which FGHG reporting is not required. EPA should adopt a similar guideline, based on Subpart OO conditions in effect when Subpart L reporting begins, allowing reporters to not document process streams containing less than the Subpart OO mass concentration threshold in effect when Subpart L reporting begins. Arkema expects to identify several process streams, including co-product hydrochloric acid, containing minimal FGHG concentrations that will not significantly impact actual FGHG process emissions. This minimum FGHG concentration threshold will allow reporters to concentrate on documenting FGHG contents of streams that could potentially impact actual FGHG emissions.

Response: Please see section 10 of this RTC document for discussion of trace concentrations, including the definition of “trace concentration” and how trace concentrations are treated in the monitoring provisions of the final rule.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 43

Comment: Third, EPA should clarify that the 99.9% DRE requirement for control devices not regulated by the HWC MACT is not a permit limit, and that reporters only need to recalculate FGHG DRE. EPA should clarify that this process change provision does not constitute an emission control requirement and does not require reporters to replace emission control devices during a process change.

Response: The process vent threshold criterion for DE has been eliminated from the final rule. While no longer in the rule, we would like to clarify that at re-proposal it was not meant to be an emission control requirement.

Please see section II.E.3 of the preamble to this rule for more discussion of this issue.

Section 4.3.4 - Emission Factor Approach

Commenter Name: Jeff C. Muffat
Commenter Affiliation: 3M Center
Document Control Number: EPA-HQ-OAR-2009-0927-0111.1
Comment Excerpt Number: 28

Comment: Batch Processes Vents. Where as we commonly characterized our continuous process vents using the methods that are proposed in the rule, these same procedures have not been utilized on many batch process vents. 3M understands EPA's desire for field verification in the form of specific vent gas emission testing and we are prepared to undertake this effort for the most significant emission sources. However, batch processes present unique vent testing challenges. This has been recognized in a number of previous EPA-rulemaking activities. There is no single approach which can be used for emissions characterization and in some cases a combination of methods must be employed to obtain the appropriate emission factor. We believe that EPA should simply allow for the use of the methods that are described in §98.123 (b)(1) with the additional requirement that more generally states that "Batch emissions in excess of the determination threshold must include some field verification, in the form of stack gas measurements that characterize the major emission events."

The specific concerns with batch testing requirements are summarized in greater detail below:

1. Many batch processes have extended cycle times, i.e. 24-48 hours. The time required to complete three test cycles could take weeks. With a continuous process, some determination of RSD conformance could be made at the time of the test. This would not be the case with batch processes where data would be collated well after the test is completed. We believe that compliance with an RSD for each constituent would require six (6) tests for all batch processes requiring additional field tests. Where products are made on a campaign basis, this could require in excess of one year for completion. There are also may be cases where six (6) tests could not be completed and the rules should provide for some relief when sufficient tests cannot be conducted.

2. In previous regulatory initiatives, EPA has recognized the uniqueness of batch processes. At the request of 3M, Dixon Environmental has summarized these various references and findings in Attachment 2. The major themes that are captured in the document are listed below:
a. Engineering calculations that are based on chemical engineering principals have been recognized as the "state-of-the art" for batch processes and in many cases they are the required method.
b. The methods described in (a) cannot always be utilized. In these cases, previous rulemaking efforts have acknowledged that a multitude of approaches listed under §98.123(b)(1) could be utilized. The default requirement has never been vent testing.

3. We have certain processes where batch emissions can be measured using the methods that are listed in the rule. In some cases, processes will be discharged through induced draft fans that operate at a constant flow rate. Measurement in these processes is not dissimilar to continuous operations since only chemical concentration will vary. However, more commonly these vents will consist of small diameter process piping where the use of traditional gas flow measurement devices are not effective or where piping and equipment modifications are not feasible and/or safe. We are concerned that the integration of varying concentration with varying flows will severely limit the usefulness of this information for all emission episodes. Operations that may be particularly difficult to measure include:
a. Depressurizations where gas flows are not continuous and/or which will begin and conclude quickly.

b. Vapor displacement, which may occur during reactor filling, resulting in extremely low and non-measurable air flows.
c. In some cases, a number of samples may be obtained to monitor the reaction process and each could involve a minor depressurization. These steps are normally not significant emission contributors but each constitutes a separate "episode" which would require measurement.

4. 3M currently uses a combination of lab, pilot plant, and factory data to develop emission factors for some its major batch processes. Data from process development at the laboratory and pilot plant scale is combined with factory data to establish an estimated material balance model for the processes, providing a fairly accurate picture of air and water emissions, waste to incineration, and estimated product output. A detailed analysis of these major streams is also necessary to understand levels of potential by-products and overall product quality. Many techniques are employed for stream analyses including F-NMR, H-NMR, GS-MS, LC, IC, and ICP. During scale-up at the factory level, critical streams are sampled and compared against the original model which is adjusted accordingly.

These analyses are used to 1) establish the extent of reactions for the primary (formation of product) and secondary reactions (byproducts, side-reactions), and 2) determine how the components (primary product, by-products, components from side reactions, and inert compounds), partition between the process streams. The extent of reaction and partitioning data for the major components is then applied to minor components using engineering judgment (physical property information, water solubility, etc.) whose levels are either below detection limit or where there is more uncertainty in the analytical data (e.g., the component may be above detection limit in one stream but below the detection limit in another stream).

The resulting compositions predicted by the material balance model is cross checked against the individual stream analyses of critical components, raw material charges, and stream flow measurements to achieve an overall fit to the data available. The material balance model is constructed so that the balance must close for every species for each step of the operation as well as the operation overall. While there are estimates and assumptions made using this approach, all compounds are accounted for in the model with an objective to achieve good agreement with all analytical data and measured factory input and output quantities. Material balances are constantly refined when required. It must be noted that there is no statistical analysis performed to determine the "best fit", because of the extreme complexity of the material balance (the typical balance includes approximately 100 components) and the very high cost and time associated with the techniques required to analyze these streams.

In summary, there is no single approach that can be used to characterize batch emissions. These operations are diverse. Specific emission episodes may be both significant and insignificant. Physical property information may or may not be available. Pollution control may be in place to substantively mitigate or eliminate emissions. Detailed laboratory evaluations, conducted under carefully controlled conditions and utilizing more powerful laboratory techniques will yield emission factors of high quality which can be confirmed by monitoring a key process variables(s). Facilities that are reporting under this source category and for these types of operations need to be afforded the flexibility in selecting the most appropriate method, especially in light of EPA's desire to obtain the most accurate information.

Response: Please see the preamble of the final rule for a response to this comment.

Commenter Name: Jeff C. Muffat
Commenter Affiliation: 3M Center
Document Control Number: EPA-HQ-OAR-2009-0927-0111.1
Comment Excerpt Number: 29

Comment: Section 98.124 (c)(4)(i-iv) specifies gas flow measurement methods. Some batch process emissions will consist of gas streams that do not contain a significant amount of air. In addition, process emission vent piping systems are closed systems that are not easily adapted to these types of measurements. Inlet measurements to thermal oxidizers are typically measured with the types of mass flow meters that are commonly used in Subpart OO. The rule should allow flow rate data from these mass flow meters or other on-line flow measurement equipment.

Response: Please see the preamble of the final rule for a response to this comment.

Commenter Name: Jeff C. Muffat
Commenter Affiliation: 3M Center
Comment Number: EPA-HQ-OAR-2009-0927-0111.1
Comment Excerpt Number: 12

Comment: §98.123 (b)(3), Process-Vent-specific emission factor method. Many of these processes will involve batch emission episodes where the concentration and flow-rate may change over time. Therefore the values of C_{PV-ee} and QP_{V-ee} in equation L-14 are not constant. If not already EPA's intention, we would request that average C_{PV-ee} and Q_{PV-ee} values be used in the calculation. For example the values of C_{PV-ee} and Q_{PV-ee} could be measured at least three times during the batch and the average values used. If available, continuous measurements using FTIR and on-line mass flow meters could also be used to calculate the total mass of a GHG emitted during the batch. This method will not be possible for all batch processes and depends on the complexity of chemical composition of the process, the operating pressure and manufacturing equipment that is used.

Response: Please see the preamble of the final rule for a response to this comment.

Commenter Name: Jeff C. Muffat
Commenter Affiliation: 3M Center
Document Control Number: EPA-HQ-OAR-2009-0927-0111.1
Comment Excerpt Number: 14

Comment: §98.124 (c) Emission Factor Testing. In this section, EPA specifies the frequency and type of emissions testing that is required to create emissions factors. Specific comments for each paragraph in that section are provided below. 3M has conducted vent gas measurements on most of its continuous process vents. While this type of testing has not been conducted on most batch processes, we recognize EPA's desire to confirm engineering estimates with field testing for the highest emitting processes. We are prepared to conduct this work, but the regulation is overly specific with respect to the test accuracy and measurement frequency. We also believe that it is incorrect to rely exclusively on process vent testing in the development of the emission factors. Batch process vent measurements must be properly coupled with other techniques to cost-effectively produce the most accurate and reliable emission factors. In addition, we believe that engineering calculations and sound materials balances conducted under carefully controlled circumstances will result in the development of emission factors of equal or greater accuracy.

Response: Please see the preamble of the final rule for a response to this comment.

Commenter Name: Jeff C. Muffat
Commenter Affiliation: 3M Center
Document Control Number: EPA-HQ-OAR-2009-0927-0111.1
Comment Excerpt Number: 16

Comment: 3M has particular concerns with the batch process testing requirements and we are requesting that EPA refer to the language that is listed in §98.123 (b)(1) for all batch process vents. Our concerns are discussed in our response to §98.124(c)(3).

Response: Please see the preamble of the final rule for a response to this comment.

Commenter Name: John Dege
Commenter Affiliation: DuPont
Document Control Number: EPA-HQ-OAR-2009-0927-0103.1
Comment Excerpt Number: 26

Comment: Batch stack testing per §98.124(a) is typically imprecise, and costly. Engineering calculations should be allowed regardless of vent emission rate. EPA: Page 18677 of the preamble states " and for batch process vents, facilities would test during emissions episodes of the batch….another option is to require testing of vents for the full duration of the batch process, but this could significantly increase the expense of the emissions test without necessarily improving its accuracy." Comment: The concern about testing of batch processes is not when to do the test (i.e. do it when the process vent is open) or the test protocol (stack test protocol options are well established) but how to get a representative sample and representative flow rate. To get a representative emission rate using stack sampling, the vent rate and composition need to be relatively constant and/or predictable over the sampling period. This cannot be accomplished with many of our batch operations. At least two of our sites have batch unit operation vents that are closed for almost the entire batch. At selected moments during the batch, unneeded pressure is vented from the unit operation (i.e. the vapor space is vented down from some higher pressure to some lower pressure). The flow rate of vapor through the vent stack changes and the composition of the vented vapor changes as the pressure in the unit operation vapor space decreases over the period of venting. Depending on the process equipment, the vent step can occur within as little time as a few seconds or at most up to a few minutes. The issues that this creates for stack sampling are:

1. The vent period is too short to collect a meaningful sample or to collect the velocity profile data required by stack testing protocol.
2. The vent composition varies dramatically over the vent period.
3. The vent rate varies dramatically over the vent period.

For these reasons, we cannot obtain meaningful stack test emission data. There are EPA approved methods for calculating these emissions. We are already using these methods to calculate our air emissions for Title V. We propose that if these emissions need to be determined, using the calculation methods should be the approved approach to estimate the emissions. The recent Miscellaneous Organic NESHAP MACT recognizes these issues and only requires engineering calculations.

Response: Please see the preamble of the final rule for a response to this comment.

Commenter Name: Jeff C. Muffat
Commenter Affiliation: 3M Center
Comment Number: EPA-HQ-OAR-2009-0927-0111.1
Comment Excerpt Number: 3

Comment: 5. Source testing can be an extremely problematic for batch processes. A diverse toolbox of methods, traditionally referred to as “engineering estimates”, is needed in order to obtain the best possible information.

Response: Please see the preamble of the final rule for a response to this comment.

Commenter Name: Jeff C. Muffat
Commenter Affiliation: 3M Center
Comment Number: EPA-HQ-OAR-2009-0927-0111.1
Comment Excerpt Number: 24

Comment: §98.123 (b)(1), Preliminary estimate of emissions by process vent. 3M generally agrees with the calculation methods that are listed in this section. We believe that EPA should also limit the requirements for emission factors from batch processes or batch emission episodes of continuous processes to the methods that are listed in this section. The process vent testing methods that are listed in §98.124 (c)(4) should be listed as additional alternatives.

Response: Please see the preamble of the final rule for a response to this comment.

Section 4.3.5 – Scope of the Emission Factor

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 21

Comment: Arkema understands why EPA proposes to require reporters to document FGHG emissions from control device deviations and startup, shutdown, and malfunction (“SSM”) events. EPA should clarify that the §98.123(b)(1) calculation methods are appropriate to evaluate these emissions.

Response: As the commenter suggested, 98.124(j) has been revised to include a statement that calculation methods in §98.123(c)(1) may be used to estimate emissions startup, shutdown, or malfunction events.

Section 4.3.6 - Equipment Leaks

Section 4.3.6.1 – Alternative monitoring approaches for equipment leaks

Commenter Name: Jeff C. Muffat
Commenter Affiliation: 3M Center
Comment Number: EPA-HQ-OAR-2009-0927-0111.1
Comment Excerpt Number: 23

Comment: A variety of methods should be made available for determining equipment leak emissions. It is our belief that emissions from many of these sources are low and warrant this consideration. We are providing EPA with additional technical information to support this request.

Response: A response has been provided in section II.E.3, Fluorinated Gas Production (Subpart L), of the preamble to this rule.

Commenter Name: Jeff C. Muffat
Commenter Affiliation: 3M Center
Comment Number: EPA-HQ-OAR-2009-0927-0111.1
Comment Excerpt Number: 20b

Comment: Allow EPA approved alternative equipment leak emission estimation methods. 3M has utilized a number of methods in estimating equipment leak emissions from its processes. These include the methods that are described EPA-453/R-95-017 (Protocol for Equipment Leak Emission Estimates). 3M also uses system pressure and vacuum checks to meet LDAR requirements for many batch operations. These are described in 40 CFR 63.1036 (Alternative means of emission limitations: batch processes, (b) Pressure testing of batch equipment). For these components, we are not currently conducting the traditional Method 21 monitoring that is referenced in the rules. In some of these situations we have also used this information to estimate fugitive losses from these processes. In these cases the equipment leak loss from the process is calculated based on the pressure drop and system volume. Since the actual pressure drop will be less than the allowable loss during the pressure/vacuum check, this value will always be conservative. 3M would not elect to use this method under every circumstance. However it will be appropriate for a number of operations. This could be the case for low-GWP emissions or for flexible batch process equipment that is used to manufacture fluorinated-GHG's on a very limited basis. In the latter case process vent emissions will be very low, but an equipment leak estimate is required irrespective of those emissions or the time in service. For these operations the use of data derived from a system pressure check may be appropriate as emissions will be very low. Finally, as discussed in Attachment 2, there may be situations where an EPA 204 capture efficiency demonstration will be appropriate for a specific process or group of processes. A single test, conducted at a location which represents emissions from an entire process, may greatly simplify measurement requirements.

Response: A response has been provided in section II.E.3, Fluorinated Gas Production (Subpart L), of the preamble to this rule.

Commenter Name: Lorraine Krupa Gershman
Commenter Affiliation: American Chemistry Council
Comment Number: EPA-HQ-OAR-2009-0927-0092.1
Comment Excerpt Number: 21

Comment: In this proposal, EPA is requesting that the fluorochemical industry create a new fluorinated GHG equipment leak detection program. Unfortunately, due to the variability in the fluorochemistry industry, there is no one size fits all fluorinated GHG EL detection solution. Subpart L EL detection systems should provide enough flexibility to allow reporters to craft appropriate fugitive emission reporting systems. EPA should allow reporters to document appropriate EL detection practices for each affected facility in the GHG Monitoring Plan required in §98.3(g)(5).

Response: A response has been provided in section II.E.3, Fluorinated Gas Production (Subpart L), of the preamble to this rule.

Commenter Name: Jeff C. Muffat
Commenter Affiliation: 3M Center
Comment Number: EPA-HQ-OAR-2009-0927-0111.1
Comment Excerpt Number: 17

Comment: 98.124 (e) (3), Emission monitoring for pieces of equipment. The citation references bagging requirements followed by EPA Method 18 analytical procedures. We suggest that canister samples from the bags could be taken and could alternatively follow EPA TO-14a and TO-15. Should unknown compounds be present, or compounds for which certifiable standards do not exist, GC/MS can be used to identify them. When standards for the analyze are not available, a chemically similar surrogate may be used for quantification.

Response: A response has been provided in section II.E.3, Fluorinated Gas Production (Subpart L), of the preamble to this rule.

Commenter Name: Jeff C. Muffat
Commenter Affiliation: 3M Center
Comment Number: EPA-HQ-OAR-2009-0927-0111.1
Comment Excerpt Number: 20e

Comment: 3. EPA has recognized that unique instrumentation may be required to measure many of these constituents. For flexible batch processes, it is possible that testing conducted for the purpose of developing leak rate factors could be conducted when fluorinated-GHG's were not present in the system. During these periods non-F-GHG surrogates would be used to develop this information. The rule language should insure that this type of demonstration is allowed.

Response: A response has been provided in section II.E.3, Fluorinated Gas Production (Subpart L), of the preamble to this rule.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 31

Comment: At proposed §98.123(c), EPA removes the option of using the "Average Emission Factor Approach" (EPA, Protocol for Equipment Leak Emission Estimates, EPA-453/R-95-017 Table 2-1, 1995), even for components where traditional Method 21 monitoring is impossible. EPA should strike this prohibition.

Response: A response has been provided in section II.E.3, Fluorinated Gas Production (Subpart L), of the preamble to this rule.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 25

Comment: Many Subpart L reporting facilities currently conduct LDAR to comply with the Hazardous Organic NESHAP ("HON") at 40 CFR 63 Subparts F, G, H, and I or the Miscellaneous Organic NESHAP ("MON") at 40 CFR 63 Subpart FFFF (incorporating 40 CFR

63 Subpart H or UU LDAR provisions). The EPA MACT LDAR regulations contain several provisions that may be necessary for any prospective GHG LDAR program. As reporting facilities have not previously been required to conduct GHG LDAR, the industry will need to determine which FGHGs may be detected by which LDAR instruments. As we implement this program, we may learn that some FGHGs may not be detectable by existing LDAR equipment. The current proposal requires use of EPA Method 21 (40 CFR 60 Appendix A), which includes a gas chromatograph with a flame ionization detector. Method 21 requires that reporters demonstrate that the measured stream can be detected with a response factor of less than 10.

Response: A response has been provided in section II.E.3, Fluorinated Gas Production (Subpart L), of the preamble to this rule.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 26

Comment: Proposed §98.126(e) requires reporters to use methane as the Method 21 calibration gas. As methane may or may not be an appropriate calibration gas, based on the discussion above, EPA should strike the last sentence of this subpart. EPA should rely on the proposed §98.123(c)(1) provision that reporters maintain response factors below 10 to provide appropriate methods controls for FGHG LDAR emissions measurements. A forced calibration gas selection may conflict with the more appropriate response factor range requirement.

Response: A response has been provided in section II.E.3, Fluorinated Gas Production (Subpart L), of the preamble to this rule.

Commenter Name: Lorraine Krupa Gershman
Commenter Affiliation: American Chemistry Council
Comment Number: EPA-HQ-OAR-2009-0927-0092.1
Comment Excerpt Number: 30

Comment: Section §98.124(e) requires that EL monitoring instruments be calibrated using methane gas. However, ACC member companies may need to use instruments that do not meet the criteria of methane calibration gas and a response factor less than 10. EPA should rely on the existing Method 21 response factor criteria, and allow reporters to calibrate EL monitoring instruments with any appropriate calibration gas that provides proper response factors for targeted fluorinated GHGs.

Response: A response has been provided in section II.E.3, Fluorinated Gas Production (Subpart L), of the preamble to this rule.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 27

Comment: EPA does not provide any regulatory structure to address either alternate instrument selection nor appropriate monitoring surrogate selection. Today, facilities requiring an alternate instrument determination for a specific stream request authorization from EPA and/or the local permitting authority. As Part 98 is designed to memorialize these technical decisions in the GHG Monitoring Plan required at §98.3(g)(5), EPA should require reporters to document the choice of LDAR instruments in the Monitoring Plan. EPA should also adopt the 5% surrogate threshold, where a facility would, by process knowledge, document the identity of any surrogates in process streams that are monitored, and the appropriate Method 21 or alternate application to the identified components.

Response: A response has been provided in section II.E.3, Fluorinated Gas Production (Subpart L), of the preamble to this rule.

Commenter Name: Lorraine Krupa Gershman
Commenter Affiliation: American Chemistry Council
Comment Number: EPA-HQ-OAR-2009-0927-0092.1
Comment Excerpt Number: 24a

Comment: Some fluorochemical manufacturing units may be amenable to pressure LDAR testing at 40 CFR 63.1036. EPA should allow this LDAR alternate monitoring method in lieu of Method 21. In addition, EPA should not discourage the recent EPA alternate LDAR monitoring program at 40 CFR 63.11(c). While many fluorochemical manufacturers are not yet able to use this emerging technology, EPA should facilitate reporters adopting “smart LDAR” technology when it becomes available to the industry.

Response: A response has been provided in section II.E.3, Fluorinated Gas Production (Subpart L), of the preamble to this rule.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 29

Comment: We are exploring remote fugitive detection technology, but have not yet found a marketed system that can detect FGHGs. EPA should note in proposed §98.123(c) that a reporter may utilize any LDAR methodology and technology recognized by EPA, including EPA Method 21 remote sensing alternatives in 40 CFR 63.11(c), (d), and (e). EPA should also allow reporters to utilize any future LDAR technology final in or authorized by 40 CFR parts 60, 61, 63 and/or

65. EPA should require that reporters identify adjustments to the base FGHG LDAR program in their §98.3(g)(5) GHG monitoring plan.

Response: A response has been provided in section II.E.3, Fluorinated Gas Production (Subpart L), of the preamble to this rule.

Commenter Name: Thomas J. Scanlon
Commenter Affiliation: FLIR Systems, Inc.
Comment Number: EPA-HQ-OAR-2009-0927-105.1
Comment Excerpt Number: 3

Comment: Thus, FLIR Systems endorses the EPA suggestion[10] that optical gas imaging (OGI) and the alternative work practice (AWP) Method 21 be utilized to monitor leaks in Fluorinated Gas Production systems and specifically in SF_6 production. However, we see no reason why OGI for detection of leaks in SF_6 production systems should be less of a requirement than it is for methane and natural gas. This gas has a global warming potential over 22,000 times higher than CO_2 and over 1000 times greater than methane and natural gas[11]. FLIR Systems respectfully requests that EPA consider modifying certain provisions of the proposed Subpart I, L, DD, QQ, and SS rule to ensure that the full potential of this technology is exploited. We recommend that EPA:

- Require the use of OGI technology for monitoring gas leaks on all SF_6 gas production systems in the same way it will be required for natural gas production and transportation.

Optical Gas Imaging has been proven as a reliable in-field technology for detection of a wide variety of volatile organic compounds and SF_6. Detection of Fluorinated gases and HFCs, PFCs in particular uses the same basic technology approach and the same detector technology we deploy for the camera used to detect SF_6, but the market demand for these camera products has been minimal since there is no regulatory demand to detect these gases and leaks for these gases do not have the same safety and economic consequences inherent in large losses of methane or natural gas.

For this reason, we recommend that EPA:

- Move forward with the suggestion that AWP Method 21 protocol be utilized to monitor leaks in Fluorinated Gas Production systems.

Since the Method 21 protocol allows for either probe technology or optical imaging, producers will be encouraged but not required to use OGI.

Response: A response has been provided in section II.E.3, Fluorinated Gas Production (Subpart L), of the preamble to this rule.

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[10] Federal Register / Vol. 75, No. 69 / Monday, April 12, 2010 / Proposed Rules 18679.

[11] GWP values and lifetimes from 2007 IPCC AR4 p. 212.

Section 4.3.6.2 - Contribution of leaks to facility emissions

Commenter Name: Jeff C. Muffat
Commenter Affiliation: 3M Center
Comment Number: EPA-HQ-OAR-2009-0927-0111.1
Comment Excerpt Number: 20a

Comment: §98.123 (c), Calculate fluorinated GHG emissions for equipment leaks (EL). In conjunction with the process specific emission factors, 3M understands that it will be necessary to estimate leaks from equipment. As a part of preparing these comments, 3M conducted a sampling survey for one of its fluorinated-GHG production operations. A summary report is provided in Attachment 3. Various references are made to that document in the comments listed below. Due to time limitation we were not able to prepare a more comprehensive report. 3M will submit this information at EPA's request.

1. Emissions from equipment leaks will be very low. Leak Detection and Repair Programs (LDAR) are in place for most of 3M's chemical manufacturing operations. Leak rates, i.e. fraction of equipment where measurable concentrations have been detected, are typically extremely low. As reported in Attachment 1, one of our fluorinated-GHG manufacturing facilities conducts testing using 40 CFR Part 63 Subpart H. This particular process utilizes chemistry which has an acceptable Method 21 response factor (vinylidine fluoride). Over 4000 devices are monitored as a part of this testing. The annual average leak rate was less than 0.1%. A review was conducted of the data and for most of this equipment the measured values were equal to background concentrations. When applying the methods that are listed in EPA-453/R-95-017 (Protocol for Equipment Leak Emission Estimates) the "default zero leak rate factor" would be used for most of this information with the balance using the "screening value correlation". We believe that the resulting mass emission rates for the facility would be low.

At another facility, Method 21 testing has been conducted under Subpart UU for a facility that is subject to 40 CFR Part 63, Subpart JJJ. Testing is conducted at variable frequencies for over 1000 different pieces of equipment. During the last four years, there has been only one device (and on only one occasion) that exceeded the regulatory threshold. At one of its facilities, 3M conducted Method 21 screening to determine the impact of MACT requirements which regulate emissions of Hazardous Air Pollutants (HAP). 3M conducted screening on over 5000 flanges, valves, and other affected equipment. Of these, approximately 0.3% were determined to be "leaking" based on the 40 CFR 63 Subpart UU standards. The data that was collected at this facility was subsequently used to prepare estimates for air emission inventory reports and to comply to specific permit requirements for Hazardous Air Pollutants. For approximately 40% of the fittings, the "default zero leak rate" was utilized (no value detected above background). For the balance, a "screening value correlation" factor for measured concentrations of less than 1 ppmv above background, but less than the leak designation, e.g., 500 ppm for valves, was used. Emission rates for equipment were calculated with these factors and the sum of these values was less than 1% of the total site HAP emissions. In conclusion, while we agree that estimates may be a necessary part of the emission factor approach, EPA should be extremely flexible in the manner in which these estimates are made and the verification frequency for individual pieces of equipment.

2. Institutional controls are in place to prevent, detect, and remediate leaking equipment. The results of previous LDAR monitoring programs are not unexpected due to various controls that are in place at all of our chemical manufacturing facilities, including those that are used to manufacture and process fluorinated-GHG's. Equipment leakage rates at 3M facilities have typically been well below values described in the technical guidance documents that EPA has prepared as a part of various rulemaking efforts, e.g. NESHAP standards. 3M believes that other industries in this source category would have similar results. We believe the low leakage rates are the result of a number of factors:

a. OSHA mechanical integrity program which is intended to provide for the proper design and testing of all process vessels, piping, relief devices, emergency shutdown system, and control systems. This will include a schedule for the inspection and testing of system components.
b. Pressure and vacuum checks are conducted routinely at the start of manufacturing campaigns or when system components are replaced. Leaks that are detected during these checks will be repaired prior to start-up.
c. Ambient air quality monitoring for hydrofluoric acid is conducted in many of our fluorinated-GHG production processes. Leaks that occur from equipment components will be repaired when detected.
d. Value of product loss to fugitives.

These procedures, in addition to normal routine inspections of manufacturing areas, will ensure that the low measured leak rates are maintained. Testing frequencies should be extended for facilities that incorporate these practices.

Response: A response has been provided in section II.E.3, Fluorinated Gas Production (Subpart L), of the preamble to this rule.

Commenter Name: Jeff C. Muffat
Commenter Affiliation: 3M Center
Comment Number: EPA-HQ-OAR-2009-0927-0111.1
Comment Excerpt Number: 20c

Comment: In light of the very low emissions that are expected from these sources and the institutional controls that are in place to maintain this level of performance, 3M would have the following recommendations:

1. The rule should provide for a wide range of estimation methods that can be customized to site operations. For example, the use of FTIR instrumentation is effective but an expensive and resource intensive approach, especially if testing was required at the one year frequency specified in the rule. However, the method could be used to "survey" a representative sample of equipment at a facility and leak factors could be applied facility-wide. These surveys could be

married with system pressure checks and the results of a Method 204 capture efficiency demonstration could also be applied facility wide.

Response: A response has been provided in section II.E.3, Fluorinated Gas Production (Subpart L), of the preamble to this rule.

