Register. This action is not a "major rule" as defined by 5 U.S.C. 804(2). This rule will be effective on [INSERT THE DATE 30 DAYS AFTER THE DATE OF PUBLICATION IN THE FEDERAL REGISTER].

List of Subjects

40 CFR Part 86

Environmental protection, Administrative practice and procedure, Air pollution control, Reporting and recordkeeping requirements, Motor vehicle pollution.

40 CFR Part 98

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

Dated: Oct 7, 2010

Lisa P. Jackson,
Administrator.

For the reasons set out in the preamble, title 40, Chapter I, of the Code of Federal Regulations is amended as follows:

PART 86–[AMENDED]

1. The authority citation for part 86 continues to read as follows:

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

2. Section 86.1844-01 is amended by adding paragraph (j) to read as follows:

§86.1844-01 Information requirements: Application for certification and submittal of information upon request.

*   *   *   *   *

(j) For complete heavy-duty vehicles only, measure CO_2, N_2O, and CH_4 as described in this paragraph (j) with each certification test on an emission data vehicle. Do not apply deterioration factors to the results. Use the analytical equipment and procedures specified in 40 CFR part 1065 as needed to measure N_2O and CH_4. Report these values in your application for certification. The requirements of this paragraph (j) apply starting with model year 2011 for CO_2 and 2012 for CH_4. The requirements of this paragraph (j) related to N_2O emissions apply for test groups that depend on NO_x after-treatment to meet emission standards starting with model year 2013.

Businesses that are defined as a small business by the Small Business Administration size standards in 13 CFR 121.201 may omit measurement of N_2O and CH_4; other manufacturers may provide appropriate data and/or information and omit measurement of N_2O and CH_4 as described in 40 CFR 1065.5. Use the same measurement methods as for your other results to report a single value for CO_2, N_2O, and CH_4. Round the final values as follows:

(1) Round CO_2 to the nearest 1 g/mi.

(2) Round N_2O to the nearest 0.001 g/mi.

(3) Round CH_4 to the nearest 0.001 g/mi.

Part 98—[AMENDED]

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

Authority: 42 U.S.C. 7401, et seq.

Subpart A—[Amended]

4. Section 98.6 is amended by:

a. Removing the definition of “Argon-oxygen decarburization (AOD) vessel.”

b. Adding a definition for “Decarburization vessel.”

c. Revising the definitions of “Carbonate-based mineral,” “Carbonate-based mineral mass fraction,” “Carbonate-based raw material,” “Crude oil,” “Gas collection system or landfill gas collection system," "Mscf," and "Non-crude feedstocks."

§98.6 Definitions.

* * * * *

Carbonate-based mineral means any of the following minerals used in the manufacture of glass: calcium carbonate ($CaCO_3$), calcium magnesium carbonate ($CaMg(CO_3)_2$), sodium carbonate (Na_2CO_3), barium carbonate ($BaCO_3$), potassium carbonate (K_2CO_3), lithium carbonate (Li_2CO_3), and strontium carbonate ($SrCO_3$).

Carbonate-based mineral mass fraction means the following: for limestone, the mass fraction of calcium carbonate ($CaCO_3$) in the limestone; for dolomite, the mass fraction of calcium magnesium carbonate ($CaMg(CO_3)_2$) in the dolomite; for soda ash, the mass fraction of sodium carbonate (Na_2CO_3) in the soda ash; for barium carbonate, the mass fraction of barium carbonate ($BaCO_3$) in the barium carbonate; for potassium carbonate, the mass fraction of potassium carbonate (K_2CO_3) in the potassium carbonate; for lithium carbonate, the mass fraction of lithium carbonate (Li_2CO_3); and for strontium carbonate, the mass fraction of strontium carbonate ($SrCO_3$).

Carbonate-based raw material means any of the following materials used in the manufacture of glass: limestone, dolomite, soda ash, barium carbonate, potassium carbonate, lithium carbonate, and strontium carbonate.

*   *   *   *   *

Crude oil means a mixture of hydrocarbons that exists in liquid phase in natural underground reservoirs and remains liquid at atmospheric pressure after passing through surface separating facilities. Depending upon the characteristics of the crude stream, it may also include any of the following:

(1) Small amounts of hydrocarbons that exist in gaseous phase in natural underground reservoirs but are liquid at atmospheric conditions (temperature and pressure) after being recovered from oil well (casing-head) gas in lease separators and are subsequently commingled with the crude stream without being separately measured. Lease condensate recovered as a liquid from natural gas wells in lease or field separation facilities and later mixed into the crude stream is also included.