Commenter Name: John Dege
Commenter Affiliation: DuPont
Comment Number: EPA-HQ-OAR-2009-0927-0103.1
Comment Excerpt Number: 20

Comment: Equipment leak monitoring is expensive, emissions are de minimis and should not be required for emission estimating purposes. EPA: Section 98.123(c) states: "If you comply with paragraph (b) of this section, you must calculate the fluorinated GHG emissions from pieces of equipment associated with processes covered under this subpart and in fluorinated GHG service." Comment: The costs associated with equipment leak monitoring are not justified based on DuPont's experience using Method 21 for VOC leaks at our chemical plants. In addition, Method 21 is inappropriate for some non-VOC fluorochemicals. (see Appendix B) For example, at one of our sites (that is typical of our company experience) the total VOC emissions for 10 production units for 2008 & 2009 was 1154 lbs. This resulted from LDAR inspections for approximately 2000 valves, 6000 connectors and 50 pumps. The overall leak rate in 2008 was connectors, 0.029%; valves, 0.45%; pumps 0% (no leakers). The emissions are insignificant and de minimis compared to total production. If EPA insists on an equipment leak program, then it should be infrequent, i.e. up to 5 year intervals, based on leak frequency.

Response: A response has been provided in section II.E.3, Fluorinated Gas Production (Subpart L), of the preamble to this rule. For a response to the comment regarding monitoring frequency, please see the response to comment number EPA-HQ-OAR-2009-0927-0103.1, excerpt number 18.

Section 4.3.6.3 – Exemptions and Exclusions from Monitoring

Commenter Name: John Dege
Commenter Affiliation: DuPont
Comment Number: EPA-HQ-OAR-2009-0927-0103.1
Comment Excerpt Number: 20

Comment: All regulations that require equipment leak monitoring have a definition or threshold for the pollutant concentration in the pipe that is being monitored. Most rules use 5 wt% as the threshold for requiring monitoring, since emissions are trivial from components with low pollutant concentrations. Some rules use 10 wt %. Subpart L regulation does not specify a minimum threshold and thus any LDAR component with merely a trace concentration of an FGHG must be measured using Method 21. Method 21 instruments are not very sensitive to most FGHG compounds and, as a result, have excessively high response factors well above those allowed by Method 21. This means that monitoring components with low concentrations of FGHGs will not detect these compounds and thus will only provide meaningless data and no environmental benefit. DuPont recommends that Subpart L as well as Subpart O contain a more definitive definition of “In FGHG service” and strongly recommend 5 wt% as the definitive threshold for “in FGHG service.” Consistent with MACT standards (i.e., 40CFR 63 subpart H (40CFR 63.161), only light liquids should require monitoring.

Response: We agree with the commenter that the equipment leak monitoring requirements should include several of the standard exemptions that are typical in other regulatory programs. It is reasonable to exempt streams with low fluorinated GHG concentrations because this exemption focuses resources on those pieces of equipment that are likely to emit fluorinated GHGs. The definition of “In fluorinated GHG service” has been revised to include those pieces of equipment that contain or contact a liquid or gas that contains at least 5 percent by weight fluorinated GHG.

In revising the equipment leak monitoring requirements to allow multiple alternative monitoring and emission estimation techniques, we also reviewed the requirements in other regulatory programs and incorporated typical monitoring exclusions and exemptions. The commenter also noted that only those pieces of equipment in light liquid service should require monitoring. We have revised the rule to include monitoring only for those pieces of equipment in light liquid service and those in gas and vapor service, if the facility monitors individual pieces of equipment rather than relying on room air monitoring approaches or default emission factors.. An exclusion from monitoring pieces of equipment in heavy liquid service has been incorporated into the final rule; however, facilities must estimate emissions from pieces of equipment in heavy liquid service using another approach (e.g., application of default emission factors). In previous rule-making efforts, EPA excluded pumps, valves, connectors, and agitators in heavy liquid service from routine monitoring on the basis that they contribute only a very small portion of overall emissions from a process unit (see 57 FR 62680; December 31, 1992). For this reason, we have excluded the heavy liquid service from monitoring requirements.

Several other types of equipment are also excluded from requirements to perform individual leak monitoring because they have special features that limit emissions from leaks. However, as is the case for equipment in heavy liquid service, the facility must still estimate emissions from these types of equipment using another approach. The following types of equipment are excluded: (1) pumps and agitators that have dual mechanical seals; (2) pumps and agitators with no external shaft, (3) pressure relief devices in gas and vapor service that have upstream rupture disks, (4) sampling connection systems with closed-loop systems or closed-purge systems, and (5) any pieces of equipment where the leaks are routed to a closed-vent system to a control device or destruction device. Equipment with dual mechanical seals is less likely to leak since it has two seals rather than one, and pumps and agitators with no external shaft will not be able to leak through a shaft opening. For pressure relief devices with an upstream rupture disk, visual inspection can detect a ruptured disk, which can be replaced, or can confirm the presence of an unruptured disk. Sampling connection systems have been excluded from monitoring requirements because they typically have closed-loop system or closed-purge system, so no purge material would be released (we would like to note that the valves and any open-ended line in the sampling loop would be subject to monitoring or other emission estimate methods). The final rule also excludes from monitoring any pieces of equipment where the leaks are routed to a closed-vent system to a control device or destruction device because these leaks are not subject to monitoring in other rules, and the control is expected to reduce actual emissions to low levels. Again, facilities must estimate emissions from these types of equipment using another approach. This approach may incorporate leak events, repair, or replacement events for these pieces of equipment that may occur over the year.

EPA has allowed use of the default Average Emission Factor approach from EPA's Protocol for Equipment Leak Emission Estimates, EPA-453/R-95-017 (EL Protocol) in the final rule, but we noted that there is no average emission factor available for instrumentation systems or for pressure relief devices in liquid service. We have therefore exempted these equipment types from the equipment leak requirements. In previous rule-making efforts, EPA determined that instrumentation systems consist of small diameter tubing and equipment in confined areas that are not easily monitored, that instrumentation systems are subject to frequent surveillance and maintenance so any leaks are readily detected and promptly repaired, and that the integrity of instrumentation systems is checked after repair or maintenance. Therefore, the total mass of emissions from instrumentation system leaks is expected to be small (see 57 FR 62680; December 31, 1992). Pressure relief device in light liquid service or heavy liquid service were also determined to contribute only a very small portion of overall emissions.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 25

Comment: Current LDAR regulations also specify that facilities must monitor components in service not less than 300 hours per year and containing not less than 5% of the regulated constituent. EPA should add these provisions, or directly adopt the entirety of 40 CFR 63 Subpart H or UU as an appropriate compliance option.

Response: We agree that an exemption for pieces of equipment in service less than 300 hours per year is appropriate and is consistent with exemptions in other regulatory programs. The final rule includes an exemption from monitoring for pieces of equipment in service less than 300 hours per year.

For a discussion of the concentration that defines equipment as being "in fluorinated GHG service, please see the response to comment number EPA-HQ-OAR-2009-0927-0103.1, excerpt 20.

Commenter Name: Lorraine Krupa Gershman
Commenter Affiliation: American Chemistry Council
Comment Number: EPA-HQ-OAR-2009-0927-0092.1
Comment Excerpt Number: 23

Comment: We recommend that this subpart, as well as subpart O, contain a more definitive definition of "in fluorinated GHG service" and strongly recommend that 5% by weight be the definitive threshold for "in fluorinated GHG service." Consistent with NESHAP standards, only light liquids and actual gasses should require monitoring.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0103.1, excerpt 20.

Commenter Name: Lorraine Krupa Gershman
Commenter Affiliation: American Chemistry Council
Comment Number: EPA-HQ-OAR-2009-0927-0092.1
Comment Excerpt Number: 22

Comment: As written, this section does not specify a minimum threshold for measuring EL from fluorinated GHG emissions, and therefore requires that any component with a trace concentration of a fluorinated GHG must be measured using Method 21. Method 21 instruments are not very sensitive to most fluorinated GHG compounds and, as a result, have excessively high response factors well above those allowed by Method 21. This means that monitoring components with low concentrations of fluorinated GHGs will not detect these compounds, resulting in no reportable emissions and thus no environmental benefit.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0103.1, excerpt 20.

Commenter Name: John Dege
Commenter Affiliation: DuPont
Comment Number: EPA-HQ-OAR-2009-0927-0103.1
Comment Excerpt Number: 19

Comment: The Subpart L Equipment Leak Monitoring provisions are missing key provisions typically found in LDAR programs. EPA: Section 98.123(c) states: "If you comply with paragraph (b) of this section, you must calculate the fluorinated GHG emissions from pieces of equipment associated with processes covered under this subpart and in fluorinated GHG service." Comment: The Subpart L Equipment Leak Monitoring provisions do not include provisions and exclusions for unsafe to monitor locations, insulated equipment, and equipment in vacuum service. These provisions are applicable to Subpart L Equipment Leak Monitoring, and should be incorporated. They are not referenced in Method 21. EPA can refer to the SOCMI MACT LDAR regulations; for example provisions (40CFR 63 subpart H).

Response: We agree that an exclusion from monitoring for pieces of equipment that are difficult-to-monitor, unsafe-to-monitor, or insulated is appropriate and is consistent with other regulatory programs. The final rule includes an exclusion from monitoring for pieces of equipment that are difficult-to-monitor, unsafe-to-monitor, or insulated; however, facilities must estimate emissions from these pieces of equipment using another approach.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 30

Comment: EPA does not include provisions for reporters to manage components that are not easily monitored or cannot be monitored at all using current techniques in this proposal. Existing LDAR provisions concepts include "difficult to monitor" and "unsafe to monitor" to manage components that are installed more than two meters above a working surface or cannot be reached safely during operations due to operational hazards. Arkema operates a FGHG-containing manufacturing process that operates at high pressures (hundreds of pounds per square inch) where no employee, contractor, or visitor may enter the operating area during production. Compliance with an instrument LDAR program during FGHG operations in high pressure service units would violate Occupational Safety and Health Administration ("OSHA") process safety management ("PSM") regulations at 29 CFR 1910.119. Alternate LDAR monitoring protocols, including no monitoring, should be available to reporters.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0103.1, excerpt 19.

Commenter Name: Lorraine Krupa Gershman
Commenter Affiliation: American Chemistry Council
Comment Number: EPA-HQ-OAR-2009-0927-0092.1

Comment Excerpt Number: 24b

Comment: This section should also define "difficult to monitor" and "unsafe to monitor" to provide reporters with relief from monitoring components that would not be monitored in existing LDAR programs. For example, 40 CFR 63.1022(c) provides a procedure where reporters may show that components are inaccessible, due to height from a working surface or location behind a blast wall. Many fluorochemical manufacturing units operate under substantial pressure, where personnel are not permitted to enter the process unit during unit operations. In some cases, the only viable method to calculate fluorinated GHG emissions from some safety-restricted process units is to utilize the "average" factors from the 1995 EPA LDAR guidance document. We have provided additional technical comments on this section in the attached Appendix B.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0103.1, excerpt 19.

Commenter Name: Dave Stirpe
Commenter Affiliation: Alliance for Responsible Atmospheric Policy

Comment Number: EPA-HQ-OAR-2009-0927-0117.1
Comment Excerpt Number: 12

Comment: The Alliance is concerned about the limited options provided in the Proposed Rule, including the lack of any difficult-to-monitor or unsafe-to-monitor provisions and the lack of pressure leak checking protocols in the Leak Detection and Repair (LDAR) reporting proposal.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0103.1, excerpt 19.

Commenter Name: Jeff C. Muffat
Commenter Affiliation: 3M Center
Comment Number: EPA-HQ-OAR-2009-0927-0111.1
Comment Excerpt Number: 20d

Comment: 2. We would request that any requirement for equipment leaks be properly aligned with the regulatory thresholds for source category testing. Equipment leak testing should not be required for processes with vent emissions that are below the one (1) ton/yr threshold.

Response: We have not included a mass-based threshold for equipment leak testing. Equipment leak monitoring requirements under other regulatory programs typically include a concentration-based threshold that is applicable to individual streams rather than exempting an entire process. We have included a concentration-based threshold in the final rule.

Please see the response to comment number EPA-HQ-OAR-2009-0927-0103.1, excerpt 20.

Section 4.3.6.4 – Frequency of Equipment Leak Monitoring

Commenter Name: John Dege
Commenter Affiliation: DuPont
Comment Number: EPA-HQ-OAR-2009-0927-0103.1
Comment Excerpt Number: 18

Comment: Equipment Leak monitoring frequencies in §98.123(c) are not stated in the rule. EPA: Pages 18676-18677 and 18679 of the preamble state that equipment leaks will be monitored annually using Method 21. Comment: The monitoring frequency is not stated in the rule. Method 21 does not specify a frequency. Few FGHG processes currently monitor flanges since few FGHGs are HAPs, and VOC LDAR requirements generally do not require it. Hazardous Air Pollutant monitoring requirements are generally on a 2 year frequency for flanges. An annual requirement to monitor equipment exceeds VOC and HAP requirements, and is excessively costly and burdensome. A more appropriate requirement would be to set the leak frequency on performance, but keep the frequencies common to reduce complexity for instance: >1 % – testing every year; >0.5% but <2 % - testing every 3 years; <0.5% - testing every 5 years. Since this monitoring pertains to emissions estimations – statistically based sampling of "sublots” of equipment leak points is a valid, more cost effective means of emissions determination. Please refer to Appendix B for more detailed comments on sub-lot sampling.

Response: We have clarified in the final rule that, for facilities that conduct equipment leak monitoring, the monitoring must be conducted annually, but that it may be conducted on a representative subset of the process equipment each year. Specifically, the rule requires that a representative one-third of the pieces of equipment be monitored each year so that at the end of 3 years, all pieces of equipment have been monitored. If the facility has multiple processes that have similar types of equipment in similar service, and that produce or transform similar fluorinated GHGs (in terms of chemical composition, molecular weight, and vapor pressure) at similar pressures and concentrations, then the facility may annually sample all of the equipment in one third of these processes rather than one third of the equipment in each process. The data from these representative equipment pieces may be extrapolated to the remaining equipment to estimate annual emissions for equipment leaks. While monitoring frequencies vary across LDAR programs based on the type of equipment and the site-specific leak rates, the annual monitoring requirement, with one-third of equipment pieces monitored each year, for subpart L is relatively consistent with the frequencies required in other programs.

Commenter Name: Lorraine Krupa Gershman
Commenter Affiliation: American Chemistry Council
Comment Number: EPA-HQ-OAR-2009-0927-0092.1
Comment Excerpt Number: 22

Comment: Pages 18676-18677 and 18679 of the preamble state that equipment leaks would be monitored annually using Method 21. This frequency requirement is not stated in the rule and Method 21 does not specify a frequency. Few fluorinated GHG processes currently monitor flanges since few fluorinated GHGs are hazardous air pollutants (HAPs), and VOC leak detection and repair (LDAR) requirements generally do not require it. HAP monitoring requirements are generally on a 2 year frequency for flanges. An annual requirement to monitor equipment exceeds VOC and HAP requirements, and is excessively costly and burdensome. We recommend that the requirement be biennial monitoring of equipment leaks, excluding those from non-rotating equipment such as flanges, using a procedure that is detailed in a facility’s GHG Monitoring Plan.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0103.1, excerpt 18.

Section 4.3.6.5 - Other

Commenter Name: John Dege
Commenter Affiliation: DuPont
Comment Number: EPA-HQ-OAR-2009-0927-0103.1
Comment Excerpt Number: 21

Comment: DuPont supports EPA's distinction between "Equipment Leaks (EL)" and "Leak Detection and Repair (LDAR)" since the "repair" portion of the common acronym is not in scope. EPA: EPA is proposing that monitoring of process vents be supplemented by monitoring of equipment leaks…" Comment: DuPont supports EPA's proposal to exclude the repair portion of LDAR in the equipment monitoring provisions.

Response: We appreciate the commenter's support and agree that since this is a reporting rule, a focus on monitoring for the purposes of "leak detection" for estimating emissions is necessary. Requirements related to the "and repair" portion of LDAR have not that been included as full LDAR requirements would be considered a control requirement.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 54

Comment: In proposed §98.127(f), EPA details the records associated with equipment leaks for which affected facilities are required to maintain. EPA only proposed to require reporters to maintain records associated with equipment leaks (i.e., number, type, service of components; process stream composition; screening data). Subpart L does not require reporters to maintain repair records for leaking equipment. Fugitive emissions records without repair records only provides a limited view of actual emissions. Proper actual emissions calculations require repair records to allow reporters to use the post-repair LDAR measurements to calculate point-forward actual emissions. EPA should require a consistent view of LDAR related FGHG emission rates.

Response: We have not included an explicit requirement to keep records of leak repairs in subpart L. The final requirements allow multiple approaches for equipment leak emission estimation, and some of these may not assign lower leak rates to equipment following a repair. However, §98.3(g)(2) requires that facilities keep records of "the data used to calculate the GHG emissions for each unit, operation, process, and activity, categorized by fuel or material type." These data include, at §98.3(g)(2) (i), "the GHG emissions calculations and methods used." Under this provision, facilities that assign a lower leak rate to equipment following a repair will be required to keep records of the repair to document the change in the rate.

Section 4.4 - Allow Combination of Mass Balance, Process Vent testing and Engineering Calculations

Commenter Name: Brian R. Keck
Commenter Affiliation: Air Products and Chemicals, Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0106.1
Comment Excerpt Number: 1

Comment: The following comments on EPA's proposed Subpart L of the GHG Mandatory Reporting Rule (MRR) provide a more detailed description of our support and concern for many of the issues involved with the calculation, measurement and reporting of fluorinated greenhouse gases. We are concerned that Subpart L is still very prescriptive as re-proposed, and prescribed calculation and monitoring methods remove the ability for sources to develop new protocols that better calculate the emissions from our facilities. Affected sources should be allowed to develop site-specific protocols for emissions estimating, measuring and monitoring, and detail such protocols in the required GHG Monitoring Plan.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0111.1, excerpt 1.

Commenter Name: Brian R. Keck
Commenter Affiliation: Air Products and Chemicals, Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0106.1
Comment Excerpt Number: 22

Comment: In Section B.7 of the Technical Support Document (TSD), EPA notes that some facilities use a form of the mass balance approach in conjunction with an emissions factor based approach to track yields and changes in the process, as well as to calculate emissions. Air Products recommends that this “combined mass balance emission factor” approach be an emissions estimation method that a facility could propose for EPA’s consideration and approval in lieu of the current mass balance, process-vent-specific emission factor or process-vent-specific emission calculation factor approaches.

Response: The commenter suggests here that perhaps a “combined” mass balance and emissions factor approach could be used for estimating emissions. We have not included such an approach in the final rule as it is not clear how such an approach could be constructed. The risk of a combined approach would be that it would either overlook or double-count some emissions. We would like to clarify, however, that each separate “process” may use either a mass balance or an emission factor approach. For example, the production of each isolated intermediate is defined as a separate process; thus, a facility may use the mass balance approach for one isolated intermediate (process), and then use an emission factor approach for the next isolated intermediate (process). We would also like to note that even within a process, there may be situations in which, if the process itself can be broken apart, by unit operation for example, with clean separation between the two, a mass balance approach could be used for the first unit operation and an emission factor could be used for the second unit operation, or vice versa. A so-called “combined” approach, however, that is part mass balance and part emission factor would not be allowed.

Commenter Name: Craig Holt Segall
Commenter Affiliation: Sierra Club
Comment Number: EPA-HQ-OAR-2009-0927-0128.1
Comment Excerpt Number: 16

Comment: EPA should also consider ways to meld these approaches. Process vent measurements can serve as a useful way of checking mass-balance emissions estimates. As the TSD describes, "[f]acilities that use a form of the mass balance approach indicated that it is often used in conjunction with an emissions factor based approach, to track yields and subtle or incremental changes in the process."[12] It may be possible to combine these processes here, perhaps by requiring facilities using the mass balance approach to check their results using process vent measurements every five years.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0106.1, excerpt 22. In addition, please note that in the final rule, facilities using the mass balance approach are required to characterize emissions from process vents by either (1) assuming that all emissions of fluorine occur in the form of the fluorinated GHG that has the highest GWP among the fluorinated GHGs that occur in more than trace concentrations in the process, or (2) using previous or new emission measurements to assign missing mass to reactant, by-product, and/or product emissions, as appropriate. For larger processes with emissions equal to or greater than 25,000 mt CO_2e, facilities would be required to conduct measurements for certain large process vents, use existing measurements for other process vents, and make assumptions about fugitive emissions based on the contents of vented emissions.

Section 4.5 - Other

Commenter Name: G. Auth
Commenter Affiliation: MIDAC Corporation
Comment Number: EPA-HQ-OAR-2009-0927-0074.1
Comment Excerpt Number: 1

Comment: Executive Summary. Fourier transform infrared spectroscopy (FTIR) as used in continuous emission monitoring (CEM) is a well-established and mature technology. FTIR CEM is currently used both in the electronics industry and in the F-gas manufacturing industry. The hardware and software are readily configurable to a range of applications, and the sampling equipment is sufficiently resistant to the corrosive components expected in these process gas streams (e.g. HF, F_2) that they operate for months at a time with little or no evidence of damage. Several applications are described where FTIR CEM can be utilized at various locations within the facility to cost-effectively monitor GHG gases as required.

FTIR spectroscopy is used for both qualitative and quantitative analysis of a wide variety of compounds. FTIR spectroscopy has been in use for over 40 years and is a well-established technique, common in labs, academia, and industry worldwide. The use of FTIR as a continuous emission monitor is likewise well-established and widely used – 40 CFR Part 60, Appendix B, Performance Specification 15 - Performance Specification for Extractive FTIR Continuous Emissions Monitor Systems in Stationary Sources. This technology is very mature and can be readily used in CEM applications for the electronics and F-gas manufacturing sectors.

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[12] Fluorinated Gas TSD at 22.

FTIR for Component Analysis. The gases described in the EPA Proposed Rule (CF_4, C_2F_6, C_3F_8, c-C_4F_8, c-C_4F_8O, C_4F_6, C_5F_8, CHF_3, CH_2F_2, NF_3, SF_6 (F-GHGs) and N_2O) all have unique infrared spectra and can be readily distinguished in the presence of the others with high resolution FTIR spectrometers (1.0 - 0.5 cm^{-1}). The instrumental and data collection parameters spelled out in the 2006 ISMI Guideline for Environmental Characterization of Semiconductor Process Equipment are generally adequate to measure these compounds in an FTIR CEM application. Similarly, byproducts of F-gas decomposition or reaction as might be observed in these industries (e.g. COF_2, OF_2, SO_2, SOF_2, SO_2F_2, etc.) are also readily distinguished. A single infrared spectrum can be analyzed for any combination of these component gases. As an FTIR collects the entire infrared spectrum simultaneously, the identities and concentrations of these compounds can also be determined simultaneously. Note that this is not the case with nondispersive infrared spectroscopy (NDIR). An FTIR collects the entire spectrum, and the compounds of interest are quantified immediately. This process can be repeated continuously and indefinitely (months or years), limited only by equipment failure or data storage capacity.

Another example of FTIR as a CEM is in monitoring for products and byproducts in a large F-GHG manufacturing facility in the US Midwest. At this installation, there are 5 separate FTIR spectrometers monitoring separate processes in a continuous manner for months at a time. These spectrometers operate with compounds in the percent concentration range, so the sample cells are much shorter; 1 cm, 5 cm or 10 cm long as needed by the specific process. This application observes starting materials and products as well as corrosive byproducts such as HF. The sample cell is the only component that contacts the corrosive environment, so corrosion-resistant componentry is only required for a small portion of the equipment. This can be a sample cell comprised of PTFE, solid nickel, nickel coated aluminum, or 316 stainless steel, capped with zinc selenide (ZnSe) windows. In the case of a long-path gas cell, the hardware would include ZnSe, germanium, or diamond windows and gold-coated or polished nickel mirrors. These components are readily available and are not harmed by harsh environments such as these. The FTIRs and gas cells utilized at this installation are examined and cleaned on a quarterly basis with no evidence of corrosive attack or damage. The concern noted on page 122 of the Preamble is unfounded when the correct hardware is specified, as based on MIDAC Corporation's experience with such applications. This equipment will even withstand Cl_2, HBr, and F_2 as observed in silicon etch and NF_3-based chamber clean processes.

Pre-POU Scrubber CEM. The sample line extracts gases for analysis immediately after the process vacuum pump but before the POU abatement scrubber. This configuration would require a short-path gas cell (1 – 10 cm) as the target gases will likely be in the 0.1% (10,000 ppm) range or greater. A high-speed Sterling-cooled mercury-cadmium-telluride (MCT) detector is recommended as the process composition changes quickly and data points should be no more than 3-5 seconds apart. In this case, a single sample line would be monitored for a predetermined period (e.g. a couple of minutes) so the entire wafer can be analyzed before moving on to the next sample chamber. This configuration is useful for fingerprinting emissions from a representative process (e.g. dielectric etch or chemical vapor deposition) to determine emissions factors according to the ISMI Sematech Protocol. This configuration is too equipment-intensive for every process chamber as there may be a thousand process chambers in a large fab. An FTIR CEM for each process chamber is not economically feasible for an entire manufacturing facility. However, one or two sample lines may be used on representative chambers (e.g. silicon etch, dielectric etch, nitride etch, then deposition) to fingerprint specific processes. In addition, this configuration may be used by a process tool manufacturer for determining emissions factors. This configuration may also be considered for an F-gas manufacturer (Subpart L) in determining byproducts and stoichiometric factors from the manufacturing process.

Duct or Sub-main CEM. In this configuration, samples are taken from specific locations in sub-mains where GHGs may be expected, such as an oxide etch bay, or in an extracted area around an F-gas manufacturing vessel or valve system (monitoring for leaks). In these ducts, the target gases will be more dilute as other equipment, such as gas cabinets, may also be feeding into these lines. In such cases, a longer path gas cell (e.g., 20 meters) is indicated, along with an MCT detector. Under such conditions, detection limits to the single ppb levels may be achieved for most fluorinated gases. This configuration would also require dilution spiking capability using CF_4 , SF_6 , or ethylene[13] , or a QMS and a tank of Kr with an MFC at some location upstream of the sample point. The CEM software can be configured to open and close a valve on a pre-determined schedule to allow the spiking gas into the duct for real-time dilution analysis. This configuration would be used to maintain a record of emissions by sub-main which can be integrated and reported in kg CO_2E/year or other desired units.

Stack CEM. In this configuration the samples are taken from the exhaust stacks on the roof, such as at the exit of a thermal oxidizer or rooftop scrubber. The concentrations of the FC gases will be very low at this point, and the ability to reliably see concentrations in the low ppb levels is imperative. This configuration would utilize a 20- or 60-meter gas cell and an MCT detector. Heated lines and gas cell are also required. These components would maximize the absorbance of the fluorocarbon while allowing for many coadded scans to enhance the signal-to-noise ratio, both of which may be required for very low concentrations. One ppb of CF_4 from a 100,000 cfm stack will contribute 22 kg CO_2 eq/day, so sensitivity is paramount in this application. This will be the most challenging of the described applications due to the very low concentrations of gases expected at the stack.

Expenditures. The cost of an FTIR CEM system is very dependent on the number of data collection points and other aspects of the configuration (pathlength of gas cell, type of detector, room-temperature or heated gas cell, etc.). The price of a fully-outfitted FTIR CEM system can be comparable to (or less than) what a large fab might spend in a year for on-site testing by a third-party analyst. The proposed 20% of the fab's POU scrubbers could be sampled for the first year at this initial CapEx and installation price, then the sample lines can be moved to different scrubbers the second year at minimal cost to the fab, and so forth.

Summary. FTIR for continuous emission monitoring of a wide range of industrial processes is a mature and well-established technology. The dilution levels and corrosive nature of the gases used in the semiconductor and related industries are well within the capabilities of FTIR CEM to measure reliably for extended periods. FTIR is suitably configurable that an FTIR CEM can be

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[13] Ethylene (CH2=CH2) is an inexpensive hydrocarbon gas of minimal toxic hazard (simple asphyxiant). It is used extensively in the FTIR community as a calibration transfer standard or tracer. Ethylene has a very sharp and distinct peak at 950 cm^{-1} and is commonly used as a spiking gas in the FTIR industry. Though the primary ethylene Q-branch band may observe some interference from SF_6 (945-948 cm^{-1}), ethylene has other bands away from common FCs and other interferents that can also be used for quantification.

cost-effectively utilized in a wide range of semiconductor- and F-gas related applications, though as with any technology, there are limitations. FTIR CEM is a suitable technology for analysis of GHGs from both the electronics (SubPart I) and F-gas manufacturing (SubPart L) industries.

Response: Based on the comment letter, we are aware of one fluorinated gas facility that has CEMS installed. Although some technologies (e.g., FTIR) may permit continuous monitoring of fluorinated GHG emissions, we do not have sufficient information on the cost of outfitting a facility with this technology to meet the objectives of the reporting rule to require them at this time. We will continue to evaluate the possible use of CEMS at these facilities in the future.

EPA appreciates the useful information provided on FTIR CEMS for the fluorinated gas production industry. The commenter cited examples of FTIR CEMS installations, showing that the monitoring systems are available and applicable for certain applications. The commenter cited one fluorinated gas production facility that is monitoring 5 streams. As other commenters state, many facilities in the fluorinated gas source category do not have CEMS installed on their process vents. The commenter noted a number of technical features and issues, noting that units can be made of corrosion-resistant materials for corrosive environments, that concentrations of varying magnitudes can be addressed with path length selection (e.g., approximately 1 cm to 60 meters with path length increasing with decreasing fluorinated gas concentrations), and use of sophisticated detector cooling approaches may address the analysis speed. The fluorinated gas production source category is a diverse and complicated industry, with many different types of processes and emissions. We are certainly aware that HF concentrations vary significantly from facility to facility depending on the process, and what might be technically feasible at one facility may not be feasible at another. (One facility has noted in conversations with EPA that they attempted to use an FTIR CEMS in the past without success.) Industry has noted concerns with monitoring of hazardous streams.

Prior to requiring CEMS, additional information is needed to determine the costs for an FTIR CEMS, particularly for CEMS that could address the very corrosive environments and complexity (including the number of sample locations) that would be required for many facilities and processes in this source category. These costs would need to be considered in conjunction with the expected increase in the accuracy and precision of the emissions estimates and the goals of this reporting rule.

Commenter Name: Craig Holt Segall
Commenter Affiliation: Sierra Club
Comment Number: EPA-HQ-OAR-2009-0927-0128.1
Comment Excerpt Number: 18

Comment: We recognize that many facilities do not have continuous emissions monitoring systems (“CEMS”) installed, and that acidic gases may make it difficult to use such systems without scrubbers. Nonetheless, CEMS, as EPA acknowledges, “would be expected to provide estimates of emissions more accurate than either the mass-balance or process-vent approach.”[14]

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[14] 75 Fed. Reg. at 18,679.

EPA should employ these methods for the largest facilities and emissions streams. The agency proposes requiring CEMS for streams resulting in the emission of more than 50,000 $mtCO_2e$ annually. We strongly support this proposal. These individual streams have climate-forcing effects as large as that from entire factories in some instances, and should be closely monitored using the best technology available.

Response: Please see the responses to comment number EPA-HQ-OAR-2009-0927-0074.1, excerpt 1.

Commenter Name: Craig Holt Segall
Commenter Affiliation: Sierra Club
Comment Number: EPA-HQ-OAR-2009-0927-0128.1
Comment Excerpt Number: 14

Comment: EPA allows facilities to select either a mass-balance or emissions factor-based monitoring approach.[15] As we discuss below, continuous emissions monitoring would be the better choice, at least for large sources. But if EPA instead uses these approaches, it should improve their implementation.

Response: Please see the responses to comment number comment number EPA-HQ-OAR-2009-0927-0128.1, excerpt 15, and comment number EPA-HQ-OAR-2009-0927-0128.1, excerpt 17.

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[15] See Prop. 40 C.F.R. § 98.123

Section 5 - Monitoring and QA/QC Requirements

Section 5.1 - Initial Scoping Test

Commenter Name: Jeff C. Muffat
Commenter Affiliation: 3M Center
Comment Number: EPA-HQ-OAR-2009-0927-0111.1
Comment Excerpt Number: 13

Comment: §98.124 (a), Initial scoping test for fluorinated GHGs. 3M believes that the initial scoping test for fluorinated GHG's that is described in §98.124 (a) may be unnecessarily prescriptive with respect to requiring gas testing for all streams. In addition we are also providing comment on the analytical costs and technical feasibility of identifying all chemicals that may be present at concentrations of greater than 0.1%. We believe that this requirement can be modified to allow greater flexibility in the manner in which these assessments are made. In addition, if EPA chooses to maintain this requirement, the thresholds that require such an analysis should be aligned with the emission thresholds that are listed in the rule. Finally, 3M is also providing comment on the referenced test methods in this section.

There are many methods that may be used to determine the composition of a gas stream. They would include process and product knowledge, testing conducted at other locations, historical testing, and in many cases, combinations of all of these methods. There are many examples where process and product knowledge would preclude the need for vent gas testing. Emissions that may occur during head space displacement or the final filtration of a product are examples where sufficient product knowledge is available and no additional testing would be required. In these cases, an analysis of the process fluid will provide sufficient information to characterize the materials that will be present in process emissions. In some cases, knowledge of process chemistry, even when reactions occur, will be adequate to determine vent gas composition especially when testing has already been conducted on similar materials. Research and process development specialists with knowledge of the process chemistry can typically identify the types of byproducts that will be generated in the process.

Testing that is conducted either in the laboratory or at the pilot plant should be adequate in identifying the types and quantities of materials that are present in full-scale manufacturing units. In addition, sample collection and analysis may be greatly simplified due to the size of the process streams and proximity to the division's centralized analytical facilities. During 3M's commercialization process for new products, analysis may be conducted for various product and byproduct streams. In 3M's Chemical Process Development Center (CPDC), the manufacturing schemes are normally carefully designed so as to properly duplicate factory operating conditions. 3M believes that information that is generated at any of these facilities will be representative of factory operations. Testing conducted in similar manufacturing operations elsewhere should also be sufficient.

Finally, 3M has completed a significant body of emissions source testing as a part of the development of its corporate greenhouse gas inventory. 3M has completed a corporate GHG inventory since 2002. The methodologies have been validated in two rigorous third party audits using EPA approved companies. The inventory includes a calculated overall uncertainty that has been determined using rigorous statistical techniques. Data generated has a part of this work has been provided to the EPA Climate Leaders program since 2003. Much of this work dealt with the identification of the chemistry that was present. This work has already allowed 3M to confirm its knowledge of process stream contents. Much of the scoping analysis has already been completed.

The analysis provided in Attachment 1 provides a good example where a scoping analysis would not be necessary for different types of products. In this case there are a limited number of raw materials that are added in different quantities. Any products or byproducts that are present in this process would also be the same.

Because there are so many different methods and combination of methods that would be employed to meet the requirements of this section, 3M believes that it would be inappropriate to specify a single approach. We acknowledge that the regulated entity has an obligation to exercise a standard of care in its analysis of air stream contents and to properly document the methods that were used to make these assessments. We believe that such assessments would be conducted, captured in a written document as described in the facility's GHG Monitoring Plan, and retained in the facility record. We believe that the diversity of methods that may be used in the assessments can be captured in simple changes to the language in §98.124 (a) by substituting the word "analysis" for "test". (a) Initial scoping analysis for fluorinated GHGs. You must conduct an initial scoping analysis to identify all fluorinated GHGs that may be generated from processes that are subject to this subpart and that have uncontrolled emissions (i.e., pre-control emissions levels) of 1.0 metric ton or more of fluorinated GHGs. For each process, you must conduct the initial scoping analysis on the stream(s) (including process streams or destroyed streams) or process vent(s) that would be expected to individually or collectively contain all of the fluorinated GHG by-products of the process. Initial scoping analysis must be conducted according to the procedures in paragraph (c)(4)(v) of this section.

In addition to the above, 3M believes that any "testing" requirement should be aligned with the regulatory thresholds that are being established in the rule for source testing. In most cases, a "scoping test" would be conducted as a part of the stack testing project and not as a separate activity. Prior to any facility emission test, process chemistry will typically be reviewed with the appropriate experts. The testing methods employed in the field will be based on these reviews, but contingent measures (such as canister sample collection) are employed to verify vent stream composition.

Procedures for chemical analysis are referenced in §98.124 (c)(4)(v) and our comments on these methods are contained in that section.

Response: EPA is retaining the proposed requirement to sample and analyze process streams or process vents to identify the full set of fluorinated GHGs that are generated by the process. Consequently, EPA is not adopting the broader term "scoping analysis" suggested by the commenter, although EPA is changing the term "scoping test" to "scoping speciation" to clarify that stack testing is not required.

The initial scoping speciation requirement ("scoping test" in the April 2010 proposed rule) is designed to ensure that facilities identify all fluorinated GHGs that are released from their process. Facilities can then use this information to better inform their emission estimates, e.g., to identify the set of fluorinated GHGs to include in emission testing and emission characterization measurements. Most facilities have indicated that their prior scoping measurements have been performed on pilot-scale processes or laboratory-scale processes instead of a full-scale process; however, EPA has concerns that these data may not reflect the actual compounds that are present in the streams. As noted in the preamble of April 2010 proposed rule, some fluorinated gas producers have stated that they found compounds in the full-scale process that they did not find in the pilot- or laboratory-scale processes. In some cases, this may have occurred because the analytical methods used at the pilot- or laboratory-scale were not sensitive enough to detect fluorinated GHGs that were present at low (but still higher than trace) concentrations; in other cases, it may have occurred because subtle differences between the laboratory- and full-scale processes led to the generation of new or different by-products.

In the final rule, EPA is clarifying that if a facility has previously conducted measurements on full-scale processes to identify fluorinated GHGs that meet the requirements in §98.124(a), these data may be used to satisfy the subpart L initial scoping speciation requirements. These previous measurements may be used if conducted less than 10 years prior to the effective date of the rule. The initial scoping speciation is not intended to quantify emissions but is intended to identify compounds, and this has been clarified in the final rule. However, a facility may conduct the initial scoping speciation in conjunction with the emissions testing (or emission characterization), as a combined activity, if the streams or process vents selected for testing meet the requirement for being likely to contain all the fluorinated GHGs generated by the process, and if the measurements are sensitive enough to detect fluorinated GHGs that occur anywhere in the process above trace concentrations. The final rule includes requirements for making measurements on the full-scale process to identify the fluorinated GHG present. In order to minimize the burden placed on facilities, EPA is only requesting that those streams or process vents that are most likely to contain all fluorinated GHG by-products and products present in that particular process be analyzed, e.g., could be a single stream or two or three streams. We have clarified in the rule text that facilities are not required to test every stream or process vent, and facilities may certainly test upstream process streams to identify compounds.

EPA has included revised sampling and analytical methods in §98.124(e) to allow facilities to select appropriate, validated methods (including validated, industry-accepted methods) and to document their use in the facility GHG Monitoring Plan. The initial scoping speciation does not have to be conducted using EPA emission testing or stack testing reference methods; other methods meant for process stream sampling and analysis may also be used, as the facility identifies streams most likely to individually or collectively contain all the fluorinated GHGs generated by the process. These measurements may be taken upstream for process streams or for process vents, at any location that provides significant concentration of the fluorinated by-products present. Certainly contingent methods that the commenter refers to that meet the requirements in revised §98.124(e), i.e., the methods have been validated, may be used.

EPA has established a threshold to limit the initial scoping speciation requirement to those processes that have at least one process vent that has uncontrolled emissions of 1 mt fluorinated

GHG per year. This is a change from the April 2010 proposed threshold which was 1 mt fluorinated GHG emitted from the process. The revised threshold is on a process vent basis to make it more consistent with the process vent threshold for emission factor development, and does not require consideration of equipment leak emissions that would be included for a process-based threshold. The initial scoping speciation threshold has been based on the mass of fluorinated GHGs rather than a CO_2e limit to address the possibility that facilities may currently assume that emissions occur in the form of one fluorinated GHG when they actually also occur in the form of another, currently unidentified fluorinated GHG. In such cases, a preliminary GWP weighting would yield an incorrect estimate of CO_2-equivalent emissions from the process vent.

Commenter Name: Ross Smith
Commenter Affiliation: PCS Phosphate Company, Inc
Comment Number: EPA-HQ-OAR-2009-0927-0084.1
Comment Excerpt Number: 3

Comment: The scoping requirement would be required to determine which fluorinated GHGs are emitted from all vents and emission points at the facility. The scoping test requirement will impose more cost burden on the facility without providing a significant amount of value. Many engineering and process studies have been performed documenting what fluorinated compounds are emitted during the manufacturing process and this test is redundant of these activities. The test is also required as a one-time activity, and depending on the plant configuration or formulation of materials, the emissions could differ and the test would no longer represent the emissions. This requirement should be removed from the proposal, as this information is already available from process engineering studies and other widely accepted reference material concerning the manufacture of fluorinated materials.

Response: Please see the responses to comment number EPA-HQ-OAR-2009-0927-0111.1, excerpt 13 and to comment number EPA-HQ-OAR-2009-0927-0128.1, excerpt 13.

Commenter Name: Joel R. Hall
Commenter Affiliation: Mexichem Fluor Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0104
Comment Excerpt Number: 5

Comment: Allow methods other than those specified in §98.124(c)(4)(v) for the initial scoping study. The initial scoping study required under §98.124(a) must be conducted according to the procedures in §98.124(c)(4)(v). The procedures listed under §124(c)(4)(v) are extractive procedures (i.e., require that a sample of the stream be extracted from the process and analyzed). Mexichem's concern with these procedures is the potential for exposure to employees and/or contractors to HF and the ability of analytical equipment to properly function in the presence of HF. In addition, Mexichem's production process was not constructed with sampling ports appropriate for the methods provided. Additional time may be required to install appropriate sampling points (see comment 5 below). Mexichem requests that the agency allow the use of non-extractive engineering assessments for the initial scoping study.

Response: EPA recognizes the additional safety concerns associated with the testing of streams that contain HF. In order to address site-specific sampling and testing issues and safety concerns, EPA has modified the language identifying the permissible testing procedures (located in §98.124(e) in the final rule) to allow facilities to use an alternative testing procedure so long as it is quality-assured and capable of detecting the analytes of interest at the concentrations of interest. The scoping speciation is a one-time measurement, and facilities have until February 29, 2012 to complete it, which EPA believes will generally provide adequate time to design and carry out sampling safely. However, where this is not the case, the best available monitoring methods (BAMM) provisions permit facilities to request to use BAMM for "unique and extreme circumstances which include safety, technical infeasibility, or inconsistency with other local, State or Federal regulations."

Commenter Name: Brian R. Keck
Commenter Affiliation: Air Products and Chemicals, Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0106.1
Comment Excerpt Number: 28

Comment: The proposed scoping test in §98.124(a) is overly complex and in many cases, unnecessary. Chemical facilities typically know what compounds are present in factory streams. There are other methods, besides this proscribed scoping test, that facilities can use to determine the compounds present in factory streams. Vent stream contents may be determined by a variety of methods which include past information, measurements involving processes with similar chemistries, and data obtained during bench scale and pilot plants. Air Products appreciates our obligation to conduct due diligence to adequately understand our FGHG emissions content, but this requirement should more generally state the facility will need to document the methods that were used to make this determination.

Section 98.124(a) requires the initial scoping test be performed by emission testing protocols in paragraph (c)(4)(v). Conducting the scoping study by stack test methods would be unnecessarily burdensome and costly. Some process vents with hazardous chemicals (HF, PFIB) are hazardous to test. When sampling these types of streams, the hazards can be multiplied because there might not be an existing sampling point. Also, some of the streams require a full acid suit and breathing apparatus for connecting and disconnecting the sample cylinder. The sample systems that would be installed would most likely be ¼" or ½" tubing manifolds that would include connections for the sample cylinder itself but also ports for N_2, solvent washout, vacuum, etc. To make and break these small connections while in an acid suit requires dexterity beyond that required for working with normal plant scale piping systems. For safety reasons, EPA needs to allow upstream process testing by validated, industry accepted methods to assess fluorinated GHG byproducts. Alternatively, Air Products also recommends that any standard GC/ECD, GC/MS, FTIR or similar analytical methods used to characterize the emitted constituents within five (5) years of the effective date of the final rule be acceptable, rather than having to conduct similar tests once again. Five (5) years following the effective date of the final rule, any emissions testing should be performed per the requirements and applicable methods specified in the rule, where practicable.

Response: Please see the responses to comment number EPA-HQ-OAR-2009-0927-0111.1, excerpt 13, and comment number EPA-HQ-OAR-2009-0927-0104, excerpt 5.

Commenter Name: Jeff C. Muffat
Commenter Affiliation: 3M Center
Comment Number: EPA-HQ-OAR-2009-0927-0111.1
Comment Excerpt Number: 2

Comment: 4. 3M has obtained a great deal of information on process emissions through previous testing. In addition, process gases are generally well characterized during the commercialization of new products. We endorse the intent of the "scoping" requirement and as a routine activity we have obtained this information. However, we believe that this information can be obtained through a variety of methods.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0111.1, excerpt 13.

Commenter Affiliation: Arkema Inc.
Commenter Name: Rich Raiders
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 45

Comment: EPA appropriately set a minimum threshold for the proposed §98.124(a) scoping test. However, the 1 mtpy of uncontrolled FGHGs threshold should be increased. GWPs vary widely, and use of a GWP weighted testing (based on typical GWPs for FGHGs in use today) threshold would encourage low-GWP product development and marketing. EPA should modify proposed §98.124(a) to reflect a GWP-weighted 10,000 to 25, 000-mtpy CO_2e basis per vent. EPA should harmonize testing levels with the recently finalized GHG reporting rule. The reporting rule ramps down the level of scrutiny for prevention of significant deterioration ("PSD") permitting per 40 CFR 52. Likewise, EPA should consider allowing facilities to perform testing protocols on only the larger sources (50,000 or 100,000-mtpy CO_2e for the first two years, with smaller sources tested as the program matures and technologies improve.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0111.1, excerpt 13.

Commenter: Brian R. Keck
Organization: Air Products and Chemicals, Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0106.1
Comment Excerpt Number: 11

Comment: In [section] B. Fluorinated Gas Production, Section 4, [of the re-proposal preamble] EPA requests comments on an alternative approach in which all fluorinated gas production facilities, regardless of their estimated pre-control emissions, would analyze their emissions using an initial scoping test proposed to ensure the facilities understand the identities, and therefore the GWPs, of the fluorinated GHGs potentially emitted. Air Products recommends that the list of GHGs contained in Table A-1 of Subpart A be the complete list of regulated GHGs and GWP values.

Response: EPA has not adopted a no-threshold approach for the initial scoping speciation. We did not open the definition of fluorinated GHG to comment in this rulemaking; however please see the response to comment number EPA-HQ-OAR-2009-0927-0117.1, excerpt 2 for a discussion of how we have designed the requirements of this rule to ensure consistency among facilities in how they monitor and report emissions of fluorinated GHGs that do not have GWPs listed in Table A-1 to subpart A.

Commenter Name: Craig Holt Segall
Commenter Affiliation: Sierra Club
Comment Number: EPA-HQ-OAR-2009-0927-0128.1
Comment Excerpt Number: 13

Comment: We agree with EPA that facilities should be required to conduct a scoping test identifying all fluorinated GHGs which they may emit, and that this testing should be conducted on emissions streams before control devices are applied. We generally agree it may be appropriate to exempt certain, very small emissions sources from this test.

We are less persuaded that this scoping test should be conducted only once in the life of a facility, as EPA proposes. Fluorinated gas production facilities are complex chemical factories. Processes may change over time, equipment may change or corrode, and feedstocks may vary. These changes may, in turn, affect emissions. We urge EPA to therefore require periodic re-tests, either on at least a 5-year cycle or whenever a facility materially alters its processes, equipment, design, or feedstocks.

Response: Although physical or material changes to a process do not trigger a repeat scoping speciation under the final rule, EPA has captured these operating scenario modifications and the effect on fluorinated GHG emissions by requiring facilities to revisit (and if necessary, revise) emission calculation factors, emission factors, and emission characterizations (the emission measurements for the mass-balance approach) when operating scenarios are modified. The rule requires that emission calculation factors be recalculated whenever they are affected by operating scenario modifications. The rule requires that emission factors and emission characterizations be updated through new emission testing if the operating scenario modification results in a calculated fluorinated GHG emission factor change of 15 percent or greater. (For emission characterizations, this 15 percent change refers to a change in the percentage of total fluorine emissions represented by any of the emitted fluorinated GHGs, that is, a change in the mixture rather than the magnitude. Changes in the magnitude are captured in the monthly (or more frequent) mass-balance measurements.) We also include a general update requirement for emission factors and emission characterizations; facilities are required to conduct testing and revise the factor every 10 years.

Please see the response to comment number EPA-HQ-OAR-2009-0927-0111.1, excerpt 15 for more discussion of emission factor updates and their rationale.

Commenter: Brian R. Keck
Organization: Air Products and Chemicals, Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0106.1
Comment Excerpt Number: 12

Comment: In [section] B. Fluorinated Gas Production, Section 5.b. [of the re-proposal preamble], EPA states that facilities would be required to sample the vents or streams that would be expected to contain all the fluorinated GHG by-products for the process using listed EPA and ASTM methods to identify fluorinated GHGs that occur in concentrations above 0.1 percent in emitted streams. This initial scoping must be performed by prescriptive and limited emission testing protocols. Conducting the scoping study by stack test methods would be unnecessarily burdensome and costly. To avoid excessive testing and re-testing costs, Air Products recommends that standard GC/ECD, GC/MS, FTIR or similar analytical methods used by the facilities on these vents or streams to characterize the emitted constituents within five (5) years of the effective date of the final rule be acceptable, rather than having to conduct similar tests once again.

Response: Please see the responses to comment number EPA-HQ-OAR-2009-0927-0111.1, excerpt 13, and comment number EPA-HQ-OAR-2009-0927-0104, excerpt 5.

Commenter Name: John Dege
Commenter Affiliation: DuPont
Comment Number: EPA-HQ-OAR-2009-0927-0103.1
Comment Excerpt Number: 24

Comment: The Preamble (pg 18673) states “EPA is proposing to limit the scoping test requirement to processes that would emit more than one metric ton...”. The same paragraph does make it clear that engineering calculations can be used to estimate the mass of FGHG emitted from the process. This is in contrast to the “preliminary estimate of emissions” prescribed in §98.123(b) that requires emissions to be determined from “each individual process vent”. The scoping test and emission factor test should be on the same basis; i.e., by individual process vent so that common data and calculations can be used more effectively for both regulatory sections. Estimating total emissions by process would require estimating emissions from equipment leaks which would be imprecise prior to conducting the equipment leak testing as required in section §98.123(c). The scoping study should only be required for process vents, not equipment leaks.

Response: Please see the responses to comment number EPA-HQ-OAR-2009-0927-0111.1, excerpt 13, and comment number EPA-HQ-OAR-2009-0927-0104, excerpt 5.

Commenter Name: Brian R. Keck
Commenter Affiliation: Air Products and Chemicals, Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0106.1
Comment Excerpt Number: 27

Comment: The preamble (pg 18673) states "EPA is proposing to limit the scoping test requirement to processes that would emit more than one metric ton..." The same paragraph does make it clear that engineering calculations can be used to estimate the mass of fluorinated GHG emitted from the process. This is in contrast to the "preliminary estimate of emissions" prescribed in §98.123(b) that requires emissions to be determined from each individual process vent. The scoping test and emission factor test should be on the same basis, i.e., by individual process vent so that common data and calculations can be used more effectively for both regulatory sections. Estimating total emissions by process would require estimating emissions from equipment leaks which would be imprecise prior to conducting the equipment leak testing as required in §98.123(c). Furthermore, EPA needs to clarify the time period for the one metric ton emission, as well as the fact that only fluorinated GHG emissions count towards the one ton threshold.

Response: Please see the responses to comment number EPA-HQ-OAR-2009-0927-0111.1, excerpt 13, and comment number EPA-HQ-OAR-2009-0927-0104, excerpt 5.

Commenter Name: Lorraine Krupa Gershman
Commenter Affiliation: American Chemistry Council
Comment Number: EPA-HQ-OAR-2009-0927-0092.1
Comment Excerpt Number: 27

Comment: The proposed scoping test in §98.124(a) is overly complex and in many cases, unnecessary. Chemical facilities typically know what compounds are present in factory streams. There are other methods, besides this prescribed scoping test, that facilities can use to determine the compounds present in factory streams. Vent stream contents may be determined by a variety of methods, including historical information, measurements involving processes with similar chemistries, and data obtained during bench scale and pilot plants. ACC member companies understand that they have an obligation to conduct due diligence to adequately understand their emissions content, but this requirement should more generally state the facility will need to document the methods that were used to make this determination.

Page 18674 of the preamble states that "EPA is proposing to limit the scoping test requirement to processes that would emit more than one metric ton..." The same paragraph makes it clear that engineering calculations can be used to estimate the mass of fluorinated GHG emitted from the process. This is in contrast to the "preliminary estimate of emissions" prescribed in §98.123(b) that requires facilities to "estimate the annual uncontrolled emissions of fluorinated GHG for each process vent within a process." The scoping test and emission factor test should be on the same basis, i.e., by individual process vent so that common data and calculations can be used more effectively for both regulatory sections. Estimating total emissions by process, as dictated by the scoping test, would require estimating emissions from equipment leaks which would be imprecise prior to conducting the equipment leak testing as required in §98.123(c). Furthermore, EPA needs to clarify the time period for calculating the one metric ton emission, as well as the fact that only fluorinated GHG emissions count towards the one ton threshold.

Section 98.124(a) requires the initial scoping test be performed by emission testing protocols in paragraph (c)(4)(v). Conducting the scoping study by stack test methods would be unnecessarily burdensome and costly. Some process vents with hazardous chemicals (HF, PFIB) are hazardous to test. When sampling these types of streams, the hazards can be multiplied because there might not be an existing sampling point. Also, some of the streams require a full acid suit and breathing apparatus for connecting and disconnecting the sample cylinder. The sample systems that would be installed would most likely be ¼" or ½" tubing manifolds that would include connections for the sample cylinder itself but also ports for N2, solvent washout, vacuum, etc. To make and break these small connections while in an acid suit requires dexterity beyond that required for working with normal plant scale piping systems. For safety reasons, we recommend that emissions be measures post-destruction device, and, if necessary, EPA should allow upstream process testing by validated, industry accepted methods to assess fluorinated GHG byproducts.

Response: Please see the responses to comment number EPA-HQ-OAR-2009-0927-0111.1, excerpt 13, and comment number EPA-HQ-OAR-2009-0927-0104, excerpt 5.

Commenter Name: John Dege
Commenter Affiliation: DuPont
Comment Number: EPA-HQ-OAR-2009-0927-0103.1
Comment Excerpt Number: 25

Comment: Scoping study stack testing, and engineering calculation options are unclear. Unsafe to stack test considerations should be provided. EPA: Section 98.124(a) requires the initial scoping test to be performed by emission testing protocols in paragraph (c)(4)(v). Page 18674 of the preamble states "For purposes of estimating the mass of fluorinated GHG emitted from the process, facilities could use the same types of engineering calculations that they would use to determine whether process vent testing was required under the PSEF approach…" Section 98.124(c)(1) requires stack testing every 5 years to validate emission factors for vents that emit greater than 1Mtn/yr. Comment: Conducting the scoping study by stack test methods would be unnecessarily burdensome and costly. Some process vents with hazardous chemicals (Hydrogen Fluoride, Perfluoroisobutene) are hazardous to test. When sampling these types of streams, the hazards can be multiplied because there might not be an existing sampling point. Also, some of the streams require a full acid suit and breathing air for connecting and disconnecting the sample cylinder. The sample systems that would be installed would most likely be ¼" or ½" tubing manifolds that would include connections for the sample cylinder but also ports for N_2, solvent washout, vacuum, etc. To make and break these small connections while in an acid suit requires dexterity beyond that required for working with normal plant scale piping systems. Some of our processes contain chemicals that are corrosive, toxic, or highly flammable with the potential to deflagrate if exposed to air during sampling. Increasing the personnel and environmental risks and costs for these additional sampling points are unnecessary for emission estimating purposes. EPA needs to allow up-stream process testing by validated, industry accepted methods to assess FGHG byproducts. Section 98.124(a) also needs to allow use of paragraph §98.124(c)(4)(vi) which allows alternative methods.

Response: Please see the responses to comment number EPA-HQ-OAR-2009-0927-0111.1, excerpt 13, and comment number EPA-HQ-OAR-2009-0927-0104, excerpt 5.

Section 5.2 - Mass Balance Approach

Commenter Name: Dave Stirpe
Commenter Affiliation: Alliance for Responsible Atmospheric Policy
Comment Number: EPA-HQ-OAR-2009-0927-0117.1
Comment Excerpt Number: 8

Comment: The 1% calibration standard, instead of 0.20 percent, removes a substantial implementation barrier, but the Alliance is still concerned that it may be too tight given daily fluctuations in operations.

Response: We would like to clarify that the 1 percent accuracy and precision requirement at §98.124(c)(3) (formerly §98.124(c)(5) in the April 2010 proposed rule) applies to activity data used to develop emission factors and to estimate emissions under the emission factor approach. (Specifically, the provision requires such activity data to be measured using flow meters, weigh scales, or other measurement devices with an accuracy and precision of ±1 percent of full scale or better.) These accuracy and precision requirements are the same as those required for mass measurements under subpart OO, which were established based on comments from fluorinated GHG producers.

As discussed in the preamble of the final rule and in the response to comment number EPA-HQ-OAR-2009-0927-0085.1, excerpt 49, EPA is establishing different precision and accuracy requirements for measurements under the mass-balance approach than for measurements under the emission factor approach. This is to ensure that the emission estimates developed using either approach are comparably precise and accurate despite the mathematical differences between the approaches. The rule’s various accuracy and precision requirements are discussed further in the preamble to the rule and elsewhere in this Response to Comments document (see the responses to comment number EPA-HQ-OAR-2009-0927-0084.1, excerpt 4; comment number EPA-HQ-OAR-2009-0927-0104, excerpt 3; and comment number EPA-HQ-OAR-2009-0927-0128.1, excerpt 15).

Commenter Name: Lorraine Krupa Gershman
Commenter Affiliation: American Chemistry Council
Comment Number: EPA-HQ-OAR-2009-0927-0092.1
Comment Excerpt Number: 28

Comment: Section 98.124(b)(2) requires that "The following concentration measurements shall be measured on a regular basis using equipment and methods (e.g., gas chromatography) with an accuracy and precision that allow the facility to meet the error criteria in §98.123(a):…" It is unclear how "regular basis" is defined. We believe that EPA should clarify that "regular basis" is every five years, or more frequently, as appropriate and documented in the facility's GHG Monitoring Plan.

Response: In the final rule, we have clarified that the concentration measurement frequency for the mass balance approach is at least one time per month. As discussed in the preamble of the April 12, 2010 proposed rule (75 FR 18675), this was what we intended, rather than the generic "regular basis" text. Note that under the final rule, facilities using the mass-balance approach may be required to measure concentrations more frequently under some circumstances. For more discussion of sampling frequency under the mass-balance approach, please see the preamble of the final rule and the responses to comment number EPA-HQ-OAR-2009-0927-0128.1, excerpt 15 and comment number EPA-HQ-OAR-2009-0927-0092.1, excerpt 26.

Commenter Name: John Dege
Commenter Affiliation: DuPont
Comment Number: EPA-HQ-OAR-2009-0927-0103.1
Comment Excerpt Number: 29

Comment: "On a regular basis" for analysis of vent streams should be a 5 year frequency. EPA: Section 98.124(b)(2) states: "The following concentration measurements shall be measured on a regular basis using equipment and methods …" Comment: The testing frequency should be consistent with Subpart L, and typical Title V stack testing frequencies unless a significant process change occurs.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0092.1, excerpt 28.

Section 5.3 - Process Vent Emissions Factor Testing

Section 5.3.1 - Operating scenarios

Commenter Name: Jeff C. Muffat
Commenter Affiliation: 3M Center
Comment Number: EPA-HQ-OAR-2009-0927-0111.1
Comment Excerpt Number: 26

Comment: §98.124 (c)(2), Different Operating Conditions. Vent gas measurements are an important element in the development of emission factors for certain types of sources. However we believe that this method can also [be] combined with other methods to define emissions under slightly different operating conditions. We offer the following examples:

1. Two different systems may operate at different rates, but the final product will be the same and the mass emission factors, i.e., kg F-GHG emitting/kg product, will also be the same.
2. Two pieces of equipment produce the same product. For one process, during system stabilization, a small amount of product will be vented to the pollution control device as an operational control. This does not occur in the other process. In this case, we would adjust the emission factors to account for the product loss using engineering calculations.

Response: EPA agrees that for closely related operating scenarios, it is appropriate to allow facilities to use calculations to adjust the emission factor measured for one operating scenario to develop an emission factor for the other operating scenario.

To assess whether a continuous process vent emits 10,000 mtCO_2e or more (and therefore must be tested), facilities are required to sum the process vent's emissions across all of the operating scenarios for the process for the year. If emissions from the vent equal or exceed 10,000 mtCO_2e, facilities are required to identify the operating scenario with the largest emissions and conduct emissions testing on that operating scenario. Emissions testing of other operating scenarios is only required if (1) emissions under the other scenario equal or exceed 10,000 mtCO_2e, and (2) the emission calculation factor for the other scenario differs from the emission calculation factor of the scenario with the largest emissions by 15% or more (and this difference is not due solely to the application of a destruction device under one of the operating scenarios). Under these circumstances, applying an adjusted emission factor to the second operating scenario would result in an emissions estimate with significant uncertainty, due to the significant differences between the emission rates (i.e., emission calculation factors) of the two operating scenarios and the size of the emissions from the second. However, for other operating scenarios that do not meet these criteria, the facility may develop an adjusted emission factor by multiplying the emission factor measured for the first scenario by the ratio of the emission calculation factor for the other scenario and the emission calculation factor for the first scenario.

It is anticipated that adjusting emission factors for multiple operating scenarios will rarely be a significant issue in the fluorinated gas production source category. Processes with multiple operating scenarios are most likely to be batch processes, and batch processes in the final rule may develop emission calculation factors for process vents (i.e., they are not required to conduct emission testing). Continuous processes are less likely to have multiple operating scenarios, although some facilities have indicated that there could be cases where this exists (one facility mentioned as an example the use of "flexible operating units", under the HON, where more than one product is made in equipment). Consider an example where a facility has two identical production lines or perhaps two similar production lines that make the same product. In the case with two identical production lines making the same product, the two production lines would be part of one process, and both lines together would represent one operating scenario (because the equipment is identical), if each line were vented to the same control device. The emission factor developed from emission testing on the first line could be applied to the second line, without additional testing or emission calculations required. In a case where a facility had two production lines that were similar, but one was larger volume than the other, for example, the two production lines would be part of one process, but each line would be a separate operating scenario. To determine whether testing would be conducted, a facility would sum the emissions for each process vent over all operating scenarios emissions that are sent to that process vent. If the combined emissions for a process vent (summed for the two operating scenarios that are sent through the vent) are greater than or equal to 10,000 $mtCO_2e$, then the larger operating scenario with the most significant annual emissions would be tested. Depending on the size of the second operating scenario, an emission calculation could be conducted for the second operating scenario or additional testing may be done. If the emissions of the second line (operating scenario) through the process vent, in themselves, exceeded 10,000 $mtCO_2e$, the facility would develop emission calculation factors for both the first and the second operating scenarios. The facility would then compare the two emission calculation factors. If the difference was more than 15 percent, the facility would conduct emission testing on the second operating scenario. If the difference was less than 15 percent, the facility would adjust the emission factor developed for the first operating scenario.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 44

Comment: Proposed §98.127(b)(7) requires reporters to identify “whether the process was representative or whether it was another operating scenario.” We believe that EPA is requesting reporters to document operating scenario changes over time and times where operations were not representative of the §98.124 basis. EPA should clarify this language, and include provisions documenting new operating scenarios and process changes that do not constitute new operating scenarios.

Response: EPA has removed the operating scenario paragraph from §98.127, Reporting requirements, and has clarified when differences between and changes to operating scenarios trigger new calculations or testing. Differences between operating scenarios are discussed in the response to comment number EPA-HQ-OAR-2009-0927-0111.1, excerpt 26. For more discussion of this issue, please see the response to comment number EPA-HQ-OAR-2009-0927-0085.1, excerpt 47.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 52

Comment: EPA should further clarify that the §98.124(h) control device deviation requirements do not apply for alternate operating scenarios reflecting Clean Air Act permit or applicable requirement authorized activities.

Response: The term “deviation” has been removed from the final rule text. The rule text now explains that, rather than reporting periods of deviations of the destruction device, facilities should report any emissions that occur during these deviation periods, if applicable.

With respect to defining different operating scenarios, this could certainly be done. For example, a facility could define one operating scenario for the process that included venting fluorinated GHG emissions to the destruction device. Because the destruction device could malfunction, the facility could also define another operating scenario that included venting of fluorinated GHG emissions to another control device, or simply uncontrolled venting or bypass. In general, as long as a facility tracks the process activity associated with each defined operating scenario and accounts for the emissions during the year for each situation, defining different operating scenarios is acceptable.

For further discussion of this issue, please see the response to comment number EPA-HQ-OAR-2009-0927-0085.1, excerpt 50.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 41

Comment: EPA should clarify certain details concerning the proposed §98.124(f)(5) process change requirements. First, EPA should clarify that the §98.123(b)(1) preliminary assessment is an appropriate process to conduct the process change analysis.

Response: We have deleted paragraph §98.124(f)(5) from the final rule text, and use of the term “process change” has been taken out of the final rule. We have clarified in the final rule that modifications or changes to operating scenarios would require a check on the emission factor. We agree that the emission calculations conducted for the preliminary assessment of emissions are appropriate to evaluate changes in the magnitude of emissions from modifications. Please see the response to comment number EPA-HQ-OAR-2009-0927-0085.1, excerpt 44 for more discussion of this issue.

Section 5.3.2 - Identify Emission Episodes (e.g., using emissions profiles)

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 24

Comment: EPA proposed to require testing of process vents emitting more than 10,000-mtpy CO_2e FGHG not routed to a control device reducing emissions by at least 99.9%. However, EPA did not clarify in the proposed 40 CFR 98.124(c) that recognized batch emissions evaluation methods could be used. Pharmaceutical MACT allows batch process operators to develop an “emissions profile” per 40 CFR 63.1257(b)(8)(ii)(A) that allows the operator to document the magnitude of emissions across a batch manufacturing process. 40 CFR 63.1257(b)(8)(i)(A) then allows the operator to choose among three batch testing situations, each of which demonstrates emissions (and control device performance, if appropriate) under appropriate testing conditions. For Part 98 testing, the reporter could prepare the emissions profile on a GWP basis in lieu of the RSD basis in proposed 40 CFR 98.124(c)(3). This proposal would also optimize testing time, especially when a reporter can demonstrate in the profile that a peak emissions event occurred during multiple batch episodes.

To meet the three one-hour runs required at §98.124(b)(3), the reporter should be required to test during the peak emissions event for three successive batches, where the peak event time must be contained with the test run time. If the peak event occurs over less than one hour, the test run would continue for one hour. If the peak event occurs over more than one hour, the test may need to be extended long enough to encompass the appropriate peak, as provided for in 40 CFR 63.1257(b)(8). If the outlet concentration during the peak emission event is below the method detection limit, as described above, the test would show compliance for the entire batch cycle.

Response: As discussed in the preamble, we are allowing facilities to use emission calculation factors for all batch processes regardless of size due to several technical issues that make it difficult to develop accurate emission factors for batch process vents based on emission testing.

Commenter Name: Lorraine Krupa Gershman
Commenter Affiliation: American Chemistry Council
Document Control Number: EPA-HQ-OAR-2009-0927-0092.1
Comment Excerpt Number: 27

Comment: We are concerned about the requirements for characterizing batch process emissions. There are many technical problems associated with the characterization of batch emission episodes using traditional stack testing methodologies. Our great concern about testing of batch processes is not when to perform the test (i.e., when the process vent is open) or the test protocol (stack test protocol options are well established), but rather how to get a representative sample and representative flow rate. To get a representative emission rate using stack sampling, the vent rate and composition need to be relatively constant and/or predictable over the sampling period. This cannot be accomplished with many of our batch operations. However, there are EPA approved methods for calculating these emissions. We are already using these methods to calculate our air emissions for Title V purposes. We propose that if these emissions need to be determined, using the calculation methods should be the approved approach to estimate the emissions. The Miscellaneous Organic NESHAP recognizes these issues and only requires engineering calculations to characterize these emissions, especially from these processes. The Miscellaneous Organic NESHAP calculation protocol focuses testing on those batch steps that emit the most materials, or those steps that comprise most of the batch emissions. ACC urges EPA to allow reporters to profile batch emissions and use the profiles to guide testing. EPA should further extend this concept to provide that, below certain significance thresholds, testing is not required. We believe that the significance thresholds used in subpart OO reporting, in terms of CO_2-equivalent mass per year or mass per year of compounds not identified on Part 98 Table 1, are appropriate to focus testing efforts on significant emission points.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-085.1, excerpt 24.

Section 5.3.3 - Continuous Process Vent Emissions Factor Testing

Commenter Name: Jeff C. Muffat
Commenter Affiliation: 3M Center
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 27

Comment: §98.124 (c)(3), Number of Runs Continuous Process Vents. 3M has previously discussed its concerns regarding the ability to specifically identify all components that are contained in every gas stream. 3M would have similar concerns with the requirements in this section. For continuous process vents, we are requesting that the testing be limited to three one hour runs as this is consistent with testing specifications that are listed in other rules. If the 0.2 RSD requirement is applied to each fluorinated-GHG that is contained in a vent stream, we believe that six (6) runs would likely be required for every emission factor. When viewed as the total mass of fluorinated-GHG or the total of sum of CO_2e contained in the gas stream, we believe that the 0.2 RSD would be more easily achievable. Typically 3M has conducted this type of testing using FTIR analytical instrumentation which provides continuous results of process vent composition. In these cases, we will be able to determine an RSD during the stack gas sampling campaign. We are most concerned about the application of the accuracy requirement to constituents that would be present at smaller concentrations and the ability to meet this requirement for every constituent.

Response: In the final rule, we are retaining a requirement to evaluate the relative standard deviation of the three test run emission factors in order to determine whether more than three test runs are necessary. However, for purposes of calculating the relative standard deviation (RSD) of sample emission factors, we are allowing facilities to apply a default GWP of 2000 to fluorinated GHGs that do not have GWPs listed in Table A-1 to subpart A. In general, we anticipate that this will make it easier for facilities to meet the RSD requirement and avoid additional testing.

As noted in the March 2010 Technical Support Document, a minimum of three emission test runs is appropriate to determine the variability of the emission rate for a given operating scenario. In cases where there is little variability among these three runs, and therefore the RSD is low, the average of these values is likely appropriate for use in determining the emission factor for the process. However, if these three runs show significant variability, such that the RSD is high, then this average is likely a poor representation of the actual mean emission rate from the process, and additional samples must be taken in order to develop a robust emission factor.

In the final rule, we have decreased the RSD level that triggers additional testing from 20 percent to 15 percent. This change was necessary to ensure a reasonable level of consistency between the precision requirements for process vent emission factor measurements and the precision requirements for measurements elsewhere in subpart L and in other EPA methods. As we proposed, we are setting a relative error limit of 30 percent[1] for estimates developed using the mass-balance approach. The uncertainty (based on a 95-percent confidence level) of an emission factor that is based on three emission measurements with an RSD of 20 percent is 50 percent,[2] which is considerably higher than the 30-percent limit set for the mass-balance approach. To provide 95-percent confidence that the measured emission factor fell within 30 percent of the true mean emission rate for the process after just three samples, the maximum RSD would be 12 percent. However, as noted in the Technical Support Document, this could be a difficult RSD to meet even when the real emission rate was nearly constant because the error of the concentration measurements used in the testing can be near 10 percent. An RSD of 15 percent, in contrast, is likely to be broadly achievable, and does provide 95-percent confidence that the measured emission factor falls within 40 percent of the true mean emission rate.[3] Moreover, an RSD of 15 percent is used to trigger additional testing in at least one other EPA method. Specifically, EPA's method for validating test methods, Method 301 (Field Validation of Pollutant Measurement Methods from Various Waste Media), requires three replicate samples for follow-up testing if the RSD of the samples is 15 percent or lower, but requires six replicate samples if the RSD of the samples falls between 15 and 30 percent.

While the decrease in the RSD level that triggers additional testing would, by itself, increase the stringency of the final rule compared to the April 2010 re-proposal, other changes between the re-proposed and final rule are likely to counteract this increase. First, as noted above, we are permitting facilities to calculate their RSDs in CO_2-equivalent terms across the emitted fluorinated GHGs, using a default GWP of 2000 for fluorinated GHGs that do not have GWPs in Table A-1. In the proposed rule, facilities would have had to calculate a separate RSD for any fluorinated GHG that did not have a GWP in Table A-1. As observed by many commenters, it is easier to achieve an RSD below a given level across gases than it is to achieve this for any particular gas, particularly if the gas makes up a relatively small fraction of the total emitted mass. Second, we are adopting numerous changes to the rule to increase its flexibility, including allowing use of engineering calculations and assessments to estimate emissions for all batch process vents, regardless of emission level, and changing the manner in which emissions from continuous process vents are calculated for comparison to the 10,000 $mtCO_2e$ threshold. These changes are discussed in more detail in the preamble and in the response to comment number EPA-HQ-OAR-2009-0927-0085.1, excerpt 55.

Moreover, the uncertainty estimated by one facility for its emissions estimates using the emission factor approach (about 25 percent), which accounted for process variability, implies that the RSD of the three runs will rarely exceed fifteen percent.[4]

In summary, we expect that despite the change to the RSD, the final rule will rarely, if ever, require facilities to perform additional testing that they would not have been required to perform under the proposal. However, where such additional testing may be required, it will be justified

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[1] The mass-balance error limits also include an absolute error limit, but that is not relevant to the large processes that would be required to perform stack testing under the emission factor approach.

[2] Technical Support Document for Emissions from Production of Fluorinated Gases, Proposed Rule for Mandatory Reporting of Greenhouse Gases. U.S. Environmental Protection Agency, March 22, 2010.

[3] For emissions that showed an RSD of 20 percent after three measurements, the requirement that three more measurements be taken would reduce the uncertainty of the emission factor from 50 percent to 21 percent.

[4] Alternatively, the facility may have performed additional testing when it did.

by the significant improvement in the accuracy and precision of the resulting emission estimate for the process vent.

Commenter Name: Jeff C. Muffat
Commenter Affiliation: 3M Center
Comment Number: EPA-HQ-OAR-2009-0927-0111.1
Comment Excerpt Number: 15

Comment: §98.124 (c)(1), Process Vent Testing. The section requires testing at five year intervals. 3M requests that EPA eliminate any specific testing frequency. As a practical matter and for a variety of reasons, 3M measures many of its major continuous processes at this frequency, but we feel it would be more appropriate to either extend this frequency to 10 years or only when major process changes occur. In EPA's request for comments, they have suggested that a possible alternative would be to require measurement only when emissions deviated by 15% (as a fraction of the current emission). 3M supports this approach with the following recommendations:

1. Measurement is not required when emission changes can be reasonably predicted using engineering calculations and/or other process information. The requirement to retest processes would appear to be particularly punitive when the resulting change has decreased emissions.
2. An additional consideration would be the use of a thermal treatment device to treat process emissions. In the case of controlled sources, process changes would likely have little impact on the ultimate emissions from the process. We would suggest exempting process changes that fall into this category.
3. Retesting only when monitoring of process yields indicates a statistically significant decrease in process yield unless this yield loss is associated with known losses of liquid and solid byproducts.

Response: In response to this and other comments noting that process vent testing should be repeated every ten years or when significant changes are made to the process, we are requiring that process vent testing be repeated every ten years or when a change (or series of changes) to the operating scenario changes the emission calculation factor by 15 percent or more. The requirement to retest when the emission calculation factor changes by 15 percent or more will ensure that the emission factor will promptly reflect significant, deliberate changes to the operating scenario. The 10-year testing cycle will address successive small changes to the process that may not individually constitute deliberate changes to the operating scenario (and may not, in fact, have been noticed), but that may nevertheless cumulatively affect the emission factor.

In the April 2010 re-proposed rule, we proposed to require retesting every five years. However, we requested comment on the options of extending the five-year retest period to ten years and triggering new emission factor measurements when changes to other process parameters, such as process yields, implied that the emission factor had changed by 15 percent or more . Commenters generally supported these options.

When changes to the operating scenario change the emission calculation factor by 15 percent or more, we believe that retesting, rather than recalculation or adjustment, of emission factors is appropriate. A 15-percent change in the emission calculation factor implies that the change to the operating scenario is significant. Significant changes to (or differences between) operating scenarios can lead to changes to both the magnitudes (i.e., CO_2e) and mixtures (i.e., proportions of different fluorinated GHGs) of emissions, and not all of these changes are likely to be predictable from emission calculations. (One change that is predictable is a change that is due to the application of a destruction device to the emissions; in this case, the rule does not require retesting.) This concern exists regardless of whether emissions are expected to be decreased or increased by the change; the goal of this regulation is a reasonably accurate emissions estimate in either situation.

Regarding retesting of emissions streams that are destroyed, the rule now requires facilities to evaluate controlled emissions, rather than uncontrolled emissions, to make the initial determination of whether emissions from the process vent exceed 10,000 $mtCO_2e$ and therefore must be tested in the first place. If controlled emissions exceed 10,000 $mtCO_2e$, then a 15-percent change to these emissions is significant and warrants retesting regardless of the destruction device.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 47

Comment: The emission factor testing frequency provisions at proposed §98.124(c)(1) represent a substantial improvement from the 2009 proposal. A five-year testing frequency (absent process changes) is appropriate for the first five-year period after Subpart L implementation. However, after obtaining significant experience with tracking and recording actual FGHG emissions, reporting facilities will likely develop adequate systems to fully document and verify FGHG emissions and DRE without conducting full testing protocols every five years. Reporters are already required to verify emissions calculations every five years at proposed §98.124(d)(1). EPA should provide a "skip schedule" for testing of processes that do not change over time. For consistently operated processes, every ten years is appropriate for performing this test protocol, once the reporter has established the appropriate baseline. EPA should allow reporters to certify every other testing cycle that the prior five-year source test adequately represents current FGHG emissions and DRE performance. Under this proposal, a reporter would not be required to test except for once every ten years, so long as the facility did not meet the process change criteria at any point in the prior ten years. EPA should provide a mechanism for reporters to verify process performance for a five-year period in lieu of testing if no process changes have occurred in a specific reporting process unit.

Response: We agree with the commenter that a 10-year frequency for conducting emission testing for emission factor development is appropriate and have revised the testing frequency requirement in the final rule. In addition, we have clarified the circumstances under which a change (or series of changes) to an operating scenario triggers additional testing or calculation.

Under §98.124(c), the final rule requires that if the emission calculation factor for the changed operating scenario is 15 percent or more different from the emission calculation factor for the tested operating scenario, then the facility must retest to update the emission factor. The 15 percent difference is cumulative since the last emission factor developed by emission testing. Under §98.124(d), facilities must update the emission calculation factor if a change to the operating scenario is expected to change the process-vent-specific emission calculation factor.

Please see the response to comment number EPA-HQ-OAR-2009-0927-0111.1, excerpt 15 for more discussion of this issue.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 48

Comment: EPA should further clarify that the §98.124(d)(1) FGHG emissions verification process does not necessarily require a full reconstruction of the reporting basis. The introductory language §98.124(d)(1) implies that reporters are required to "[r]evise the emission calculation for each process every 5 years." Revision is not necessary for process units not undergoing process changes. Likewise, if a reporter can document that the emissions basis of an alternate operating scenario is identical to an existing operating scenario, the §98.124(d)(2) separate operating condition emission factor requirement may not be necessary. EPA should clarify that separate emission factors are only necessary when the value of the emission factor is either significantly less than, or is greater than, the base emission factor.

The "representative performance" testing criteria properly reflects actual emissions testing. This criterion allows reporters to document the substantial emissions sources without the need to document the rare maintenance activities that do not significantly contribute to actual FGHG emissions.

Response: We agree with the commenter that frequent updates are not necessary for process units not undergoing process or operating scenario changes or modifications. In the final rule, we are requiring that emission calculation factors be updated when operating scenario changes are expected to affect them. Otherwise, there is no requirement to recalculate emission calculation factors (i.e., there is no separate minimum frequency of recalculation). Because facilities are already required to recalculate factors when they make deliberate changes to the operating scenario that will affect the factors, and because facilities cannot, by definition, recalculate factors to reflect changes of which they are not aware, a minimum frequency of recalculation is not likely to improve emission calculation factors.

Regarding the calculation of different emission calculation factors for different operating scenarios, as discussed in the response to comment EPA-HQ-OAR-2009-0927-0111.1, excerpt 26, different sets of equipment that make the same product, if they are identical, may be considered the same operating scenario. In this situation, an emission calculation factor developed for one production line may be applied to the other. In situations where the equipment or other aspects of the operating scenarios differ slightly, the facility would need to perform engineering calculations or assessments to demonstrate the similarity between the scenarios before applying the emission calculation factor developed for the first to the second. At this point, the facility would have done the work to develop a second emission calculation factor. Thus, it is not clear what the facility would gain by applying the factor for the first operating scenario to the second.

EPA agrees that the emission factor should be based on representative operation of the process. In general, the emission factor should not include startup or shutdown events unless the emission testing occurs over a long enough period that including these events would not inadvertently bias the emission factor result. We would like to note however that in §98.124(j), the rule requires that facilities account for startup, shutdown, and malfunction events for the process in the annual emission estimate, or else confirm that these events do not significantly affect the annual emission estimate. For example, if a periodic disturbance occurs in the process, and this occurs on a fairly frequent basis, the emissions from each event could be estimated and summed in the annual emission estimate. The emissions for each event could be determined separately, or in some instances, something along the lines of an emission calculation factor for the disturbance event could be determined. It is likely that process malfunction events will be random and the magnitude of emissions will vary, although industry has noted that emissions from startup, and perhaps shutdown events too, are fairly consistent from one event to another.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 39

Comment: EPA should further clarify the relationship between §98.126(f)(6) testing requirements and reporter’s use of updated emission factors. Reporters may update emission factors based on process design documents quickly, even before the process change takes place. These pre-startup calculations may even show that no EPA process change will take place for a specific project. The lag time between startup and testing, including production of the test report, could take several months. EPA should encourage reporters to utilize updated emission factors upon startup of process changes, require reporters to utilize §98.123 methodology to determine if a process change occurs before the reporter implements any significant process modifications, and should allow reporters 90 days after submitting a test report to either validate or update emission factors. Reporters making process changes that do not increase actual FGHG emissions, using traditional CAA definitions, should not be required to retest or restate emission factors. EPA’s 15% suggestion at 75 Fed. Reg. 18678/3 appropriately balances the need to adjust emission factors and the need to not expend large costs to document trivial FGHG emission rate changes. These emission factor streamlining steps better allow reporters to adjust their reporting systems for process changes, while allowing use of best engineering practices to evaluate when further testing is required.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0111.1, excerpt 15. We have clarified in the final rule that, for emission factor updates that are made due to an operating scenario change, the emission testing required to update the emission factor must be conducted by February 28 of the year following the change or modification. We have also clarified that the updated emission factor must be applied to the process activity that occurs after the operating scenario change. Together, we believe that these provisions will allow sufficient time to conduct the testing while ensuring that the change to the emission factor is promptly and appropriately reflected in the facility's emissions estimate. For emission factor updates that are made due to the passage of ten years since the previous measurement, the updated emission factor must be applied to the process activity that occurs after the most recent measurement.

Note that EPA has not included requirements to submit actual emissions test reports to the Agency under this subpart. However, EPA is requiring that facilities retain records of emissions test reports (including revised reports). The emissions test report must contain all information and data used to derive the process-vent-specific emission factor, as well as key process conditions during the test.

Commenter Name: Brian R. Keck
Commenter Affiliation: Air Products and Chemicals, Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0106.1
Comment Excerpt Number: 20

Comment: In [section] B. Fluorinated Gas Production, Section 5.d. [of the re-proposal preamble], EPA requests comment on whether previously measured emission factors whose measurement departed in some particulars from the requirements of the rule but still substantially met most of the requirements, making it likely that the emission factors were representative, could be used if the facilities provided information to EPA on the areas where measurements departed from the requirements of the rule for EPA review and verification. Air Products supports this alternative approach to prescriptive test methods and the additional costs associated with conducting unnecessary tests.

Response: EPA appreciates your comment regarding use of previous emissions testing that meets the requirements of the rule. We are allowing facilities to use previous measurements to develop emission factors as long as those measurements meet the testing requirements in §98.124(c) and the method requirements in §98.124(e), and as long as the measurements were made less than ten years before the effective date of the rule. We have determined that these requirements allow a reasonable degree of flexibility while ensuring that the resulting emission factors are precise and accurate. As discussed in the preamble, we have included additional flexibility at §98.124(e) to select appropriate, validated sampling and analytical methods (including validated, industry-accepted methods). As discussed in the preamble and elsewhere in this response to comments document, we have designed the emission test requirements to result in accurate and robust emission factors. (See, for example, the response to comment number EPA-HQ-OAR-2009-0927-0085.1, excerpt 27.) The requirement that the measurements be no more than 10 years old is consistent with the measurement frequency established for emission factors elsewhere in subpart L; the final rule requires that emissions factors be redeveloped every 10 years. For use of previous emissions tests in general, the date on which the previous emission testing was conducted begins the 10-year re-measurement cycle.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 34

Comment: Consolidated Control Devices. EPA requires reporters operating manifolded FGHG control devices to run three one-hour test runs for each contributing process at proposed §98.124(c)(6), rather than three one-hour runs for the composite flow into the control device. Arkema routes multiple emissions units into Calvert City facility emission controls systems. We expect that this proposal alone would cost the Calvert City facility between $150,000 and $200,000 per testing cycle, assuming proposed testing requirements. Reporters must, in the scoping test process, document the expected emissions contributions from each reporting process unit. Reporters can use this analysis to allocate FGHG emissions among contributing processes to a control device and avoid the expense of separate testing. EPA should provide a testing alternate that allows facilities to evaluate total tested FGHG load to a control device, determine if the scoping test analyses predict total control device loading to within 20% of the observed tested amount, and determine if further testing of individual contributing process units is needed to document the control device FGHG loading. Allowing reporters to utilize the scoping test to optimize testing would likely save Arkema over $100,000 per testing cycle.

Response: EPA has revised the requirements for sampling of manifolded process vents to a destruction device. The requirement to conduct 3 test runs for each process vent sent (i.e., the "3n" test runs) to the destruction device has been deleted from the final rule text. We would like to note, however, that for sampling with multiple process vents manifolded together, facilities would be required to meet the RSD of 0.15, so potentially up to 6 test runs may be required.

An additional alternative with respect to sampling of manifolded process vents has been included in the final rule. As in the April 2010 proposed rule, facilities may sample the process vent before the manifold or while a single process is operating. The alternative approach included in the final rule allows a facility to operate multiple processes and sample the manifolded process vents. The facility may conduct emission calculations for each of the individual process vents using the same methods used to estimate emission calculation factors in §98.123(c)(4). The sum of these emission calculations by process vent and process must be compared with the emissions determined during testing. If the sum of the emissions determined by calculation is within 20 percent of the emission testing value, the facility may apportion the emissions to each process vent and develop an emission factor for each process vent on this basis.

Section 5.3.4 - Accuracy and Precision for Process Activity

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 49

Comment: Reporters document a variety of process activity variables for a number of existing Clean Air Act obligations. EPA should clarify at proposed §98.124(c)(5) that parameters already used for other Clean Air Act compliance obligations will be managed in the manner required by the underlying permit or regulatory condition. All post-1990 EPA emission standards at 40 CFR 60, 63, and 64 require adequate data accuracy protocols to document monitoring integrity. EPA should rely on existing Clean Air Act authorities when possible to avoid redundant, overlapping, or conflicting instrument and/or data management obligations.

Response: While EPA appreciates the commenter's suggestion to rely on existing CAA obligations, we are establishing precision, accuracy, and calibration requirements in this final rule to ensure that emission estimates developed under this rule are reasonably accurate and precise. Specific accuracy, precision, and calibration requirements may vary among regulatory programs depending on how the measurements are used. Please see response 1-b in the Response to Comments Document for Cross-Cutting Comments for more discussion of this issue. For an additional example, even within subpart L, we are establishing different accuracy and precision requirements for measurements that are used to develop estimates using the mass-balance approach and for measurements that are used to develop estimates under the emission factor approach. These differences are driven by the mathematical differences between the two approaches. Because the mass-balance approach estimates emissions based on a small difference between large quantities (i.e., the masses of reactants and products), highly precise and accurate measurements of those quantities are required to yield an estimate of emissions whose accuracy and precision are comparable to those of an estimate developed using the emission factor approach based on less precise measurements. The rule's various accuracy and precision requirements are discussed further in the preamble to the rule and elsewhere in this Response to Comments document (see e.g., the responses to comment number EPA-HQ-OAR-2009-0927-0084.1, excerpt 4; comment number EPA-HQ-OAR-2009-0927-0104, excerpt 3; and comment number EPA-HQ-OAR-2009-0927-0128.1, excerpt 15).

Section 98.124(c)(3) [formerly §98.124(c)(5) in the April 2010 proposed rule] requires that activity data used to develop emission factors and to estimate emissions under the emission factor approach be measured using flow meters, weigh scales, or other measurement devices with an accuracy and precision of ±1 percent of full scale or better. These accuracy and precision requirements are the same as those required for mass measurements under subpart OO, which were established based on comments from fluorinated GHG producers. If facilities have monitoring instruments in place that meet the 1 percent requirement, these instruments may continue to be used. Under §98.124(m), facilities are required to initially and periodically calibrate their mass measurement devices using consensus standards listed in subpart L or other calibration procedures recommended by the manufacturer. Recalibrations are required to occur at the frequency recommended by the device manufacturer. We anticipate that the revised provisions that allow use of consensus methods and manufacturer-recommended methods and frequency will provide adequate flexibility for facilities to coordinate the requirements of this rule with those of other regulatory programs.

Commenter Name: Lorraine Krupa Gershman
Commenter Affiliation: American Chemistry Council
Comment Number: EPA-HQ-OAR-2009-0927-0092.1
Comment Excerpt Number: 26

Comment: We support EPA's proposal allowing for monthly sampling. We also support EPA's proposal in §98.124(d)(3) to allow for an accuracy and precision of ±1 percent for process activity measurements.

Response: EPA appreciates your comment and support. We would like to note that the monthly sampling the commenter refers to is for the mass balance approach. For the mass balance approach, the monthly sampling requirement is a minimum; facilities may need to sample processes with variable concentrations more frequently to ensure that they meet the relative and absolute error criteria. (In the variant of the mass-balance approach that establishes specific precisions, accuracies, and frequencies for measuring mass flows and concentrations, sampling must be conducted weekly.)

The accuracy and precision requirements in §98.124(d) to which the commenter refers are related to the activity data used to develop emission calculation factors and to estimate emissions using emission calculation factors. Similar accuracy and precision requirements at §98.124(c) apply to the development and use of emission factors. We have concluded that these requirements will result in emission estimates of reasonable accuracy and precision using the emission factor and emission calculation factor approaches. However, as discussed in the response to comment number EPA-HQ-OAR-2009-0927-0104, excerpt 3, we have concluded that, under the mass-balance approach, an accuracy and precision of this level would result in emission estimates with high relative errors.

For more discussion of sampling frequency under the mass-balance approach, please see the preamble of the final rule and the response to comment number EPA-HQ-OAR-2009-0927-0128.1, excerpt 15.

Commenter Name: John Dege
Commenter Affiliation: DuPont
Comment Number: EPA-HQ-OAR-2009-0927-0103.1
Comment Excerpt Number: 23

Comment: Section 98.124(d)(3) states: Use flow meters, weigh scales, or other measurement devices or instruments with an accuracy and precision of plus or minus 1 percent full scale or better for monitoring ongoing process activity." Section 98.124(b) states: "If you determine fluorinated GHG emissions using the mass balance method under §98.123(a), you must estimate the total mass of each fluorinated GHG emitted from the process at least monthly. DuPont supports monthly sampling and 1% accurate measurement devices.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0092.1, excerpt 26.

Section 5.4 - Allow Alternative Sampling and Analytical Methods (MB and process vents)

Commenter Name: Jeff C. Muffat
Commenter Affiliation: 3M Center
Comment Number: EPA-HQ-OAR-2009-0927-0111.1
Comment Excerpt Number: 30

Comment: Section 98.124 (b)(4)(v) and (vi) lists specific test methods and the preamble language has indicated that constituents present at concentrations of 0.1% or greater must be quantified. 3M has met this performance requirement on some of its major vent emissions. Using FTIR (EPA Method 320) and GC/MS (TO-15), we have been able to identify and quantify (with standards) as much as 99.7% of certain vent gas streams. We have had the capability to identify compounds that comprised as little as 0.002% of the total vent stream.

However, there are process vent streams in which characterization at the 0.1% level will not be possible. Due to reactions occurring in some batches processes, there is greater complexity in these vent gas streams. There is greater potential for the presence of unknown compounds for which certifiable standards do not exist. The listed test methods require the use of certifiable standards. Therefore additional analytical methods and procedures, such as the use of surrogate calibration compounds, are required to address this issue. We are recommending that the language that was developed as a part of the Subpart OO discussion be incorporated into this section. It is provided below:

“Analytical Methods. Use a quality-assured analytical measurement technology capable of detecting the analyze of interest at the concentration of interest and use a procedure validated with the analyze of interest at the concentration of interest. Where standards for the analyze are not available, a chemically similar surrogate may be used. Acceptable analytical measurement technologies include but are not limited to gas chromatography (GC) with an appropriate detector, infrared (IR), fourier transform infrared (FTIR), and nuclear magnetic resonance (NMR). Acceptable methods include EPA Method 18 in Appendix A-I of 40 CFR part 60, EPA Method 320 in Appendix A of 40 CFR part 63, the Draft EPA DRE Protocol, ASTM D6348-03 (incorporated by reference in §98. 7), or other analytical methods validated using EPA Method 301 or some other scientifically sound validation protocol. The validation protocol may include analytical technology manufacturer specifications or recommendations.”

3M does not believe that this will have a significant impact on our emission estimates. We have the capability of positively identifying and quantifying a high percentage of our emissions. When unknowns have been present, their GWP values have been estimated using the weighted average of the known compounds that are present. We have verified these assumptions with process knowledge, historical information, and other analytical information. In most cases, unknown compounds will have structural similarities with those that have been positively identified, and we expect GHG’s to be comparable.

In addition to the language provided above, EPA should include both EPA Method TO-15 and EPA TO-14a. Both methods allow for samples to be collected in canisters. In many fluorochemical manufacturing processes, canisters are easier and safer than tedlar bags. EPA method TO-14a also allows for the use of multiple detectors which will be helpful for these matrices.

Response: The commenter requests that EPA allow facilities to use sampling and analysis methods other than EPA's emission testing reference methods. As discussed in the preamble of the final rule, EPA agrees that additional flexibility is appropriate and is allowing facilities to use alternative test methods and procedures to identify and quantify fluorinated GHGs in process and emissions streams. The sampling and analytical requirements that we are incorporating into subpart L are very similar to those that would be required under §98.414(n) in the proposed amendments to subpart OO (75 FR 48744; August 11, 2010). The revised requirements allow facilities to conduct validated sampling and analysis methods using appropriate analytes or surrogates. These alternative methods and procedures must be validated and documented in the facility's GHG Monitoring Plan. EPA has concluded that this change will provide the flexibility necessary to allow facilities to develop and apply new analytical procedures that may be required to identify and quantify all of the fluorinated GHGs in process and emissions streams. At the same time, the quality assurance, validation, and documentation requirements for analytical procedures will assure that facilities are able to obtain and report accurate emissions measurements.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 13

Comment: EPA should further clarify that any testing that may be required for process vent emissions best described by wastewater calculation methods need to conform to the process vent realities. Typically, reporters use WATER9 type models to describe emissions from aqueous systems in conveyances other than hard piped systems. A number of these systems exist in the fluorochemical manufacturing industry, including weak acid handling systems. Such systems may contain FGHGs, and some of those FGHGs could potentially become emitted. The appropriate testing for such a system consists mostly of EPA wastewater methods in publication SW-846. Typical source testing programs based on Method 18 typically require higher airborne concentrations, typically over between 1 and 20 parts per million by volume ("ppmv"), to detect compounds of interest. Directly measuring liquid FGHG concentrations in such an aqueous stream, and calculating actual emissions from liquid analyses, provides more accurate and verifiable emissions calculations in these aqueous systems. We recommend that EPA provide adequate testing flexibility to fully document the variety of aqueous process vent systems, and FGHG emissions from those systems, in the fluorochemicals industry.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0111.1, excerpt 30.

Commenter Name: Lorraine Krupa Gershman
Commenter Affiliation: American Chemistry Council
Comment Number: EPA-HQ-OAR-2009-0927-0092.1
Comment Excerpt Number: 15

Comment: The testing protocols prescribed in §98.123(b)(4) do not allow for the development of site-specific protocols, nor do they allow for a change in protocols by the facility. We believe that the testing protocol language in the Miscellaneous Organic Chemical Manufacturing National Emission Standard for Hazardous Air Pollutants (NESHAP) (MON) (40 CFR 63.2450(g)) would have been sufficient with respect to testing. These protocols are already known and used by the chemical industry, and as such, would reduce the burden on reporting facilities.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0111.1, excerpt 30.

Commenter Name: Jeff C. Muffat
Commenter Affiliation: 3M Center
Comment Number: EPA-HQ-OAR-2009-0927-0111.1
Comment Excerpt Number: 4

Comment: 6. The analytical methods that are used for Subpart L should be modeled after the language that was developed during the Subpart OO settlement process.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0111.1, excerpt 30.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 32

Comment: EPA proposes at proposed §98.124(c)(4)(vi) to require reporters using alternate source testing methods to implement Method 301 as a method validation protocol. DEECO, Inc., one of Arkema's primary stack testing contractors informed us that the cost of running a single day of Method 301 compliant testing is $10,000, as opposed to around $3,000 per day of standard Method 18 based source testing. EPA should only require Method 301, or other acceptable test acceptance criteria methods, to be performed during the first testing program using a new method. EPA should not require reporters to incur unnecessarily expensive testing protocols once a method has been proven reliable.

Response: By allowing additional methods and analytical techniques to be used, as described in the final rule, EPA generally expects to reduce the economic burden placed on facilities. It was not EPA's intent to require a Method 301 validation test for a method every time an alternative method is used; a facility may conduct the Method 301 (or other scientifically sound) validation the first time the alternative method is used for the analyte(s) of interest at the concentration(s) of interest, and then use the alternative method for the next testing requirement for those analytes and concentrations. A facility would not be required to re-validate a method for the same set of analytes and concentrations.

Method 301 includes optional procedures that may be used to expand the applicability of the alternative analytical method. Section 7.0 involves ruggedness testing (Laboratory Evaluation), which demonstrates the sensitivity of the method to various parameters. Section 8.0 involves a procedure for including sample stability in bias and precision for assessing sample recovery and analysis times; Section 9.0 involves a procedure for the determination of the practical limit of quantitation for determining the lower limit of the method. These optional procedures are required for the waiver consideration outlined in Section 12.0 of Method 301. Although we are not incorporating such a waiver process in subpart L, §98.124(e)(3) requires a description of the validation protocol used to validate the alternative analytical methods. This would include a description of any methods used to expand the applicability of the alternative analytical method, such as those in sections 7.0, 8.0, and 9.0 of Method 301.

[Where did this move to?]**Commenter Name:** John Dege
Commenter Affiliation: DuPont
Comment Number: EPA-HQ-OAR-2009-0927-0103.1
Comment Excerpt Number: 30

Comment: Section 98.124(c)(4)(v) limits industry standard detection devices. EPA: Section 98.124(c)(v) states: “Use EPA Method 18 (with GC and either Mass Spec (MS) or Electron Capture Detector (ECD)”. Comment: Industry standard analytical practices use detectors other than MS or ECD.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0111.1, excerpt 30.

Commenter Name: Lorraine Krupa Gershman
Commenter Affiliation: American Chemistry Council
Comment Number: EPA-HQ-OAR-2009-0927-0092.1
Comment Excerpt Number: 29

Comment: The analytical methodologies set forth in the proposed rule are overly prescriptive and limit industry standard detection devices. Section 98.124(c)(4)(v) & (vi) states:

(v) Fluorinated GHG concentrations. Use EPA Method 18 (with GC and either MS or ECD) in Appendix A–1 of 40 CFR part 60; EPA Method 320 in Appendix A of 40 CFR part 63; Draft EPA DRE Protocol; or ASTM D6348–03 (incorporated by reference in §98.7).

(vi) Alternative fluorinated GHG concentration methods. Alternatives that may be used for determining fluorinated GHG concentrations include EPA TO–15 or other alternative test methods conducted in conjunction with EPA Method 301 for validation.

The EPA methods, such as EPA TO-15, do not work well for fluorocarbons. Industry standard analytical practices use detectors other than MS or ECD. ECD is not as sensitive to fluorine as FID, for example.

We urge EPA to allow for the use of generally accepted analytical measurement technologies, including but not limited to gas chromatography with an appropriate detector, nuclear magnetic resonance, infrared, etc. We also believe that any acceptable analytic method validated using EPA Method 301 or another scientifically sound validation protocol (including manufacturer specifications or recommendations) should be allowed.

Whatever analytical measurement technologies and analytical methods are used should be documented and described in the facility's GHG Monitoring Plan required under §98.3(g)(5) of the rule.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0111.1, excerpt 30.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 33

Comment: Proposed §98.124(c)(4)(v) requires reporters to utilize a Method 18 (40 CFR 60 Appendix A) method to evaluate FGHG concentrations. However, Method 18 does not allow use of Summa canisters for sample collection, instead requiring use of Tedlar® bags. DEECO reported to Arkema that SUMMA canisters provide superior Method 18 performance to Tedlar bags, especially when evaluating complex chemistry like FGHGs. EPA should indicate in proposed §98.124(c)(4)(v) that an appropriate sample collection system shall be used, including direct injection, Tedlar bags or equivalent, and Summa canisters or equivalent. Other methods may emerge as appropriate as the reporting community conducts the first round of FGHG testing in 2011. EPA should provide a mechanism allowing reporters to modify test methods to adapt to emerging realities that will become evident during testing.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0111.1, excerpt 30.

Commenter Name: John Dege
Commenter Affiliation: DuPont
Comment Number: EPA-HQ-OAR-2009-0927-0103,1
Comment Excerpt Number: 31

Comment: Analytical methodologies are overly prescriptive. EPA: Subpart L at 124(c)(4)(v) & (vi) says:

"(v) Fluorinated GHG concentrations. Use EPA Method 18 (with GC and either MS or ECD) in Appendix A–1 of 40 CFR part 60; EPA Method 320 in Appendix A of 40 CFR part 63; Draft EPA DRE Protocol; or ASTM D6348–03 (incorporated by reference in §98.7).
(vi) Alternative fluorinated GHG concentration methods. Alternatives that may be used for determining fluorinated GHG concentrations include EPA TO–15 or other alternative test methods conducted in conjunction with EPA Method 301 for validation."

Comment: The EPA methods, such as EPA TO-15 as written don't work well for fluorocarbons. ECD is not as sensitive to fluorine. The following is suggested:

"(v) Analytical Methods. Use a quality-assured analytical measurement technology capable of detecting the analyte of interest at the concentration of interest and use a procedure validated with the analyte of interest at the concentration of interest. Where standards for the analyte are not available, a chemically similar surrogate may be used. Acceptable analytical measurement technologies include but are not limited to gas chromatography (GC) with an appropriate detector, infrared (IR), fourier transform infrared (FTIR), and nuclear magnetic resonance (NMR). Acceptable methods include EPA Method 18 in Appendix A-1 of 40 CFR part 60, EPA Method 320 in Appendix A of 40 CFR part 63, the Draft EPA DRE Protocol, ASTM D6348-03 (incorporated by reference in §98. 7), or other analytical methods validated using EPA Method 301 or some other scientifically sound validation protocol. The validation protocol may include analytical technology manufacturer specifications or recommendations.
(vi) Documentation in GHG Monitoring Plan. Describe the analytical method(s) used under paragraph (n) (1) in the site GHG Monitoring Plan as required under §98.3 (g) (5) of this part. At a minimum, include in the description of the method, a description of the analytical measurement equipment and procedures, quantitative estimates of the method's accuracy and precision for the analytes of interest at the concentrations of interest, as well as a description of how these accuracies and precisions were estimated, including the validation protocol used."

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0111.1, excerpt 30.

Commenter Name: Dave Stirpe
Commenter Affiliation: Alliance for Responsible Atmospheric Policy
Comment Number: EPA-HQ-OAR-2009-0927-0117.1
Comment Excerpt Number: 12

Comment: Detection of fluorinated greenhouse gases in plant environment at the precision required does not exist in many cases. Reporting facilities may need to develop customized fugitive and stack emissions testing protocols not fitting the prescribed EPA test methods proposed in Subpart L. EPA should provide a mechanism for reporting facilities to resolve emerging technical issues that may not fit existing procedures.

Response: Please see the responses to comment number EPA-HQ-OAR-2009-0927-0111.1, excerpt 30 and to comment number EPA-HQ-OAR-2009-0927-0111.1, excerpt 1.

Section 5.5 - Calibration Standards

Commenter Name: Lorraine Krupa Gershman
Commenter Affiliation: American Chemistry Council
Comment Number: EPA-HQ-OAR-2009-0927-0092.1
Comment Excerpt Number: 31

Comment: Section 98.124(l) calls for monthly calibration of all analytical equipment. Preparation of new controls over the full range of calibrated components for each test on such a frequency would be prohibitive from both a cost and manpower basis. Historically, an annual calibration check has proven to be sufficient to achieve accuracy levels equivalent to those specified in EPA methods.

In most cases certified calibration standards are not available for our products. In those cases where they are not, there are generally three methods that are used:

1. Gravimetrically mixing known amounts of pure individual chemical species;
2. If pure individual chemical species are not available, process material (product) are collected and held as a historical reference against which instrument response is checked for stability; or
3. If neither pure chemical nor product is available, then surrogates can be used.

The protocol involves gravimetric measurement of known amounts of the chemical as noted above, diluted to appropriate concentrations.

We urge EPA to allow facilities to calibrate analytical frequency as needed to support the requisite analysis. The calibration frequency and method should be documented and described in the facility's GHG Monitoring Plan required under §98.3(g)(5) of the rule.

Response: The monthly calibration requirement from the re-proposal rule for analytical equipment has been revised to require a calibration frequency and method that supports the validated analytical method chosen by the facility. When certified calibration standards are not available, which commenters have noted is common for fluorinated GHGs, facilities may use mixtures of pure individual chemical species, process material, or a chemically similar surrogate compound for the calibration event. This is the typical and accepted practice for many fluorinated GHGs. The calibration frequency and method must be specified and explained in the facility's GHG Monitoring Plan.

Commenter Name: Joel R. Hall
Commenter Affiliation: Mexichem Fluor Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0104
Comment Excerpt Number: 8

Comment: Certified standards for refrigerant gases and associated impurities are not available. §98.124(l) requires that certified standards be used in the calibration of all analytical equipment used to determine the concentration of fluorinated GHGs. §98.124(a) requires an initial scoping study to identify all fluorinated GHGs that may be generated from processes subject to Subpart L and that have uncontrolled emissions of 1.0 metric ton or more of fluorinated GHGs. The paragraph further requires that the scoping study must be performed on the streams that would be expected to contain all fluorinated GHG by-products of the process. Therefore, as proposed, no fluorinated GHGs are exempt from being identified using one of the analytical methods listed in §98.124(c)(4)(v).

Mexichem's laboratory has not found a source for certified refrigerant gases (product or impurity). Standards are made in Mexichem's on-site laboratory by diluting pure product (obtained from a third-party laboratory) to the applicable concentration.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0092.1, excerpt 31.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 56

Comment: EPA proposed a limited number of testing options at proposed §98.124(k). Some of these methods may or may not be appropriate for the number and types of vents that may need to be sampled, based on the scoping test results to be developed in calendar year 2011. Arkema understands that EPA is developing alternate testing language for other Part 98 subparts that may provide sufficient flexibility. Technical issues that may arise include conflicts between §98.124(k) American Society for Mechanical Engineers ("ASME") calibration methods and instrument appropriate calibration methods, listed §98.124(c)(4) test methods in lieu of preferred EPA 40 CFR 60 Appendix A (or other EPA) test methods, technical limitations that govern the use of specific detection technology for some target FGHGs outside of the proposed testing limitations, and the lack of certified standards for some target FGHGs as required in proposed §98.124(l). Absent a testing protocol process for reporters to coordinate testing with EPA, Subpart L should include a methodology for reporters to utilize alternate test methods when required. EPA should also evaluate testing and analytical equipment performance requirements in Subpart OO in effect when Subpart L compliance begins to harmonize testing obligations between these two fluorochemical subparts.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0111.1, excerpt 30.

As proposed, the final rule allows use of either the listed consensus standard calibration methods or calibration methods recommended by the flow meter, weigh-scale, or other volumetric or density measure manufacturer. We have concluded that this allows ample flexibility while ensuring that measuring devices are appropriately calibrated. Regarding harmonization with subpart OO, EPA has modified the testing requirement language such that it is more closely aligned with the proposed amendments to subpart OO and provides the same flexibility.

Commenter Name: John Dege
Commenter Affiliation: DuPont
Comment Number: EPA-HQ-OAR-2009-0927-0103,1
Comment Excerpt Number: 37

Comment: Section 98.124(l) Instrument calibration frequency is excessive. EPA: Proposed section 98.124 (l) states:

"(l) All analytical equipment, including gas chromatographs, GC/MS, GC/ECD, FTIR and NMR devices, used to determine the concentration of fluorinated GHG in streams shall be calibrated at least monthly through analysis of certified standards with known concentrations of the same chemicals in the same ranges (fractions by mass) as the process samples. Calibration gases prepared from a high-concentration, certified standard using a gas dilution system that meets the requirements specified in Method 205, 40 CFR Part 51, Appendix M may also be used."

Comment: Preparation of new controls over the full range of calibrated components for each test on such a frequency would be prohibitive from both a cost and manpower basis. Historically, an annual calibration check has proven to be sufficient to achieve accuracy levels equivalent to those specified in EPA methods. If standards can be used as described below (typically using standards that were prepared previously) monthly calibration might be more reasonable. In most cases certified calibration standards are not available for our products. In those cases where they are not, there are generally three methods:

1. gravimetrically mixing known amounts of pure individual chemical species
2. where pure individual chemical species are not available, process material (product) are collected and held as a historical reference against which instrument response is checked for stability
3. if neither pure chemical nor product are available, then surrogates can be used.

The protocol involves gravimetric measurement of known amounts of the chemical noted in #1, 2 or 3, above, diluted to appropriate concentrations. The following wording is suggested:

"All analytical equipment used to determine the concentration of FGHGs, including but not limited to gas chromatographs and associated detectors, IR, FTIR and NMR devices, used to determine the concentration of FGHG in streams, shall be calibrated at a frequency needed to support the type of analysis specified in the site GHG Monitoring Plan as required under §124(c)(4) and §98.3 (g) (5) of this part. Quality assurance samples at the concentrations of concern shall be used for the calibration. Such quality assurance samples shall consist of or be prepared from certified standards of the analytes of concern where available; if not available, calibration shall be performed by a method specified in the GHG Monitoring Plan."

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0092.1, excerpt 31.

Commenter Name: Joel R. Hall
Commenter Affiliation: Mexichem Fluor Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0104
Comment Excerpt Number: 11

Comment: Clarify whether the calibration requirements of §98.124(k) apply to equipment used to measure process activity. Under the site-specific process-vent-specific emission factor approach, process activity measurements must be determined using flow meters, weigh scales, or other measurement devices or instruments with an accuracy and precision of ±1 percent of full scale or better. It is not clear whether the calibration requirements of §98.124(k) apply to these devices and/or instruments.

Response: The calibration requirements in §98.124(m) [§98.124(k) in the April 2010 proposed rule] do apply to the monitoring instruments used to measure process activity.

Commenter Name: Joel R. Hall
Commenter Affiliation: Mexichem Fluor Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0104
Comment Excerpt Number: 12

Comment: Clarify whether equipment used under the Best Available Monitoring Methods (BAMM) of §98.124(m) must be calibrated in accordance with the provisions of §98.124(k) and (l). It is not clear whether equipment used under BAMM needs to be calibrated prior to January 1, 2011 and as required throughout the BAMM period.

Response: Under §98.124(o) of the final rule [formerly §98.124(m) in the April 2010 proposed rule], facilities may use the best available monitoring methods between January 1, 2011 and June 30, 2011 without submitting a request. To the extent possible, facilities must meet all requirements specified within subpart L, even while using BAMM. In the event that the best available monitoring method at a particular facility is unable to comply with the calibration requirements specified in §98.124 (m) and §98.124 (n) [formerly §98.124(k) and (l) in the proposed rule], use of an alternative calibration procedure would be appropriate for the duration of time during which that facility was authorized to use BAMM.

Commenter Name: John Dege
Commenter Affiliation: DuPont
Comment Number: EPA-HQ-OAR-2009-0927-0103.1
Comment Excerpt Number: 28

Comment: The section 98.124(b) process measurement devices annual calibration is excessive. EPA: Section 98.124(b)(1)(i) states: "…using the methods and measurements set forth in §98.413(a) and (b) and in section 98.414(a) and (b)." Comment: The mass balance approach requires following the vendor recommended calibration frequency. Some flow meters cannot be calibrated on-line. This could impact up time since in many cases a shutdown is required for calibration. It could take 2 years to calibrate some flow meters based on shut-down frequencies.

Response: The calibration frequency in the final rule has been revised to the frequency recommended by the instrument manufacturer. In order to maintain high data integrity levels, EPA requires that the calibrations be performed on a regular basis. Depending on the instrument manufacturer's recommended frequency, this may or may not coincide with process shutdown periods, but EPA anticipates that the majority of manufacturers have scheduled production and shutdown periods to allow calibration at regular and/or required frequencies. Moreover, EPA anticipates that most manufacturers will have calibrated the instrument (or verified a calibration performed by the instrument manufacturer) before putting it into service.

Section 5.6 - Destruction Device Efficiency Determination

Section 5.6.1 – Destruction Device Testing

Commenter Name: Jeff C. Muffat
Commenter Affiliation: 3M Center
Comment Number: EPA-HQ-OAR-2009-0927-0111.1
Comment Excerpt Number: 17

Comment: §98.124 (f), Destruction device performance testing. We are requesting that the testing frequency be increased to ten years (10) or whenever operation conditions would have been expected to substantively change the expected performance of the destruction device. The thermal treatment devices that may be used to treat process emissions in this source category will utilize process control monitoring that would identify decreases in process performance. We do not expect that the performance of the system will change with time or would change in a manner that would not detected by this type of instrumentation process instrumentation.

Response: We agree with commenter that a 10-year frequency for conducting destruction device performance testing is appropriate and have revised the frequency requirement in the final rule. For substantive changes that may affect the destruction efficiency, the final rule also requires re-testing to determine the revised destruction efficiency. This combined approach reduces the testing burden to facilities while at the same capturing destruction device changes that may occur.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 42

Comment: Second, EPA should clarify that retesting a control device that will continue to meet the appropriate 99.9% or 99.99% DRE need not be retested until the next scheduled five-year testing cycle.

Response: Regarding the frequency of testing, please see the response to comment number EPA-HQ-OAR-2009-0927-0111.1, excerpt 17. Regarding the 99.9 percent destruction efficiency that was included in the April 2010 proposed rule as a criterion for allowing use of emission calculation factors to estimate emissions from process vents, please see the preamble of the final rule.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 35

Comment: Destructability. Proposed §98.124(f) requires reporters to evaluate destructability of identified FGHGs to evaluate controllability of the FGHG stream. Typically, we identify the autoignition temperature ("AIT") of each identified species to set a thermal oxidizer operating temperature. However, not all AIT values for the variety of FGHGs being controlled today, or potentially being controlled in the future, are known at this time. Reporters utilize surrogate compounds to calculate AIT values in designing thermal oxidizer operating parameters based on known combustion chemistry. Surrogates within similar molecular weight, similar bond structure, and similar constituent molecules are appropriate as test proxies. FGHGs follow very specific composition designs of hydrogen, carbon, and fluorine. Similarly structured higher molecular weight molecules tend to have lower AITs, and are more easily destroyed, than smaller similarly structured molecules. EPA should clarify that the §98.124(f)(1) AIT requirement only applies for FGHGs with known AITs. EPA should allow testing verified performance for Subpart L compliance, regardless of how an individual emission control system may have been designed. EPA should also clarify that AIT determination is not necessary for any FGHG comprising less than 0.1% of a combined vent stream because destruction of trace constituents cannot influence DRE.

Response: A response regarding the use of surrogate compounds in destruction device performance testing has been provided in section II.E.3 of the preamble to this rule (see section II.E, Fluorinated Gas Production (Subpart L)).

The final rule has also been modified to exclude gases that occur at or below trace concentrations in streams fed into the destruction device.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 36

Comment: Arkema appreciates EPA's recognition of the interplay between Subpart L and the Hazardous Waste Combustion ("HWC") maximum achievable control technology ("MACT") standard at 40 CFR 63 Subpart EEE. The AIT discussion above also applies to the principal organic hazardous constituent ("POHC") analysis required at proposed §98.124(f)(4). The identified POHC may or may not have considered FGHGs with unknown AITs. However, as HWC regulated units must demonstrate 99.99% control efficiency every five years per 40 CFR 63.1207 (for RCRA incinerators). EPA should allow reporters to use existing comprehensive performance test ("CPT") results showing POHC DRE compliance in lieu of the POHC requirements. EPA should clarify that §98.124(f)(4) only concerns FGHGs with known AITs that comprise more than 0.01% of a combined stream controlled by a HWC MACT compliant combustion unit.

Response: A response regarding the use of surrogate compounds in destruction device performance testing has been provided in section II.E.3 of the preamble to this rule (see section II.E, Fluorinated Gas Production (Subpart L)). In the final rule, §98.124(g)(3) [formerly §98.124(f)(4) in the re-proposed rule] has been modified to allow facilities to apply the destruction efficiency determined for specific compounds in conjunction with the Hazardous Waste Combustion MACT in 40 CFR 63 subpart EEE, as long as specific criteria for compound selection in §98.124(g) are met. The selection of a surrogate(s) used in 40 CFR 63 subpart EEE testing must meet the criteria in §98.124(g)(1) for the most difficult to destroy compound in the vent to allow application of the DE from that program to the emission estimates for subpart L.

Commenter Name: John Dege
Commenter Affiliation: DuPont
Comment Number: EPA-HQ-OAR-2009-0927-0103,1
Comment Excerpt Number: 34

Comment: EPA should replace the proposed requirement to use the "most-difficult-to-destroy fluorinated GHG" during DRE testing with a requirement to use a fluorinated GHG (F-GHG) <u>representative</u> of the most difficult to destroy FGHG burned in the device. EPA: In the proposed 40 CFR 98.124(f)(1), EPA would require destruction efficiency testing "when destroying the most-difficult-to-destroy fluorinated GHG (or a surrogate that is still more difficult to destroy)" fed to the device. For devices destroying chlorofluorocarbons (CFCs), the Montreal Protocol and related Clean Air Act regulations restrict the availability of many CFCs in concentrated form to facilitate known FGHG injection for DRE testing. Moreover, EPA has adopted a thermal stability index developed by the University of Dayton Research Institute to rank organic chemicals (including FGHGs) into classes according to their difficulty to destroy (Appendix D of EPA's Guidance on Setting Permit Conditions and Reporting Trial Burn Results, January 1989, EPA/625-6-89/019). Comment: With this thermal stability index, EPA allows

DRE testing of an available Class 1 chemical to demonstrate DRE for all Class 1 (and lower-numbered classes of) chemicals. Similarly, successful DRE testing for a Class 2 chemical demonstrates DRE for all Class 2 (and lower-numbered classes of) chemicals. EPA has codified this approach in 40 CFR 1219(c)(3)(ii) requiring DRE testing with a compound "representative of the most difficult to destroy organic compounds." Therefore, EPA should replace the second sentence of the proposed 40 CFR 98.124(f)(1) with the following: "To determine the destruction efficiency, emission testing shall be conducted when operating at high loads reasonably expected to occur (i.e., representative of high total fluorinated GHG load that will be sent to the device) and when destroying a chemical representative of the most-difficult-to-destroy fluorinated GHG that is fed into the device from the processes subject to this subpart."

Response: A response has been provided in section II.E.3 of the preamble to this rule (see section II.E, Fluorinated Gas Production (Subpart L)).

Commenter Name: Jeff C. Muffat
Commenter Affiliation: 3M Center
Comment Number: EPA-HQ-OAR-2009-0927-0111.1
Comment Excerpt Number: 17

Comment: §98.124 (f) (3) Part 264, 266, and 270 principal organic hazardous constituent (POHC) testing, and (4) Hazardous Waste Combustor. In 3M's comments to the original proposed rule in correspondence dated June 9, 2009, 3M discussed the impact that these rules had on its Corporate Incinerator. The comment language from that document is provided below:

"3M has several facilities that produce materials that would be considered fluorinated- GHG materials under the rule definitions. One of these sites is also the home of a 3Mowned hazardous waste incinerator that is a stand-alone facility used to reduce the volume and toxicity of wastes that are generated in 3M manufacturing operations around the country. Currently under §98.126, reporting is required for materials that are shipped offsite for destruction. 3M is concerned that the rule could be read to require an annual DE test at this company-owned incinerator solely because wastes containing fluorinated-GHG, that are generated in some manufacturing operations at that same location, would be shipped to that incinerator instead of to an off-site incinerator for destruction. Such a DE test would not be required at third-party incinerators. It would be an unfair burden to require the 3M-owned incinerator to conduct these tests. Since all hazardous waste combustion facilities currently conduct rigorous trial burns, all incinerators should be exempt from the DE testing requirements, irrespective of whether the incinerator is collocated with a manufacturing operation or is off-site from such an operation.

As a general point, many solid wastes from fluorinated-GHG production processes are treated and completely destroyed in hazardous waste incinerators that are permitted and meet the requirements of 40 CFR Part 264. These facilities provide an extremely high degree of mitigation for fluorinated-GHG as they must conduct periodic trial burns under worst-case operating conditions, e.g. lowest operating temperature, which demonstrate greater than 99.99% destruction of Principal Organic Hazardous Constituents (POHC). POHC's have been identified as those organic compounds which are the most recalcitrant to thermal degradation. These tests are exhaustive studies that are intended to provide a clear demonstration of the facilities' capabilities and that are typically conducted at five year intervals.

In addition, waste incinerators are required under 40 CFR 264 and 40 CFR 63 MACT standards to utilize state-of-the-art emissions control practices and work practice standards to control emissions from waste management activities which will occur prior to incineration. EPA recognized the effectiveness of waste incinerators in the "Technical Support Document for Industrial Gas Supply: Production, Transformation, and Destruction of Fluorinated GHGS and N_20. Proposed Rule for Mandatory Reporting of Greenhouse Gases." (February 6, 2009).

3M believes that existing trial burn methodologies and other EPA requirements governing hazardous waste incinerators provide sufficient demonstration of the destruction of fluorinated GHGs. As such, 3M requests that any fluorinated GHGs that are managed are facilities subject to the provisions of 40 CFR Part 264 should be exempt from any reporting requirements. For the purposes of reporting, it should be assumed that these materials are totally destroyed."

3M's Corporate Incinerator functions as a stand alone facility. This is a typical rotary kiln incinerator with multiple waste feeds and having the capability of adding liquids, sludges, and solids that are transported to the facility in bulk tankers and various sized containers. There are no direct connections between this incinerator and any vents or pipelines that originate in the fluorinated-GHG production areas at the site. Wastes from the fluorinated-GHG facility which meet the definition of a fluorinated-GHG would be placed in containers, most commonly 55-gallon drums and 5-gallon pails, and transported in van trailers to the incinerator where they would be stored prior to disposal. In the reproposed Subpart L, EPA referenced the performance tests conducted by hazardous waste incinerators in §98.124(f)(3) Part 264, 266, and 270 principal organic hazardous constituent (POHC) testing and §98.124(f)(4) Hazard Waste Combustor testing. 3M has a number of concerns with the requirements in this section. We would reiterate our original comments that these requirements unfairly target facilities that happen to be collocated with fluorinated-GHG production facilities. These requirements would not apply to third party and/or commercial incinerators and they would not apply to corporate owned incinerators that are not located on the same site. This facility may also be unique from other onsite incinerators in this source category in that the incineration process has no direct connection to the manufacturing processes and the quantity of wastes that are generated from the affected processes at the site constitute a small amount of the waste that is incinerated at the facility.

An alternative method that EPA could use to address this concern would be to modify the language contained in §98.124(f)(1) through (4) so that it reflects the current practice and interpretation of the performance tests that are conducted at the facilities subject to the provisions of paragraphs (3) and (4). This includes the frequency of this testing and the manner in which the principal organic hazardous constituent (POHC) should be used to demonstrate compliance with the 99.99% percent destruction. Paragraph (2) of that section requires testing within the last five years prior to the effective date of this rule. Subpart EEE (par. 4) provides for having to demonstrate compliance with the DRE standard only once provided the source is not modified after the DRE test in a manner that could affect the ability of the source to achieve the DRE standard. Currently RCRA rules (par. (3)) require testing at least once every 10 years as part of the RCRA permit renewal. The DRE test is a complex and costly endeavor which requires significant planning and coordination. We recommend that this section be revised to indicate that testing must be completed at a frequency which is consistent with the applicable federal or state standards.

Additional clarification is also required in this section to insure that any Class 1 POHC's is an adequate surrogate for the "….most-difficult-to-destroy fluorinated-GHG fed into the device..."In the rule preamble, EPA indicates that surrogates can be used for the DRE demonstration. While the "surrogate" reference is contained in paragraph (f)(1) of this section, a similar reference is also required in paragraph (3) and (4) of that section. More importantly, EPA should clarify that Class 1 POHC's are acceptable surrogates. Methodologies for selecting and approving POHC's for DRE testing have been in place for some time (9). The selection of chemicals for trial burns is based on a number of factors including the incinerability ranking or presence and amount in waste feeds. The POHC thermal stability rankings are contained in the referenced document and are based predominantly on experimental studies conducted at the University of Dayton, studies reported in the open literature, and theoretical considerations, These chemicals have been grouped into seven classes based on thermal stability and as a practical manner, demonstration of a 99.99% DRE for a POHC in a class of higher thermal stabilities is adequate to allow incineration of chemicals contained both in that class in all lower classes. DRE demonstration for Class 1 chemicals adequately addresses all chemicals on this list. 3M's Corporate Incinerator conducted its trial burn using several POHCs. These included naphthalene (Thermal Stability Index: 5 (Class 1)) and the facility demonstration of DRE of greater than 99.99987. Testing on POHC's with lower stability indices had greater DREs.

3M believes that this information provides sufficient demonstration that all fluorinated-GHGs that are being incinerated at the facility are adequately destroyed and insignificant with respect to total inventory emissions. Proper clarification on the meaning of surrogate will insure that these performance tests are consistent with accepted practices in the industry. We are providing two references where the incineration of SF6 was evaluated in hazardous waste combustion processes. SF6 as an thermal stability index that is roughly equivalent to naphthalene and there is information in the literature which demonstrates a high degree of destruction in these RCRA-permitted units. (10,11)

Response: A response regarding the use of surrogate compounds in destruction device performance testing has been provided in section II.E.3 of the preamble to this rule (see section II.E, Fluorinated Gas Production (Subpart L).

The requirement to monitor and report fluorinated GHG emissions from incinerators that are co-located with fluorinated gas production processes is consistent with the Mandatory GHG Reporting Rule's general requirement to monitor and report emissions from all of the source categories at facilities whose emissions exceed the 25,000 mtCO_2e threshold. Please see the October 30, 2009 final rule (e.g., the response to comments regarding de minimis reporting) for more discussion of this policy.

We did not propose to require monitoring and reporting of fluorinated GHG emissions from incinerators and other destruction devices that are not co-located with fluorinated gas production processes. This was because total emissions of fluorinated GHGs from such facilities appeared likely, in general, to be small. However, we could consider requiring from such incinerators if subsequent research or data indicated that these conclusions were not correct.

Commenter Name: John Dege
Commenter Affiliation: DuPont
Comment Number: EPA-HQ-OAR-2009-0927-0103.1
Comment Excerpt Number: 32

Comment: Trace components need to be exempted from the Destruction Requirements. EPA: Section 98.124(f)(1) states " You must sample the inlet and outlet of the destruction device for a minimum of three runs of 1 hour each to determine the destruction efficiency" Comment: Achieving the prescribed DRE for small trace components may not be feasible. We suggest wording such as "Estimate annually the total mass of each fluorinated GHG emitted from destruction of fluorinated GHGs …Trace FGHGs in the destruction device influent are exempt from this section." A section 98.122 exemption for trace components would streamline and clarify application of an exemption, and would be preferred.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0085.1, excerpt 35.

Section 5.6.2 - Detection Limit Issues

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 20

Comment: EPA should also address a potential DRE testing condition that arises from time to time where a DRE calculation is impossible. In many situations, a control device operates so effectively that, during testing, the outlet concentration is below the method detection limit available from the test method. In these situations, as the control device outlet concentration is reported as less than the quantitation limit, an actual DRE calculation is not possible. EPA should note in regulatory language that outlet concentrations below an appropriate concentration threshold meet DRE requirements. In HON, EPA set this default concentration minimum by rule at 20 parts per million by volume ("ppmv"). EPA should provide reporters the option of reporting a minimum control device outlet concentration in lieu of a DRE value.

Response: Several commenters suggested that EPA develop an approach for determining the destruction efficiency when the outlet concentration of the destruction device is below the method detection limit. We have revised §98.124(g) in the final rule to allow use of a concentration that is one-half of the method detection limit in estimating the destruction efficiency. While using an outlet minimum concentration, for example the 20 ppmv mentioned by the commenter, is commonly used as a compliance option for regulations, in this situation what is needed is a reasonable, documented destruction efficiency, not necessarily a demonstration that the destruction device meets a particular limit.

Section 5.6.3 - Hazardous Waste Combustors

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 53

Comment: EPA should also clarify that HWC MACT units undergoing an automatic waste feed cutoff ("AWFCO") need not report under this provision, as AWFCOs are designed to prevent emissions from occurring from a hazardous waste combustor that is not operating properly. Facilities may not route FGHGs, or any other materials, to RCRA combusters until the cause of an AWFCO has been repaired. Because reporters must tract AWFCO activity for other EPA Clean Air Act obligations, EPA can review AWFCO activity to verify the lack of FGHG emissions during combustor shutdown events.

Response: EPA would like to note that emissions of all fluorinated GHG emissions from fluorinated gas production and transformation processes covered in the source category must be reported. As the comment states, during AWFCO periods, no materials may be routed or vented to the hazardous waste combustor. If these are bypass events or periods when uncontrolled fluorinated GHG emissions are vented to the atmosphere, then certainly the facility must account for these emissions, probably as malfunction emissions under §98.124(i). Industry has noted that some processes include holding tanks or operating modes that allow continued operation during destruction device downtime or malfunctions, either until the combustor can be brought back online or until shutdown of the process can be completed. In this situation, emissions are not vented to the atmosphere. Industry has noted that for some processes and fluorinated GHGs, there are never any bypass events because the facility is not authorized for such an event. Industry has noted that fluorinated GHG emissions from a process would be routed away from the hazardous waste combustor to another destruction device, for example a thermal oxidizer. In this situation, the facility could potentially estimate emissions based on the demonstrated DE for the other control device, or if no demonstrated DE is available, then assume the emissions are uncontrolled. Another alternative for the facility may be to define an operating scenario for periods when fluorinated GHG emissions are vented to the hazardous waste combustor, and define another operating scenario for periods when venting to another control device, if this is a regular event.

Commenter Name: John Dege
Commenter Affiliation: DuPont
Comment Number: EPA-HQ-OAR-2009-0927-0103,1
Comment Excerpt Number: 33

Comment: Consistent with MACT standards for hazardous waste combustors, EPA should allow one-time DRE demonstration for F-GHG for destruction devices with a flame in place of the proposed requirement for such testing every five years. EPA: In the proposed 40 CFR 98.124(f) and at 75 FR 18680, "EPA is proposing to require fluorinated gas producers that destroy fluorinated GHGs to conduct an emissions test every five years to determine the destruction efficiency (DE) of the destruction device." Comment: Based on extensive review of DRE (destruction and removal efficiency) performance at controlled flame hazardous waste combustion devices, EPA concluded that repeat DRE testing was not necessary for devices that do not feed waste in a location other than the flame zone as codified at 40 CFR 1207(c)(2)(iv) and 40 CFR 1206(b)(7)(ii). The appropriate exception from one-time DRE testing would the sort of process change described at existing proposed text for 40 CFR 98.124(f)(5). Therefore, 40 CFR 98.124(f) should be revised in the final rule to not require DRE testing more than once (except as noted at 40 CFR 98.124(f)(5)) and to delete the phrase "within the last 5 years prior to the effective date of this rule" from the final 40 CFR 98.124(f)(2).

Response: It is our understanding that 40 CFR 63 subpart EEE requirements include a one-time confirmatory performance test for dioxin/furan compounds for certain boiler types and fuel types, and include a comprehensive performance test every 5 years for other pollutants that may include metals (mercury, cadmium, lead, arsenic, beryllium, chromium), CO, HC, HCl, total chlorine, and PM. For those sources that feed hazardous waste to the normal flame zone, an initial comprehensive performance test to demonstrate the DRE would be conducted, and subsequent comprehensive performance testing would not require demonstration with the DRE standard if there were no changes to the source that would affect the ability to achieve the DRE standard. (For cement kilns that feed hazardous waste to the normal flame zone, facilities must conduct the DRE testing for three consecutive comprehensive performance tests.)

The DRE testing conducted under a part 63 subpart EEE comprehensive performance test may be used for subpart L purposes if the HWC testing meets the requirements for §98.124(g)(1)(i) through (iv). If hazardous waste is fed to the normal flame zone and DRE testing is not conducted every 5 years, facilities may use the destruction efficiency from the latest comprehensive performance test under part 63 subpart EEE as long as there have been no changes to the design, operation, or maintenance of the destruction device since the last destruction efficiency test that could affect the destruction efficiency.

Section 5.6.4 - Process Scrubbers Considered Destruction Devices

Commenter Name: Jeff C. Muffat
Commenter Affiliation: 3M Center
Comment Number: EPA-HQ-OAR-2009-0927-0111.1
Comment Excerpt Number: 17

Comment: 3M recommends that water scrubbers be specifically excluded from the destruction device definition and that all emission assessments for such devices be made at the outlet of the unit. Water scrubbers are used in many of these manufacturing areas either as a primary or back-up air pollution control device. The scrubbers are designed to remove hydrofluoric acid and acid halides (primarily carbonyl fluoride) that could be present in some of the process emissions. Carbonyl fluoride is very hygroscopic and reacts quickly in the presence of water to form HF and carbon dioxide. This has been confirmed by various tests that have been conducted to document scrubber performance. These hydrolysable compounds are included in the 40CFR60.191 definition of Total Fluoride and can be measured using EPA Method 13A and 13B. Emissions of these compounds are limited under the PSD/NSR three (3) ton/yr significance threshold.

3M believes that carbonyl fluoride would be considered a fluorinated-GHG since it contains carbon fluorine bonds and its vapor pressure exceeds 4000 mm Hg at 25°C. The smaller amounts of other acid halides that would be present will also have vapor pressures which exceed 1 mm Hg. In addition we also concerned that these scrubbers would be considered destruction devices as defined in §98.6: "Destruction means, with respect to fluorinated GHGs, the expiration of a fluorinated GHG to the destruction device actually achieved." 3M has conducted performance tests for many of these scrubbers and due to the reactivity of these compounds they are commonly reduced to less than their method detection limits.

The same mechanism that results in their effective removal in process scrubbers will also limit the atmospheric lifetime of these chemicals. Aqueous phase mitigation will result in rapid attenuation in the environment with very low lifetimes, e.g. 5-10 days being reported by a number of investigators (5-8).

Response: The final rule does not require destruction efficiency testing for wet scrubbers that are primarily in place for acid gas removal, either HF or HCl, as long as no appreciable reduction of fluorinated GHG occurs. Certainly, any water scrubber that is in series with a thermal destruction device and is in place primarily for acid gas control would not be required to determine the destruction efficiency, and water scrubbers that are in place as the primary or backup control device for acid gas removal would not be required to determine destruction efficiency either.

While this commenter notes that water scrubbers should not be included as destruction devices, another commenter notes that they do use water scrubbers specifically to control fluorinated GHG, although they do not specify the compound controlled (see the response to EPA-HQ-OAR-2009-0927-0103.1, excerpt 35. To estimate emissions from a process where fluorinated GHG emissions are controlled by a water scrubber, a facility has three options under subpart L: (1) calculate or measure emissions before the water scrubber and do not apply any destruction efficiency to the emissions, (2) perform emission testing after the water scrubber under §98.124(c) to develop a process-vent-specific emission factor that reflects the impact of the scrubber on the emissions, or (3) conduct destruction device performance testing under §98.124(g) to establish and apply a destruction efficiency for the scrubber. We believe that these options provide ample flexibility to facilities in the manner in which they may account for any impact of water scrubbers on their fluorinated GHG emissions.

Commenter Name: Jeff C. Muffat
Commenter Affiliation: 3M Center
Comment Number: EPA-HQ-OAR-2009-0927-0111.1
Comment Excerpt Number: 5

Comment: 7. We are requesting additional language to exempt certain destruction devices from additional testing requirements under this rule.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0111.1, excerpt 17.

Section 5.6.5 – PIC Testing

Commenter Name: John Dege
Commenter Affiliation: DuPont
Comment Number: EPA-HQ-OAR-2009-0927-0103.1
Comment Excerpt Number: 35

Comment: To the extent that EPA decides to require reporting of by-product FGHGs from the destruction of CFCs or HCFCs, EPA should allow facilities to use reaction modeling, literature values, pilot-scale data, and/or lab-scale test data in lieu of full-scale testing as the basis for such reporting. EPA: At 75 FR 18680, EPA requests comment on whether the Agency should "require reporting of by-product fluorinated GHG emissions from destruction of CFCs and HCFCs." Comment: A number of experimental and theoretical studies have been conducted to investigate products of incomplete combustion (PICs) from the incineration of CFCs. For example, abstracts for a number of publications by EPA's Office of Research and Development (ORD) describing their investigations of PIC formation from CFC destruction are presented at http://www.epa.gov/appcdwww/aptb/abstracts/cfc.htm. During development of basic data for projects to install CFC and/or HCFC flame-based thermal converters, pilot-scale testing may have been conducted including determination of PICs. Furthermore, Wing Tsang and his colleagues at the National Institute of Standards and Technology (NIST) have developed a comprehensive chemical kinetic mechanism and parameter database for C1 and C2 fluorinated hydrocarbon destruction in a flame environment that can be used to predict PICs and PIC concentrations; see Progress in Energy and Combustion Science, Vol. 21, pp. 453-529, 1996 and Combustion Science and Technology, Vol. 139, pp. 385-402, 1998 for a description of the mechanism, database, and related reaction modeling. EPA should allow facilities to use reaction modeling or existing test data in place of full-scale testing if the Agency decides to require reporting of by-product F-GHGs from CFC or HCFC destruction. One of our plants performs FGHG destruction of organic acid fluorides via use of a water scrubber. Experience has been there is no newly created F-GHGs discharged from this control device.

Response: We are not requiring testing of PIC formation from destruction of fluorinated gases in the final rule. We have, however, added a reporting requirement in 98.126(j) asking that facilities report any previous testing or analysis they have conducted to determine the extent of

PIC formation. This would be a one-time report. Please see the preamble of the final rule for more discussion of this issue.

Section 6 - Procedures for Estimating Missing Data

No comments are associated with this issue.

Section 7 Data Reporting Requirements

Section 7.1 Confidentiality Concerns

Commenter Name: Brian R. Keck
Commenter Affiliation: Air Products and Chemicals, Inc.
Document Control Number: EPA-HQ-OAR-2009-0927-0106.1
Comment Excerpt Number: 16

Comment: In [section] B, Fluorinated Gas Production, Section 7 [of the preamble], EPA notes that facilities using the mass-balance approach would report the masses of the reactants, products, by-products, and wastes, and, if applicable, the quantities of any products in the by-products and/or wastes. The chemical identities of reactants, products, and by-products also have to be reported, along with the chemical equations used to estimate emissions. Air Products advises that this information on yields, by-products and chemical equations is extremely sensitive, confidential business information (CBI) that is paramount to market competitiveness. Air Products strongly recommends that this data be maintained only at the respective industrial facility and only be provided for visual evaluation and validation during on-site inspection. This is currently done with EPA's Toxics Release Inventory.

Response: Because the mass balance approach has been revised to allow its use for transformation processes, the reporting requirements have changed somewhat since re-proposal; however, similar types of information must be monitored, recorded, and reported for the promulgated rule. See the preamble of the final rule and section 4.2 of this RTC document for discussion regarding changes to the mass balance approach. Those facilities that use the mass balance approach to estimate emissions are required to submit data that includes the chemical equation that represents the production process and the chemical identities and the total mass of the reactants, by-products, products, and streams that are destroyed and removed from the production process (by process). This information is necessary to verify the fluorinated GHG emissions. Facilities that use the site-specific process-vent-specific emission factor approach or the site-specific process-vent-specific emission calculation factor to estimate emissions must submit data on the mass of total product or other process activity data on which the emissions factor and the emissions rate are based.

EPA is requiring reporting, rather than simply retention, of this data in order to permit EPA to conduct an annual verification of the emissions quantities reported by each facility. Due to EPA resource constraints, it is unlikely that EPA would be able to make site visits annually to verify reports based on facility records. Without reporting of verification data, therefore, the frequency of verification would be lower, while the costs of such verification would be much higher. Nonetheless, EPA is aware of the commenters' concerns and may consider moving certain requirements from the reporting section to the recordkeeping section of the rule following further analysis.

A brief discussion of EPA's recent proposed Confidentiality Determination is provided in section II.B of the preamble to this rule (see section II.B, Overview of Confidentiality Determination for Data Elements in the Mandatory GHG Reporting Rule). EPA published a proposed confidentiality determination on July 7, 2010 (75 FR 39094) which addressed this issue the CBI status of certain data elements. In that action, EPA proposed which specific data elements would be treated as CBI and which data elements must be available to the public under section 114 of the CAA. EPA has received comments on the proposal and is in the process of considering these comments. A final determination will be issued before any data is released, and the final determination will include all of the data elements under these subparts. In addition to proposing the confidentiality determinations, EPA is designing the data reporting system to handle confidential business information that is submitted under the Mandatory GHG Reporting Program.

More discussion of the treatment of Confidential Business Information under subpart A, General Provisions, of part 98 and discussion of the verification process appears in section II of the preamble for the Mandatory Reporting of Greenhouse Gases; Final Rule (74 FR 56260) and the related general provision Comment and Response Documents found in EPA-HQ-OAR-2008-0508.

For a discussion of the relationship between the reporting required under the Mandatory GHG Reporting Rule and the reporting required by the Toxics Release Inventory, please see the response to comment EPA-HQ-OAR-2008-0508-0604.1, excerpt 5 in Volume 13 of the Response to Comments Documents prepared for the final Mandatory GHG Reporting Rule published on October 30, 2009. For additional discussion of the data reporting requirements, please see the response to EPA-HQ-OAR-2008-0508-0509.1, excerpt 1 in Volume 3 of the Response to Comments Documents for the final Mandatory GHG Reporting Rule. For responses to general comments on verification, please see the comment response document volume on Approach to Verification and Missing Data.

Commenter Name: Joel R. Hall
Commenter Affiliation: Mexichem Fluor Inc.
Document Control Number: EPA-HQ-OAR-2009-0927-0104
Comment Excerpt Number: 9

Comment: Mexichem considers some of the data that must be submitted to be confidential business information that is beyond the scope of the proposed rule and requests that it be designated as a record that must be maintained in the final rule. Data considered by Mexichem to be confidential business information and beyond the scope of the rule are: the chemical identities of the contents of the streams analyzed under the initial scoping test, the location and function of the streams that were analyzed under the initial scoping test. Mexichem understands that this data needs to be maintained, but questions the need to submit it to the agency. Mexichem requests that this data be deleted from §98.126 and added to records that must be kept under §98.127.

Response: In addition to estimates of their fluorinated GHG emissions and the supporting data that are used to develop emissions estimates, facilities are required to submit the identity of fluorinated GHG compounds identified during the initial scoping test to confirm which compounds are generated in the production process and potentially emitted. These data help to identify fluorinated GHGs that are present and that should be accounted for in the emissions estimates. While industry has indicated that facilities identify the compounds generated by the production process earlier during laboratory, bench-scale, and pilot-scale development phases, there have been instances where facilities have identified additional compounds when they have conducted a species analysis on full-scale processes. (In some cases, these additional compounds may also have been present in the laboratory, bench-scale, or pilot-scale phases, but they were first identified in the full-scale production process because more sensitive tests were applied to the full-scale process.)

EPA is requiring reporting, rather than simply retention, of these data from the initial scoping test to verify that all potentially emitted fluorinated GHG are appropriately accounted for in the reported fluorinated GHG emissions estimates. Please see the response to comment number EPA-HQ-OAR-2009-0927-0106.1, excerpt 16 for more discussion of the decision to require reporting rather than recordkeeping for various data elements.

Commenter Name: Lorraine Krupa Gershman
Commenter Affiliation: American Chemistry Council
Document Control Number: EPA-HQ-OAR-2009-0927-0092.1
Comment Excerpt Number: 2

Comment: Furthermore, we continue to be very concerned about the required submission of confidential business information (CBI). The public release of some of the information that is required to be reported under this subpart jeopardizes our members' international competitiveness, in that it details how ACC member companies manufacture fluorinated GHGs. We urge EPA to release its proposal on handling CBI under the MRR as soon as possible so that ACC member companies may evaluate and gauge the protectiveness of EPA's proposed handling procedures before the sensitive information is submitted to the Agency.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0106.1, excerpt 16.

Commenter Name: Brian R. Keck
Commenter Affiliation: Air Products and Chemicals, Inc.
Document Control Number: EPA-HQ-OAR-2009-0927-0106.1
Comment Excerpt Number: 2

Comment: However, furthermore, we continue to be very concerned about the required submission of confidential business information (CBI). The public release of information that is required to be reported under this Subpart, as well as other Subparts of the GHG MRR, jeopardizes our international competitiveness, in that it details how we manufacture fluorinated GHGs. We urge EPA to release its proposal on handling CBI under the MRR as soon as possible.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0106.1, excerpt 16.

Commenter Name: Dave Stirpe
Commenter Affiliation: Alliance for Responsible Atmospheric Policy
Document Control Number: EPA-HQ-OAR-2009-0927-0117.1
Comment Excerpt Number: 14

Comment: The Confidential Business Information (CBI) protection in the proposed Rule is not broad enough to ensure adequate protection. The data related to manufacturing processes that is demanded for facilities does not appear to be protected in the same manner as other data. It appears that EPA is overreaching to require that so much information be made available to the public. It would be preferable for EPA to keep corporate data confidential and to release aggregate industry or product category data. The current demands for detailed, equipment-based information would open companies to complete disclosure of chemical and technical processes. Such revelation that would create significant CBI exposure to reporting companies is not acceptable and would encourage relocation of new confidential technology facilities outside the US. EPA should not require reports from internal facility process flows that do not emit.

Response: Please see the responses to comment number EPA-HQ-OAR-2009-0927-0106.1, excerpt 16 and comment number EPA-HQ-OAR-2009-0927-0104, excerpt 9. Even if internal facility process flows do not emit, they may be critical to understanding and verifying emission estimates submitted by facilities. For example, the mass-balance calculation relies on measurement of flows that are not emitted (e.g., the quantities of reactants, products, and by-products destroyed).

Commenter: Brian R. Keck
Commenter Affiliation: Air Products and Chemicals, Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0106.1
Comment Excerpt Number: 3

Comment: Eliminate the reporting requirements for process and business information, which by its very nature represents confidential business information. Where such information is relied upon to develop the annual emissions inventory, it can be made available for review upon request without compromising the confidential nature.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0106.1, excerpt 16.

Commenter Name: Brian R. Keck
Commenter Affiliation: Air Products and Chemicals, Inc.
Document Control Number: EPA-HQ-OAR-2009-0927-0106.1
Comment Excerpt Number: 17

Comment: In Section B.ii.2 of the Technical Support Document (TSD), EPA provides the Mass Balance approach equations. Equations L-7, L-10, L-11 and L-12 address yield loss and other production process parameters and data that are considered very proprietary by the manufacturer. Air Products advises that this information on yields, by-products and chemical equations is extremely sensitive, confidential business information (CBI) that is paramount to market competitiveness. Air Products strongly recommends that this data be maintained only at the respective industrial facility and only be provided for visual evaluation and validation during on-site inspection. This is currently done with EPA's Toxics Release Inventory.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0106.1, excerpt 16.

Commenter Name: Brian R. Keck
Commenter Affiliation: Air Products and Chemicals, Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0106.1
Comment Excerpt Number: 26

Comment: Equations L-7, L-10, L-11 and L-12 address yield loss and other production process parameters and data that are considered very proprietary by the manufacturer. Air Products advises that this information on yields, by-products and chemical equations is extremely sensitive, confidential business information (CBI) that is paramount to market competitiveness. Air Products strongly recommends that this data be maintained only at the respective industrial facility and only be provided for visual evaluation and validation during on-site inspection.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0106.1, excerpt 16.

Commenter Name: Brian R. Keck
Commenter Affiliation: Air Products and Chemicals, Inc.
Document Control Number: EPA-HQ-OAR-2009-0927-0106.1
Comment Excerpt Number: 7

Comment: §98.126(b)(1) and (2). Data reporting requirements for the mass balance approach require reporting of the data used to calculate absolute and relative uncertainties, as well as the balanced chemical equation that describes the reaction used to manufacture the fluorinated GHG product. Specifically, the stoichiometric coefficients used in Equation L-7 of subpart L must be reported. Air Products advises that this information on yields, by-products and chemical equations is extremely sensitive, confidential business information (CBI) that is paramount to market competitiveness. Air Products strongly recommends that this data be maintained only at the respective industrial facility and only be provided for visual evaluation and validation during on-site inspection. This is currently done with EPA's Toxics Release Inventory.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0106.1, excerpt 16.

Commenter Name: John Dege
Commenter Affiliation: DuPont
Document Control Number: EPA-HQ-OAR-2009-0927-0103.1
Comment Excerpt Number: 38

Comment: Section 98.126 requires reporting of confidential business information. EPA: Confidential business information is required to be reported annually per §98.126(a), (b), and (c) which includes: chemical content, location and function of process streams, total mass produced of FGHG products, total mass and chemical formula of each reactant, total mass of reactants and products permanently removed from the process, the mass and chemical formula of each by-product generated. Comment: We recommend, like EPA's Toxic Release Reporting Requirements, that only emissions are reported to EPA, confidential business information used to determine the emissions should be kept on-site, and available for agency review. This can affect our international and domestic competitiveness—EPA needs to rethink their current procedures and requirements.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0106.1, excerpt 16.

Commenter Name: Lorraine Krupa Gershman
Commenter Affiliation: American Chemistry Council
Document Control Number: EPA-HQ-OAR-2009-0927-0092.1
Comment Excerpt Number: 32

Comment: As we noted in our June 2009 comments, we are concerned about the types of data that are required to be reported under this rule. Much of the required data in this subpart are considered confidential business information, and the release of such data to the public could jeopardize the international competitiveness of ACC member companies. We suggest that only emissions should be reported to EPA, and CBI used to calculate the emissions should be kept on-site available for EPA review. This is the practice used for CBI data in EPA's Toxics Release Inventory and we urge EPA to adopt that practice here.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0106.1, excerpt 16.

Commenter Name: Dave Stripe
Commenter Affiliation: Alliance for Responsible Atmospheric Policy
Document Control Number: EPA-HQ-OAR-2009-0927-0067
Comment Excerpt Number: 3

Comment: As much of the required reporting information is confidential business information, the Alliance supports EPA developing appropriate confidential business information protections in the pending part 98 reporting tool.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0106.1, excerpt 16.

Section 7.2 Other comments

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Document Control Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 37

Comment: EPA should clarify §98.126(f)(6) to denote that source tests must be submitted within reasonable time of conducting a test. Triggering a test report date on a process change is inappropriate. EPA did not provide a clear due date structure for testing conducted for reasons other than process changes.

Response: In the final rule, EPA has clarified the required timing and frequency of destruction device performance testing and of reporting of this testing. Specifically, facilities that destroy fluorinated GHGs and that wish to reflect this destruction in their emission estimates must perform destruction efficiency performance testing by February 29, 2012. Facilities must repeat the testing every 10 years thereafter, unless they make a change to the device that would be expected to affect the device's destruction efficiency. In this case, the facility must re-test the device before the February 28 of the year that immediately follows the change. Facilities must also submit a report by March 31, 2012 (or by March 31 of the year immediately following the year in which they begin destroying fluorinated GHGs) that includes the (1) destruction efficiency of each destruction device for each fluorinated GHG whose destruction the facility reflects in its emission estimates, (2) the chemical identity of the fluorinated GHGs used in the performance test, including surrogates, and information on why the surrogate is sufficient to demonstrate the destruction efficiency for each fluorinated GHG, (3) the date of the most recent destruction device test, and (4) the names of all applicable Federal or State regulations that may apply to the destruction process. This report is one-time unless the facility makes a change to the device that would be expected to affect its destruction efficiency, in which case the facility must submit a revised report by March 31 of the year immediately after it makes a change to the device. EPA believes that these dates allow facilities a reasonable amount of time to perform the test and to report the change, while ensuring that the emissions reported for the year during which the change is made reflect the change.

Note that EPA has not included requirements to submit actual emissions test reports to the Agency under this subpart. However, EPA is requiring that facilities retain records of emissions performance testing reports (including revised reports) for each destruction device. The emissions performance testing report must contain all information and data used to derive the destruction efficiency for each fluorinated GHG whose destruction the facility reflects in §98.123, as well as the key process and device conditions during the test.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Document Control Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 38

Comment: Further, EPA should defer to other Clean Air Act authority if the other authority has different test report deadlines. For example, a HWC MACT unit using a CPT process to evaluate FGHG emissions must time its testing schedule to conform with 40 CFR 63 Subpart EEE. EPA should clarify that any Clean Air Act authority containing a deadline longer than 60 days overrides the 60 day due date when Part 98 testing is combined with other EPA required testing. EPA should further require reporters to explain this situation in any test report where conflicting test report deadlines may occur.

Response: EPA has revised the destruction efficiency testing frequency to once every 10 years, instead of once every five years as proposed. Facilities may use previous destruction device testing (including testing carried out under certain other Clean Air Act regulations) that meets the requirements in §98.124(g). Because many other rules require testing on a 5-year frequency, , a facility that conducts testing at 5-year intervals should also be able to demonstrate compliance with the 10-year frequency in subpart L. (Under 40 CFR 63, subpart EEE for Hazardous Waste Combustors, certain hazardous waste combustors that feed waste to the flame zone are required to conduct a DRE test once; for those combustors, the most recent DRE testing may be used to satisfy subpart L if no design, operation, or maintenance changes or modifications have been made since that test that would affect the destruction efficiency.) However, if a facility destroys PFCs or SF_6 and wishes to reflect this destruction in its emission calculations, and if it has not previously tested the destruction device with these compounds, then the facility will need to perform this testing before reflecting destruction of PFCs or SF_6 in its calculations. As discussed in the preamble of the final rule, PFCs and SF_6 compounds are substantially more thermally stable than most class 1 POHCs, and therefore the destruction efficiencies determined for these class 1 POHCs will not be applicable to PFCs or SF_6. Also, if a facility makes a change to the device that would be expected to affect the device’s destruction efficiency, the facility must submit a revised report by March 31 of the year immediately following the change.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Document Control Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 4

Comment: EPA requires fluorochemical marketers to report basic mass balance information for fluorinated greenhouse gas (“FGHG”) production at §98.416(a)(8) and (a)(9) of Subpart OO. Upon final Subpart L promulgation, these Subpart OO provisions become redundant. Subpart L facilities will be reporting the same process throughput data per either proposed §98.126(b)(3) and (b)(5) or §98.126(c)(1). Reporting the same data in two reports, one with quality assured data (Subpart L) and one with estimated data not subject to quality assurance provisions (Subpart

OO) invites unnecessary comparisons between data sets of differing quality. Requiring production data to be reported in one place minimizes the confidential business information ("CBI") concerns discussed below. EPA should defer to the quality assured Subpart L provisions in a new §98.126(h) that notes that compliance with §98.126 throughput reporting requirements satisfies §98.416(a)(8) and (a)(9) reporting obligations. Were EPA to determine that all reporters required to document production throughput in Subpart OO will be required to comply with Subpart L, then EPA should delete and reserve §98.416(a)(8) and (a)(9).

Response: Although EPA did not open subpart OO to comment through this rulemaking, we note that the reporting requirements at §98.146(a)(8) and (9) (mass of reactants fed into the process and mass of reactants, byproducts, and other wastes permanently removed from the process) are not necessarily redundant with those in subpart L. While these data elements are required to be reported for the mass balance approach in subpart L, only one of them (reactants) *could* be reported under the emission factor or emission calculation factor approach, and only if it is used as the process activity data in the emissions calculation. While the commenter expresses concern that there are different quality assurance provisions between subpart L and subpart OO, nothing prevents facilities from reporting the more quality-assured quantity under both subparts; in fact, if facilities use the mass-balance approach under subpart L, they must report the same fluorinated GHG production for the process under subpart OO.

Commenter Name: Dave Stirpe
Commenter Affiliation: Alliance for Responsible Atmospheric Policy
Comment Number: EPA-HQ-OAR-2009-0927-0117.1
Comment Excerpt Number: 10

Comment: EPA Should Further Clarify The Interplay between Subpart L and Subpart OO. The Alliance appreciates EPA's efforts to integrate Subpart L and the 2009 Subpart OO to minimize reporting overlap. Subpart OO regulates fluorinated greenhouse gases in commerce, including sales, imports and exports, and destruction of fluorinated greenhouse gas products.

Both the proposed Subpart L and the final Subpart OO require fluorinated greenhouse gas production reporting. EPA should develop a method to consolidate production reporting between the two Subparts is. As much of the required production reporting information is business confidential, the Alliance supports EPA developing appropriate confidential business information protections in the pending Part 98 reporting tool.

Response: EPA recognizes the potential overlap between the reporting under subpart L and that under subpart OO. In general, subpart OO is focused on production, transformation, and destruction of fluorinated GHGs and subpart L is focused on emissions of fluorinated GHGs from production facilities. However, some data are required to be reported under both subparts. This data falls into two categories. First, in some cases, the primary data being reported under one subpart (e.g., fluorinated GHG production under subpart OO) is also required to be reported under the other to aid in data verification (e.g., production under subpart L, which may be used in the subpart L emissions calculations and would be expected to be correlated with emissions generally.) Second, some of the emissions reported under subpart L are of fluorinated GHGs whose production is also reported under subpart OO. This category includes emissions from venting or destruction of fluorinated GHGs that are returned to the facility from the field, and emissions from transformation of fluorinated GHGs that are produced at other facilities.

For the first type of overlapping data, EPA will consider whether and how the data reporting process could be streamlined.   For the second type of overlapping data, EPA is requiring separate reporting of emissions that were (or may have been) counted previously as additions to the fluorinated GHG supply. This is to ensure that they are not double-counted as both supply and emissions.

For more discussion of confidential business information determinations and treatment, please see the response to comment number EPA-HQ-OAR-2009-0927-0092.1, excerpt 2.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 3

Comment: Because Subparts L and OO require reporting of different aspects of the fluorochemicals industry, some provisions of these subparts address similar reporting requirements. For example, proposed §§98.122(c)(1), (c)(2), and (c)(3) of Subpart L require reporters to provide EPA the same data as §§98.416(a)(1), (a)(2), and (a)(3) of Subpart OO. Both sets of provisions require reporting of production, transformation, and destruction of FGHG products. Because Subpart OO is primarily concerned with FGHG entry into commerce, EPA should rely on Subpart OO throughput reporting instead of duplicating throughput reporting requirements in Subpart L. Proposed §98.122(c) is redundant with existing §98.416(a) for Subpart OO reporters also reporting under Subpart L. EPA should note in the main part of §98.122(c) that reporting throughput parameters under the existing Subpart OO provisions satisfies §98.122(c) requirements. EPA should harmonize these two subparts as much as possible instead of imposing double reporting on the regulated community.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0085.1, excerpt 4, and please see the response comment number EPA-HQ-OAR-2009-0927-0117.1, excerpt 10.

Commenter Name: Dave Stripe
Commenter Affiliation: Alliance for Responsible Atmospheric Policy
Comment Number: EPA-HQ-OAR-2009-0927-0067
Comment Excerpt Number: 2

Comment: The Alliance appreciates EPA's efforts to integrate Subpart L and last year's Subpart OO to minimize overlap. Both the proposed Subpart L and the final Subpart OO require fluorinated greenhouse gas reporting. EPA should develop a method to consolidate production reporting between the two subparts.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0085.1, excerpt 4, and please see the response comment number EPA-HQ-OAR-2009-0927-0117.1, excerpt 10.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Document Control Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 5

Comment: EPA should also harmonize proposed §98.124(g) and §98.416(a)(3) requirements to document the amount of FGHG entering the facility for destruction. EPA should clarify that the inbound FGHG reporting in Subpart OO meets the Subpart L reporting requirement.

As EPA considers finalizing reporting requirements for recovered refrigerants subject to disposal, the Agency should carefully consider if such regulation would discourage responsible refrigerant management practices. EPA should not proscribe reporting obligations that discourage end users or refrigerant servicing entities from proper recovery, reuse, or disposal of refrigerants.

Response: EPA has revised §98.124(h) in the final rule (formerly §98.124(g) at re-proposal) and made slight revisions to §98.414(h) to increase the consistency between these two provisions. (Paragraph 98.414(h) is the monitoring provision in subpart OO that corresponds to §98.124(h) in subpart L, and whose results are reported under §98.416(a)(3) in subpart OO.) One difference remains: where the fluorinated GHG is not the only material included in the mass fed into the destruction device (e.g., contained in returned cylinders), the concentration of the fluorinated GHGs in the mass fed into the destruction device must be measured under §98.124(h) while it need only be estimated under §98.414(h) .

EPA has concluded that such measurement is important for purposes of subpart L because fluorinated GHGs bound for disposal are generally being disposed of because they are no longer pure,[1] and the efficiency with which fluorinated GHGs are destroyed (DE) varies depending on the identity of the fluorinated GHGs. Thus, if a returned cylinder is believed to contain SF_6, but it actually contains SF_6 mixed with CF_4, which is more difficult to destroy, the extent and the nature of the emissions from the destruction will be not be calculated or reported correctly unless the contents of the cylinder are analyzed.

The commenter implies that a requirement to measure the concentrations of fluorinated GHGs in the mass fed into the destruction device could discourage proper recovery, reuse, or disposal of refrigerants, but the commenter does not provide any rationale to support this concern. EPA does not believe that the measurement requirement will discourage proper handling of refrigerants. First, fluorinated GHGs, including refrigerants, that are being destroyed are not

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[1] This may be because they have broken down under hot or energetic conditions (e.g., compressor burnouts for refrigerants or excessive arcing for SF_6) or because they have been accidentally mixed with other fluorinated GHGs (e.g., two different refrigerants).

being recycled. Thus requirements to analyze destroyed fluorinated GHGs cannot interfere with recycling. Second, facilities would be expected to analyze the contents of materials returned to their sites for recycling or destruction in the ordinary course of business. This is because such analysis is necessary to verify that the materials may be safely recycled or fed into destruction devices.

To minimize inconsistent monitoring and reporting between §98.414(h) and §98.124(h), facilities may report under §98.416(a)(3) the quantity fed into the destruction device that is monitored under §98.124(h).

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Document Control Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 40

Comment: As much of Subpart L forces technology, Arkema assumes that, over the next several years, the calculation procedures, testing methods, and monitoring capabilities available to reporters will improve. When reporters evaluate these improvements, a reporting entity may find opportunities to amend prior reports with improved actual FGHG emissions data. So far, EPA has not included any Part 98 update provisions in the several climate change reporting rulemaking packages that have been proposed. EPA should amend the Part 98 Subpart A general provisions to allow reporters to update actual FGHG emissions data, in a manner similar to how Toxic Release Inventory ("TRI") reporting entities may update actual TRI release reports for prior years. This update capability should extend for either three or five years after report submittal. EPA should encourage best available actual FGHG emissions data by providing a reasonable report update mechanism.

Response: The Mandatory GHG Reporting Rule already includes a mechanism at §98.3(h) to revise an annual report in the event that the facility or EPA discovers an error in the in the report. However, EPA is not finalizing a provision at this time to allow facilities to update their reports based on improved data or methods. While EPA agrees that it may be desirable to update emissions estimates for previous years based on improved data or methods, such updates must be undertaken carefully, ensuring that the improved methods or data are properly applied to past activities. Otherwise, inappropriate application of revised data or methods to past activities may misrepresent both the past emissions and the emissions trend over time. In the future, EPA plans to consider whether it is appropriate to include a provision for recalculating previous emissions based on improved data or methods under the Greenhouse Gas Reporting Program, and if so, how such a resubmission process should be implemented. If the Agency concludes that updates should be allowed, EPA will initiate a rulemaking to adopt update provisions in subpart A.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Document Control Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 50

Comment: Proposed §98.127(b)(9) requires reporters to document when FGHG process vent emissions are controlled. The proposal states that facilities are to keep records relating to the dates and times emissions from FGHG "campaign[s] or batch[es]." EPA should clarify if "campaign" is meant to include continuous process activities. Arkema views campaigns as short-term production activities not typically associated with long-term production from baseload continuous production units that do not change production characteristics over time.

Existing Title V obligations under 40 CFR 70 and permitting authority Title V regulations mandate that reporting facilities document when emissions are not properly routed to an emission control device. EPA should require reporters to document when FGHG emissions bypass expected emission controls.

Documentation of non-control fits existing Clean Air Act reporting obligations. This proposal requires reporters to maintain mirror image records, one set for when the system operates properly, one for when the system is in bypass. Such double recordkeeping invites inconsistency and inaccuracy.

Response: EPA has added an alternative to §98.127(b)(6) (formerly §98.127(b)(9) in reproposal) to allow facilities to record the dates and time periods when process vents bypass the destruction device. Adding the alternative allows facilities to choose whether they will record vented periods or bypass periods. EPA has removed the terms campaign and batch since these terms were confusing to commenters, and has instead simply referred to time periods during which the process was operating.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Document Control Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 51

Comment: In addition, many reporters operate units under air permits that allow for a limited amount of bypass time. Many reporters may elect to document this authority as an alternate operating scenario, instead of as a bypass under §98.127(b)(9). EPA should clarify that only those bypass events not managed under the alternate operating scenario authority elsewhere in Subpart L must be reported at §98.127(b)(9).

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0085.1, excerpt 50 and excerpt 52.

Commenter Name: Brian R. Keck
Commenter Affiliation: Air Products and Chemicals, Inc.
Document Control Number: EPA-HQ-OAR-2009-0927-0106.1
Comment Excerpt Number: 4

Comment: Reduce the reporting burden associated with supporting information. In an effort to create an assurance of accuracy, the agency has set reporting requirements for an exhausting level of information. Where such information is relied upon support emissions calculations, it can be made available upon request.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0106.1, excerpt 16.

Commenter Name: John Dege
Commenter Affiliation: DuPont
Document Control Number: EPA-HQ-OAR-2009-0927-0103.1
Comment Excerpt Number: 40

Comment: Section 98.126(a)(1) and (2) inappropriately requires annual reporting of the initial scoping study. EPA: Section 98.126 (a) states: "All facilities: In addition to the information required by §98.3(c), you shall report the following information: (1) The chemical identities of the contents of the stream(s) (including process, emissions, and destroyed streams) analyzed under the initial scoping measurement of fluorinated GHG at §98.124(a)…" Comment: §98.124(a) stipulates a one-time initial scoping study. Since the scoping study will contain business confidential information (CBI), and creates unnecessary administrative burden to submit annually, it is recommended to be kept on site for agency inspection and review, but not reported to the agency initially or annually.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0106.1, excerpt 16 and see the response to comment number EPA-HQ-OAR-2009-0927-0104, excerpt 9.

Commenter Name: Lorraine Krupa Gershman
Commenter Affiliation: American Chemistry Council
Document Control Number: EPA-HQ-OAR-2009-0927-0092.1
Comment Excerpt Number: 33

Comment: Section 98.126(a)(3) incorrectly requires annual emissions reporting for equipment leaks. Facilities that calculate fluorinated GHG emissions using the mass balance method are not required to monitor for equipment leaks, and therefore should not have to report them.

Response: EPA has clarified in the promulgated rule that only those facilities that are using the site-specific process-vent-specific emission factor or emission calculation factor are required to report the method used to estimate emissions from equipment leaks.

Commenter Name: John Dege
Commenter Affiliation: DuPont
Document Control Number: EPA-HQ-OAR-2009-0927-0103.1
Comment Excerpt Number: 39

Comment: Section 98.126(a)(3) incorrectly requires annual emissions reporting for equipment leaks. EPA: Section 98.126(a)(3) states: “The annual emissions of each fluorinated GHG by process, for equipment leaks, and for the facility as a whole.” Comment: Facilities that calculate FGHG emissions by the mass balance option are not required to monitor for equipment leaks, and therefore should not report them.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0092.1, excerpt 33.

Commenter Name: Lorraine Krupa Gershman
Commenter Affiliation: American Chemistry Council
Document Control Number: EPA-HQ-OAR-2009-0927-0092.1
Comment Excerpt Number: 34

Comment: Section 98.126(e) requires reporting of monitoring results for deviations from monitoring limits set during the emissions test. “Deviation” is a defined term for the Part 71 air permit program and means failure to meet an emission limitation/requirement (40 CFR 71.6(a)(3)(iii)). This is not the intent, nor should it be, for emission estimation required for this rule. We recommend the following wording for §98.126(e): (e) Reporting of destruction device monitoring data. A fluorinated GHG production facility that destroys fluorinated GHGs shall report excess emissions that result from malfunctions of the destruction device or associated equipment. Such excess emissions would occur if the destruction efficiency was reduced due to the malfunction.

Response: EPA agrees with the commenter and the term “deviation” has been removed from §98.126(e) in the promulgated rule. §98.126(e) has been updated to focus on reporting of the emissions that occur due to malfunctions of the destruction device. Use of the term “deviation” has also been removed from §98.124(i) (formerly §98.124(h) at re-proposal), and the requirements here focus on accounting for reduced destruction efficiency during any periods when operating outside of permitted or manufacturer specified operating conditions for the device.

Commenter Name: John Dege
Commenter Affiliation: DuPont
Document Control Number: EPA-HQ-OAR-2009-0927-0103.1
Comment Excerpt Number: 41

Comment: Alternate wording recommended for Section 98.126(e). EPA: §98.126(e) requires reporting of monitoring results for deviations from monitoring limits set during the emissions test. Comment: Deviation is a defined term for the Part 71 air permit program and means failure to meet an emission limitation/requirement per 40CFR 71.6(a)(3)(iii). This is not the intent, nor should it be, for emission estimation required for this rule. DuPont recommends the following wording; “(e) Reporting of destruction device monitoring data. A fluorinated GHG production facility that destroys fluorinated GHGs shall report excess emissions that result from malfunctions of the destruction device or associated equipment. Such excess emissions would occur if the destruction efficiency was reduced due to the malfunction."

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0092.1, excerpt 34.

Section 8 Records that Must be maintained

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Document Control Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 44

Comment: Proposed §98.127(b)(7) requires reporters to identify "whether the process was representative or whether it was another operating scenario." We believe that EPA is requesting reporters to document operating scenario changes over time and times where operations were not representative of the §98.124 basis. EPA should clarify this language, and include provisions documenting new operating scenarios and process changes that do not constitute new operating scenarios.

Response: The EPA agrees that the language in proposed §98.127(b)(7) could be more clear. As part of the effort to clarify and stream-line the use of the term operating scenario throughout the rule, this paragraph §98.127(b)(7) was deleted from the promulgated rule, as it was not necessary. See section 4.3 of this RTC document for discussion of changes to the rule related to the concept of an operating scenario.

Section 9 No Comments

Section 10 Other subpart 1 comments

Section 10.1 Definitions

Commenter Name: John Dege
Commenter Affiliation: DuPont
Document Control Number: EPA-HQ-OAR-2009-0927-0103.1
Comment Excerpt Number: 1

Comment: The FGHG definition vapor pressure threshold of 1mm Hg needs to be increased. EPA: Applicability for Subchapter L reporting is based on the definition of Fluorinated Greenhouse Gas (FGHG) in Subpart A: "Fluorinated Greenhouse Gas means …and any fluorocarbon except for controlled substances as defined at 40CFR part 82, subpart A and substances with vapor pressures of less than 1 mm hg absolute at 25 degrees C…." Comment: A vapor pressure of 1 mm Hg encompasses products that are considered non-volatile with small air emission potential. EPA developed the definitions of heavy liquid and light liquid to appropriately focus Hazardous Air Pollutant regulations on process streams with sufficient emission potential to justify the cost of routine measurement. 40 CFR 63 subpart H (40 CFR 63.161) defines light liquid with vapor pressure of the regulated constituents at greater than 0.3 kilopascals at 20°C (approximately 2.2 mm Hg). For example, one of our large sites that monitors over 10,000 components for a wide range of HAPs and VOCs has not found a leaking component in the last 2 years for a chemical with a vapor pressure less than 15 mm Hg. Application of the light liquid vapor pressure threshold to the FGHG definition would more appropriately exclude heavy fluorochemical, fluoromonomer, and fluoropolymer liquids with minimal potential to emit.

Response: Under this rulemaking, EPA did not open the definition of fluorinated GHG for comment. However, EPA has revised the proposed leak monitoring provisions to address the commenter's observation that heavy (i.e., low vapor pressure) liquids rarely leak. Specifically, we have clarified that equipment in heavy liquid service may be excluded from monitoring, although facilities are required to estimate emissions from this equipment using another approach. For example, they could use either default emission factors or a site-specific method based on the frequency and severity of leaks observed through visual, auditory, or olfactory inspection. We have added a definition for "in heavy liquid service" as well as a complementary definition for "in light liquid service." Th latter definition defines "in light liquid service" to mean a piece of equipment in regulated material service that contains a liquid that meets the following conditions: (1) The vapor pressure of one or more of the compounds is greater than 0.3 kilopascals [2.25 mm Hg] at 20°C, (2) The total concentration of the pure compounds constituents having a vapor pressure greater than 0.3 kilopascals at 20°C is equal to or greater than 20 percent by weight of the total process stream, and (3) The fluid is a liquid at operating conditions.

Commenter Name: John Dege
Commenter Affiliation: DuPont
Document Control Number: EPA-HQ-OAR-2009-0927-0103.1
Comment Excerpt Number: 2

Comment: The definition of Research & Development needs to be modified to include pilot plants that do not sell commercial product to make a profit. EPA: In the Response to comment on subpart OO, EPA describes an exemption for R&D operations as follows: "Therefore, the final rule defines R&D as activities conducted in process units or at laboratory bench scale settings whose purpose is to conduct R&D for new processes, technologies, or products, and whose purpose is not for the manufacture of products for commercial sale, except in a de minimis manner. Comment: Pilot plants are a necessary part of efforts to develop new products in the transition from the laboratory to eventual actual commercial production. These pilot plants may also send product to potential customers for evaluation and their own product development. Sometimes, the potential customer may be charged, but the revenue is to help defray the development costs rather than for profit making for a business. Suggested change: "Research and development means those activities conducted in process units, pilot plants or at laboratory bench-scale settings whose purpose is to conduct research and development for new processes, technologies, or products and whose purpose is not for the manufacture of products for commercial sale, except in a de minimis manner."

Response: Under this rulemaking, EPA did not open the definition of research and development for comment. However, discussion of this issue may be found in the final Mandatory GHG Reporting rule at 74 FR 56285 (October 30, 2009) and in response to comments document Mandatory Greenhouse Gas Reporting Rule: EPA's Response to Public Comments, Volume No. 12, Subpart A: Applicability and Reporting Schedule.

Commenter Name: Joel R. Hall
Commenter Affiliation: Mexichem Fluor Inc.
Document Control Number: EPA-HQ-OAR-2009-0927-0104
Comment Excerpt Number: 1

Comment: The term "by-product" needs to be clearly defined in the final rule and the definition should clearly indicate that by-products in trace concentrations, as defined in §98.6, should not be included in emission calculations. The balanced chemical equation for the manufacture of HFC-134a at Mexichem's facility is: $4HF + TCE \rightarrow R134a + 3HCl$, where: HF is hydrogen fluoride, TCE is trichloroethylene, and HCl is hydrogen chloride.

Mexichem has always considered HCl to be the only by-product of the production process. Impurities are produced in our process in ppm concentrations. Neither the proposed rule nor the definitions provided under the existing §98.6 provide a definition for "by-product." The Technical Support Document (Updated) for Emissions from Production of Fluorinated Gases (March 22, 2010) provides in section 1.B., that "many reactions producing fluorinated GHGs, CFCs, and HCFCs also generate significant quantities of chemically related by-products, e.g., through over-fluorination or side reactions." HFC-143a is shown in the document to be a by-product of HFC-134a production. Mexichem considers HFC-143a to be one of the impurities in its production process. Therefore, without a clear definition, it is not obvious whether impurities produced in our process should be considered by-products.

The definitions for terms used in equations L-11 and L-12 of the proposed rule indicate that if the concentration of the by-product k is only a trace concentration, then the concentration to be used in the equation is zero. In order to avoid misunderstanding, the fact that trace concentrations of by-products should be disregarded for the purposes of calculating emissions should be clearly stated in a definition, or elsewhere, in the final rule.

Response: A definition for trace concentration is included in subpart A of part 98. EPA has added a definition for by-product to the promulgated rule as follows: "By-product means a chemical that is produced coincidentally during the production of another chemical." This means that each compound produced that is not the intended primary product is considered a by-product. In the example provided by the commenter, both the HCl and HFC-143a would be considered by-products if produced during the production process, although the HCl would not be considered a fluorinated GHG by-product; however, if the HFC-143a were present in a raw material or other input to the process and were not "produced" as a direct result of the production process, it would not be considered a by-product. (Nevertheless, it would need to be tracked if it occurred in destroyed or emitted streams in greater than trace concentrations.) As the commenter notes, if the by-product were present in a stream in trace concentrations, then the facility would not be required to monitor and track the quantity, i.e., could assume the concentration is zero. Rather than include the exemption for trace concentration in the by-product definition, EPA has included the text that excludes trace concentrations of compounds from the monitoring and calculation requirements in the appropriate places throughout the rule.

Commenter Name: Brian R. Keck
Commenter Affiliation: Air Products and Chemicals, Inc.
Document Control Number: EPA-HQ-OAR-2009-0927-0106.1
Comment Excerpt Number: 13

Comment: Further, Air Products recommends that EPA exempt constituents with concentration levels from estimation, measurement, sampling, monitoring, QA/QC, reporting, recordkeeping and other requirements of subpart L as it applies to fluorinated gas production including processes, process vents and equipment leaks. Similar to the definition of "trace constitution" in §98.6 of the final MRR, fluorinated GHG product constituents present at concentrations below 0.1 percent by mass should be exempted from the rule's requirements.

Response: A definition for trace concentration is already included in subpart A of part 98. "Trace concentration" is defined as any concentration "below 0.1 percent by mass of the process stream." EPA has explicitly exempted trace concentrations from the monitoring and calculation requirements for the initial scoping test, and for the mass balance, emission factor, and emission calculation factor approaches. Because trace concentrations are exempted from the monitoring and calculation requirements for these approaches, they are also implicitly exempted from the reporting and recordkeeping requirements for these approaches.

Commenter Name: Lorraine Krupa Gershman
Commenter Affiliation: American Chemistry Council
Comment Number: EPA-HQ-OAR-2009-0927-0092.1
Comment Excerpt Number: 9

Comment: ACC believes that EPA should exempt constituents with de minimis concentration levels from estimation, measurement, sampling, monitoring, QA/QC, reporting, recordkeeping and other requirements of subpart L as it applies to fluorinated gas production including processes, process vents and equipment leaks. Using the definition of "trace concentration " in §98.6 of the final MRR, we believe fluorinated GHG constituents present in a process stream at concentrations below 0.1 percent by mass should be exempted from the rule's requirements.

Response: Please see the response to comment EPA-HQ-OAR-2009-0927-0106.1, excerpt 13 for a discussion of the rule's treatment of trace concentrations.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 16

Comment: EPA should adopt a low-concentration floor below which reporters do not need to document FGHG content of process streams. Several process streams in fluorochemical manufacturing process units may contain a trivial amount of FGHG, causing trivial amounts of FGHG emissions. At §98.416(c) and (d) of Subpart OO, EPA defines a floor below which FGHG reporting is not required. EPA should adopt a similar guideline, based on Subpart OO conditions in effect when Subpart L reporting begins, allowing reporters to not document process streams containing less than the Subpart OO mass concentration threshold in effect when Subpart L reporting begins. Arkema expects to identify several process streams, including co-product hydrochloric acid, containing minimal FGHG concentrations that will not significantly impact actual FGHG process emissions. This minimum FGHG concentration threshold will allow reporters to concentrate on documenting FGHG contents of streams that could potentially impact actual FGHG emissions.

Response: Please see response to comment number EPA-HQ-OAR-2009-0927-0106.1, excerpt 13.

Commenter Name: John Dege
Commenter Affiliation: DuPont
Document Control Number: EPA-HQ-OAR-2009-0927-0103.1
Comment Excerpt Number: 27

Comment: The §98.124(a) concentration exemption is not clearly stated. EPA: Page 18674 of the preamble indicates the scoping study is for compounds present above 0.1%. The 0.1% exemption for the scoping study in the actual rule language was not evident. Comment: The rule's applicability section (98.122 (c)) should clarify a "trace" compound exemption. With the current definition of trace being 0.1%, low volume products (i.e., 11 tons/yr specialty fluoromonomers) with a 0.1% FGHG impurity equates to a small potential FGHG effect, particularly since many fluoromonomers have low vapor pressure, short atmospheric lifetimes, and less than 50 calculated GWP. A mass based, or calculated GWP exemption for low volume products' FGHG impurities would significantly reduce the rule's burden on low volume specialty chemical manufacturing involving insignificant CO_2e emission potential. Proposed rule changes and additions;

"§98.438. Definitions. CO_2e mass de minimus emissions – process vent CO_2e emissions of a compound less than 100 mt/yr. Use GWPs as listed on Table A-1 of subpart A, or if the compound is not listed, by alternate methodologies.

§98.122 GHGs to Report. (c) You must report the total mass of each fluorinated GHG (excluding trace constituents or compounds with CO2e mass de minimis emissions) from:…"

Response: Please see the response to comment EPA-HQ-OAR-2009-0927-0106.1, excerpt 13 for a discussion of the rule's treatment of trace concentrations.

EPA agrees that the rule text should be revised to include the trace concentration exclusion under the initial scoping test in §98.124(a). This language was inadvertently left out of the April 2010 proposal and has been included in the final rule.

No de minimis definition for CO_2 equivalent mass has been added to the rule. However, the rule includes provisions to reduce the burden of estimating emissions from low-emitting vents and processes under both the process-vent-specific emission factor approach and the mass-balance approach. Please see the discussion of process vent cutoffs under section 4.3 of this Response to Comment document.

Commenter Name: Lorraine Krupa Gershman
Commenter Affiliation: American Chemistry Council
Document Control Number: EPA-HQ-OAR-2009-0927-0092.1
Comment Excerpt Number: 35

Comment: A new definition for low-concentration constituent should be added to the definitions under this subpart similar to the definition of "trace concentration" in §98.6, i.e., a fluorinated GHG constituent in a process stream that is present in concentrations below 0.1 percent by mass.

Response: Please see the response to comment EPA-HQ-OAR-2009-0927-0106.1, excerpt 13 for a discussion of the rule's treatment of trace concentrations. EPA believes that the term "trace concentration" is adequate to address the commenter's concerns; a second term for the same concept is not necessary in the context of subpart L.

Section 10.2 Effective dates

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Document Control Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 55

Comment: Arkema is concerned that the proposed one-year Subpart L implementation schedule may be impossible to meet. Subpart L is likely the most complex Part 98 subpart to implement. Many of the proposed Subpart L monitoring, testing, and reporting requirements involve reporting facilities expending substantial engineering resources to evaluate issues of first impression. Never before has the fluorochemical industry researched FGHG emissions from manufacturing operations to this level of detail.

Proposed §98.124(m) allows reporters to petition EPA for up to a year to utilize best available monitoring methods ("BAMM") during implementation. In contrast, proposed §98.124(j) requires reporters to complete the scoping tests, emissions testing, and emission factor development, as described above, before the end of 2011. Arkema interprets these two provisions as conflicting, with the December 31, 2011 language at proposed §98.124(j) obviating the §98.124(m) BAMM provisions. Were one year adequate to complete the scoping study, the testing protocols, and LDAR program implementation, Arkema would request that EPA strike §98.124(m) and note in §98.124(j) that presumptive BAMM provides the entire 2011 calendar year to develop compliant reporting methods. However, several factors could combine to compromise our ability to complete implementation within one year. First, the required fugitive monitoring would approximately double the existing Arkema Calvert City, Kentucky LDAR program. Arkema currently manages the Calvert City LDAR system in-house, and is considering hiring an additional LDAR technician (or transferring another employee into an LDAR role). Before conducting FGHG LDAR monitoring, the facility will need to identify each component in FGHG service. To be consistent with the existing Arkema Calvert City facility LDAR program, the facility would likely “tag” each component system and register each tag, and subcomponents of each tag, into the facility LDAR database program. Arkema estimates that this process, plus the training of new LDAR technician staff, will take an entire year or more, after publication of a final Subpart L, to complete. If any externalities arise to delay LDAR implementation, compliance with §98.124(j) is at risk. Second, a limited number of source testing companies possess the requisite equipment and skill to complete FGHG testing. In our experience, most stack testers cannot identify the range of FGHG molecules that must be measured for Subpart L. These same test firms will be conducting confirmatory comprehensive performance test (“CPT”) evaluations of all regulated hazardous waste incinerators per 40 CFR 63.1207(d)(2) in late 2010 and early 2011. Arkema will not be able to fully assess the Subpart L implementation schedule until after completing the scoping tests for all of the potential FGHG emission points.

Response: To clarify the measurement schedule, EPA proposed to allow facilities until December 31, 2011 to complete initial scoping and emissions tests and to develop emission factors. There was no requirement to use or apply for BAMM to conduct emission factor measurements (e.g., stack testing) according to this schedule. This is because emission factors can be applied to 2011 activity data at any time until the reports are due to estimate 2011 emissions from each process. In the final rule, EPA is allowing facilities until February 29, 2012 to develop emission factors. This will provide facilities an additional two months to develop emission factors but will still allow facilities to report 2011 emissions using those emission factors. Again, facilities do not need to use or apply for BAMM to conduct emission factor testing according to this schedule.

In addition to giving facilities more time to complete scoping measurements and develop emission factors, we have made multiple changes to the technical requirements of the rule that we expect will make it more practicable for facilities to complete testing and other measurements by the deadlines specified in the rule. With respect to the initial scoping test, we have limited the scoping test requirement to processes that would emit more than one metric ton per year of fluorinated GHGs from any single vent before the imposition of control technologies, to avoid the need to survey a large number of processes with relatively small fluorinated GHG emissions. (Please see section 5.1 of this response to comments document for discussion of changes to the initial scoping test.) With respect to emissions factor testing, the process vent threshold has been adjusted to account for the destruction efficiency of controls and to permit use of a default GWP of 2,000 for fluorinated GHGs that do not have GWPs listed in Table A-1. (Please see the preamble to the final rule and section 4.3 of this response to comments document for discussion of changes to the process vent threshold.) With these changes to the process vent threshold, we anticipate that fewer process vents will have to be tested, and facilities will be allowed to develop emission calculation factors for a greater number of process vents. Another change to the technical requirements is that emissions factor testing is not required for batch processes, and facilities may develop emission calculation factors for these process vents. Use of calculations for determining emissions from batch process vents is consistent with requirements for batch process vents in other rules (for example, 40 CFR 63, subpart GGG and 40 CFR 63, subpart FFFF). (Please see section 4.3 for discussion of changes to the batch process vent requirements.) With respect to analysis of fluorinated GHGs that occur in process and vent streams, EPA is allowing facilities to use alternative analytical procedures to identify fluorinated GHGs and to quantify their concentrations. (Please see the preamble to the final rule for more discussion of alternative analytical methods and the requirements surrounding their use.) Finally, EPA is allowing the use of alternative monitoring approaches to monitoring of equipment leaks for fluorinated GHG in the promulgated rule. (Please see section II.E, Fluorinated Gas Production (Subpart L) of the preamble to this rule for discussion of equipment leak monitoring alternatives.)

To alleviate any remaining undue hardship on the industry, EPA has included additional flexibility in the subpart L BAMM provisions. These provisions are intended, for example, to minimize unplanned shutdowns and to accommodate multiple facilities trying to simultaneously obtain measurement services from a relatively limited pool of vendors. Please see the preamble to the final rule for a detailed discussion of the BAMM provisions and how they would apply to the different emission estimation methods and parameters; a brief overview of the BAMM timelines is provided below.

In the final rule, facilities may use BAMM to estimate emissions that occur through June 30, 2011 without submitting a request to EPA. (Note that this initial BAMM does not affect the due date for completion of scoping measurements, emission factors, and emission characterizations, which is February 29, 2012. However, it does affect the date by which, for example, flow meters meeting specific accuracy and precision requirements must be acquired, installed and operated.) To use BAMM to estimate emissions that occur beyond June 30, 2011, facilities must submit a petition and EPA must approve it. The due dates for the petition and for the completion of measurements depend on the type of measurement being conducted.

Facilities wishing to use BAMM to estimate emissions that occur throughout 2011 for parameters other than scoping speciation, emission factors, and emission characterizations must submit a request to EPA by February 28, 2011. If the petition is granted, these facilities must begin operating the required monitoring equipment by January 1, 2012. Facilities wishing to use BAMM to estimate emissions that occur throughout 2011 for scoping speciation, emission factors, and emission characterizations must submit a petition to EPA by June 30, 2011. If the petition is granted, these facilities must complete necessary measurements by February 28, 2013. EPA is also reserving the right to approve use of BAMM to estimate emissions that occur after 2011 under unique and extreme circumstances which include safety, technical infeasibility, or inconsistency with other local, State or Federal regulations.

By allowing more time to complete measurements (even without BAMM), allowing additional flexibility in the methods that may be used to characterize and estimate emissions, and allowing extension of the use BAMM under limited circumstances, we believe that we have made appropriate accommodations for the challenges faced by the facilities subject to subpart L in estimating their fluorinated GHG emissions while ensuring that estimates are reasonably timely, accurate, and precise.

Commenter Name: Joel R. Hall
Commenter Affiliation: Mexichem Fluor Inc.
Document Control Number: EPA-HQ-OAR-2009-0927-0104
Comment Excerpt Number: 6

Comment: Comment #5: Allow the use of Best Available Monitoring Methods (BAMM) under §98.3(d)(1) through (3) through the end of calendar year 2012. Mexichem initially understood §98.124(m) to mean that BAMM could be used for the entire calendar year 2011. However, during a telephone call with EPA staff, Mexichem learned that, as proposed BAMM would only be able to be used for the first three months of calendar year 2011. However, it would not apply to the initial scoping study, emissions testing, etc. required under §98.124. Mexichem is requesting that the use of BAMM be allowed through the end of calendar year 2012. Mexichem's preference is to use the mass balance approach for estimating its emissions. In the event that Mexichem needs to upgrade measurement and/or monitoring equipment in order to achieve the error criteria of §98.123(a) (if the agency retains the requirement to calculate these errors) it will likely need a plant shutdown to install such equipment. Currently, our next scheduled plant shutdown is during the fourth quarter of 2012. Requiring us to meet the error criteria after March 31, 2011 would cause undue financial hardship and upset to our business in the form of unscheduled shutdowns or unplanned capital expenditures.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0085.1, excerpt 55.

Commenter Name: Joel R. Hall
Commenter Affiliation: Mexichem Fluor Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0104
Comment Excerpt Number: 7

Comment: Does §98.124(m) negate the need to meet the error criteria of §98.123(a)? §98.124(m) states that for calendar year 2011 monitoring, you may follow the provisions of §98.3(d)(1) through (3) for best available monitoring methods rather than follow the monitoring requirements of this section. §98.124(b) states that if you use the mass balance method, you must conduct monthly mass measurements …. that allow the facility to meet the error criteria in §98.123(a). It can be inferred that §98.124(m) allows the use of monitoring methods that do not meet the error criteria in §98.123(a). This should be clarified in the final rule.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0085.1, excerpt 55. Please see section II.E.3 of the preamble to this rule for a response to the comments regarding BAMM provisions as they apply to the mass-balance approach.

Commenter Name: Dave Stirpe
Commenter Affiliation: Alliance for Responsible Atmospheric Policy
Document Control Number: EPA-HQ-OAR-2009-0927-0117.1
Comment Excerpt Number: 13

Comment: The Alliance also appreciates EPA allowing best available monitoring methods for the entire 2011 calendar year. It appears that EPA appreciates the large amount of preparation, monitoring, and recordkeeping that each reporting facility must establish to comply with proposed Subpart L. However, we are concerned that a one-year implementation period may not be adequate. The companies needed the entire three-year MACT implementation period to roll out emissions standards that required far less testing and far less-reaching LDAR requirements than the proposed Subpart L will impose on the same process units. Many member companies have determined that they will have to conduct process unit shutdowns to install testing ports to conduct required stack testing on units that rarely shut down. Many member facilities may run out of time before completing the required testing programs and before implementing the extensive LDAR programs. The Alliance requests that EPA allow facilities to petition for additional time to implement Subpart L, consistent with the extension petition system EPA used for Subpart OO for this calendar year.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0085.1, excerpt 55.

Commenter Name: Dave Stripe
Commenter Affiliation: Alliance for Responsible Atmospheric Policy
Comment Number: EPA-HQ-OAR-2009-0927-0067
Comment Excerpt Number: 4

Comment: The Alliance appreciates EPA allowing best available monitoring methods for the entire 2011 calendar year since there’s a large amount of preparation, monitoring and record keeping, that each reporting facility must establish to comply with proposed Subpart L. However, some may be concerned that a one-year implementation period may not be adequate.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0085.1, excerpt 55.

Commenter Name: Jeff C. Muffat
Commenter Affiliation: 3M Center
Document Control Number: EPA-HQ-OAR-2009-0927-0111.1
Comment Excerpt Number: 18

Comment: The proposed rule requires completion of scoping testing, process emissions testing, and emission factor development by December 31, 2011. We request that EPA provide a five year period for this work, with the most significant sources being addressed during the first year. 3M estimates that the cost of completing this work will easily exceed $2MM. EPA's response to our comments could increase or decrease this estimate. For this estimate, we have assumed that the Subpart L analytical language will be aligned with what has been developed for Subpart OO and that work will not be required to synthesize chemicals that would be used to quantify unknowns. We do not believe that a testing program of this magnitude could be accomplished in the one-year time frame for the following reasons:

1. The costs and number of tests required is extensive. Highly trained personnel and specialized equipment will be required. 3M has developed close working relationships with third party contractors that conduct source testing at its manufacturing locations. In most cases, the same test equipment and personnel would be required to complete the testing specified for equipment leaks.

2. Whereas testing for continuous process vents can typically be completed in a short period of time, e.g. three one-hour tests, testing for batch processes could take weeks to complete due to extended batch cycles and due to the potential for an additional three tests.

3. A project of this scope will be better managed if individual tests are conducted over an extended time period. Extensive preplanning will be required. Lessons learned as a part of early testing efforts can be used to refine and improve subsequent tests. If the implementation period is extended, costs can be distributed evenly over an extended time period. Any retesting would fall into the same five year cycle.

Finally, EPA should provide relief where unusual circumstances prevent the completion of this work in the required time period.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0085.1, excerpt 55.

Commenter Name: John Dege
Commenter Affiliation: DuPont
Document Control Number: EPA-HQ-OAR-2009-0927-0103.1
Comment Excerpt Number: 36

Comment: Section 98.124(j) states: "Initial scoping testing, emissions testing and emissions factor development must be completed by December 31, 2011." Two years from promulgation will be needed to complete emission factor determinations per §98.123(b). Section 98.124(j) requires that all work be completed by December 2011. However, many units have long run times between shutdowns. As such, we request the ability to utilize engineering calculations for three years. Economic conditions drive the frequency that batch products are produced. Many facilities have 2 year cycle for shut-downs. It is not economical or reasonable to require a forced shut-down.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0085.1, excerpt 55.

Commenter Name: Lorraine Krupa Gershman
Commenter Affiliation: American Chemistry Council
Document Control Number: EPA-HQ-OAR-2009-0927-0092.1
Comment Excerpt Number: 14

Comment: This section requires that all work be completed by December 2011. However, many units have long run times between shutdowns. As such, we request the ability to utilize engineering calculations for three years.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0085.1, excerpt 55.

Commenter Name: Rich Raiders
Commenter Affiliation: Arkema Inc.
Document Control Number: EPA-HQ-OAR-2009-0927-0085.1
Comment Excerpt Number: 57

Comment: We are unsure if adequate technology exists to perform the analyses required to meet EPA's comprehensive GHG inventory goals. EPA should recognize that Subpart L, more so than other Part 98 source categories, is by necessity technology forcing. Previously, EPA has recognized when it engages in technology forcing regulation by providing additional time (three years in the Maximum Achievable Control Technology program at 40 CFR 63). EPA should break with the Part 98 one year implementation precedent for the Subpart L source category and provide reporters the opportunity to petition the agency for a second year of BAMM reporting. EPA should also utilize the petition process to allow reporters the opportunity to resolve emerging technology issues that will need to be addressed during implementation.

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0085.1, excerpt 55. EPA believes that the BAMM language and process can accommodate situations where the rule may be technology forcing.

Section 10.3 Other

Commenter Name: Jeff C. Muffat
Commenter Affiliation: 3M Center
Document Control Number: EPA-HQ-OAR-2009-0927-0111.1
Comment Excerpt Number: 1

Comment: The various companies and facilities that are included in this source category represent one of the most diverse collections of manufacturing operations that are covered under the Mandatory Reporting Rule (MRR). There have been various references to the Misc. Organic NESPHAP's (MON) MACT standards during the rulemaking process. There are many types of manufacturing operations, including batch, continuous, and combined processes, containing varying amounts of the reportable materials and in varying quantities. We continue to encourage EPA to provide this source category with as much flexibility as possible in preparing and managing their emission information. Most companies have very evolved emission tracking programs which should be leveraged as much possible. If quality control requirements have not been addressed by specific rule language, 3M has created the necessary architecture. A summary paragraph from our most recent third party audit that was conducted as a part of EPA's Climate Leaders program is provided below: "In summary, due to the unique nature of the chemical processes operated by 3M, GHG emissions cannot be estimated using published protocols. 3M has however expended great effort to collect theoretical and empirical data on the emissions from the processes, and the destruction of emissions accomplished by the emissions control technology. It has also developed, and documented in its IMP, a rigorous process for tracking activity data and applying appropriate emission factors. CH2M HILL has performed a detailed review of this information in its initial 3rd party verification effort for the complete 2002 inventory, and again in review of the 2007 and interim year chemical process emission inventories. CH2M HILL's conclusion is that 3M's chemical process emission inventory is free of material misstatement and suitable for the intended purpose of public disclosure of its reduction to its total U.S. and global GHG emission inventories." (1)

Response: Please see the response to comment number EPA-HQ-OAR-2009-0927-0085.1, excerpt 55 for a discussion of the additional flexibility to reporters that is being provided in the final rule compared to the April 2010 proposal. The final rule also adopts important flexibility provisions that were already included in the April 2010 proposal, for example, allowing facilities to choose between two different estimation methods (emission factor and mass-balance) and allowing use of less rigorous methods for smaller emission sources (e.g., the calculation methods adopted from the Miscellaneous Organic NESHAP and the Pharmaceutical NESHAP for vents emitting less than 10,000 mtCO_2e annually) . EPA believes that the final rule appropriately balances flexibility with accuracy, timeliness, and consistency among facilities in the rigor with which they estimate emissions from sources of similar sizes.

Commenter Name: Brian R. Keck
Commenter Affiliation: Air Products and Chemicals, Inc.
Comment Number: EPA-HQ-OAR-2009-0927-0106.1
Comment Excerpt Number: 6

Comment: Allow greater flexibility consistent with the objective for a reasonably accurate annual inventory report.

Response: Please see the response to comment EPA-HQ-OAR-2009-0927-0111.1, excerpt 1.

Commenter Name: Lorraine Krupa Gershman
Commenter Affiliation: American Chemistry Council
Comment Number: EPA-HQ-OAR-2009-0927-0092.1
Comment Excerpt Number: EPA-HQ-OAR-2009-0927-DRAFT-0093-1

Comment: However, we are disappointed that this re-proposed subpart L is still too prescriptive. Fluorinated GHG production is complex, and numerous production processes are frequently located at the same plant. Having EPA prescribe calculation and monitoring methods removes the ability for sources to develop new protocols that better calculate the emissions from their facilities. Affected sources should be allowed to develop site-specific protocols for emissions measuring and monitoring, and detail such protocols in the required GHG Monitoring Plan.

Response: Please see the response to comment EPA-HQ-OAR-2009-0927-0111.1, excerpt 1.

Commenter Name: Craig Holt Segall
Commenter Affiliation: Sierra Club
Document Control Number: EPA-HQ-OAR-2009-0927-0128.1
Comment Excerpt Number: 10

Comment: American industry produces hundreds of thousands of tons of fluorinated gases, including HFCs, PFC, SF_6, NF_3, HFEs, CFCs, and HCFCs annually – on the order of 440,000 tons a year, according to EPA.[2] These gases, if emitted, would translate into hundreds of millions of tons of CO_2.[3] Happily, most of this material does not leak into the atmosphere from production facilities. But even at the fairly conservative leakage rate of between 1-1.5% annually that EPA estimates, combined production emissions reach 10.6 million $mtCO_2e$ annually.[4] If leaks are more significant, or the average GWP of leaked gases is higher than EPA believes, these emissions may be even larger. Thus, EPA must require rigorous reporting from this industry. The proposed rule can be strengthened to this end.

Response: EPA appreciates your comment. EPA believes that the final rule appropriately balances the accuracy, timeliness, and consistency of emission estimates with flexibility and practicality for reporters. We discuss our responses to your specific recommendations in the preamble of the rule and elsewhere in this response to comments document.

Commenter Name: Lorraine Krupa Gershman
Commenter Affiliation: American Chemistry Council
Document Control Number: EPA-HQ-OAR-2009-0927-0092.1
Comment Excerpt Number: 25

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[2] Fluorinated Gas TSD at 4.
[3] Id.
[4] Id.

Comment: The rule [in subpart 98.123(d)] states that sources shall "Estimate annually the total mass of fluorinated GHG emissions from process vents in either paragraph (c)(3) or (c)(4) of this section, as appropriate, and from equipment leak emissions in paragraph (d) using Equation L–25 of this section." The numbering appears to be in error, and the "(c)(3) or (c)(4)" should be "(b)(3) or (b)(4)", and the "paragraph (d)" should be "paragraph (c)."

Response: The EPA agrees with this comment and has corrected the references in §98.123(d) in the promulgated rule.

Commenter Name: John Dege
Commenter Affiliation: DuPont
Comment Number: EPA-HQ-OAR-2009-0927-0103.1
Comment Excerpt Number: 22

Comment: Apparent Typographical error in section 98.123(d) needs to be corrected. EPA: Section 98.123(d) states "Estimate annually the total mass of fluorinated GHG emissions from process vents in either paragraph (c)(3) or (c)(4) of this section, as appropriate, and from equipment leak emissions in paragraph (d) using Equation L–25 of this section." Comment: The numbering appears to be in error, and the "(c)(3) or (c)(4)" should be "(b)(3) or (b)(4)", and the "paragraph (d)" should be "paragraph (c)".

Response: Please see response for comment number EPA-HQ-OAR-2009-0927-0092.1, excerpt 25.