(2) Small amounts of non-hydrocarbons, such as sulfur and various metals.

(3) Drip gases, and liquid hydrocarbons produced from tar sands, oil sands, gilsonite, and oil shale.

(4) Petroleum products that are received or produced at a refinery and subsequently injected into a crude supply or reservoir by the same refinery owner or operator.

Liquids produced at natural gas processing plants are excluded. Crude oil is refined to produce a wide array of petroleum products, including heating oils; gasoline, diesel and jet fuels; lubricants; asphalt; ethane, propane, and butane; and many other products used for their energy or chemical content.

* * * * *

Decarburization vessel means any vessel used to further refine molten steel with the primary intent of reducing the carbon content of the steel, including but not limited to vessels used for argon-oxygen decarburization and vacuum oxygen decarburization.

* * * * *

Gas collection system or landfill gas collection system means a system of pipes used to collect landfill gas from different locations in the landfill by means of a fan or similar mechanical draft equipment to a single location for treatment (thermal destruction) or use. Landfill gas collection systems may also include knock-out or separator drums and/or a compressor. A single landfill may have multiple gas collection systems. Landfill gas collection systems do not include “passive” systems, whereby landfill gas flows naturally to the surface of the landfill where an opening or pipe (vent) is installed to allow for natural gas flow.

*   *   *   *   *

Mscf means thousand standard cubic feet.

*   *   *   *   *

Non-crude feedstocks means any petroleum product or natural gas liquid that enters the refinery to be further refined or otherwise used on site.

*   *   *   *   *

5. Section 98.7 is amended by removing and reserving paragraph (a), and adding paragraph (e)(46).

§98.7 What standardized methods are incorporated by reference into this part?

*   *   *   *   *

(e) *   *   *

(46) ASTM D6349-09 Standard Test Method for Determination of Major and Minor Elements in Coal, Coke, and Solid Residues from Combustion of Coal and Coke by Inductively Coupled Plasma—Atomic Emission Spectrometry, IBR approved for §98.144(b).

*   *   *   *   *

Subpart E—[Amended]

6. Section 98.53 is revised to read as follows:

§98.53 Calculating GHG emissions.

(a) You must determine annual N_2O emissions from adipic acid production according to paragraphs (a)(1) or (a)(2) of this section.

(1) Use a site-specific emission factor and production data according to paragraphs (b) through (i) of this section.

(2) Request Administrator approval for an alternative method of determining N_2O emissions according to paragraphs (a)(2)(i) and (a)(2)(ii) of this section.

(i) You must submit the request within 45 days following promulgation of this subpart or within the first 30 days of each subsequent reporting year.

(ii) If the Administrator does not approve your requested alternative method within 150 days of the end of the reporting year, you must determine the N_2O emissions for the current reporting period using the procedures specified in paragraphs (b) through (h) of this section.

(b) You must conduct an annual performance test according to paragraphs (b)(1) through (b)(3) of this section.

(1) You must conduct the test on the vent stream from the nitric acid oxidation step of the process, referred to

as the test point, according to the methods specified in §98.54(b) through (f). If multiple adipic acid production units exhaust to a common abatement technology and/or emission point, you must sample each process in the ducts before the emissions are combined, sample each process when only one process is operating, or sample the combined emissions when multiple processes are operating and base the site-specific emission factor on the combined production rate of the multiple adipic acid production units.

(2) You must conduct the performance test under normal process operating conditions.

(3) You must measure the adipic acid production rate during the test and calculate the production rate for the test period in metric tons per hour.

(c) Using the results of the performance test in paragraph (b) of this section, you must calculate an emission factor for each adipic acid unit according to Equation E-1 of this section:

$$EF_{N2O,z} = \frac{\sum_{1}^{n} \frac{C_{N2O} * 1.14\times 10^{-7} * Q}{P}}{n} \qquad \text{(Eq. E-1)}$$

Where:

$EF_{N2O,z}$ = Average facility-specific N_2O emission factor for each adipic acid production unit “z” (lb N_2O/ton adipic acid produced).

C_{N2O} = N_2O concentration per test run during the performance test (ppm N_2O).

$1.14x10^{-7}$ = Conversion factor (lb/dscf-ppm N_2O).

Q = Volumetric flow rate of effluent gas per test run during the performance test (dscf/hr).

P = Production rate per test run during the performance test (tons adipic acid produced/hr).

n = Number of test runs.

(d) If any N_2O abatement technology “N” is located after your test point, you must determine the destruction efficiency according to paragraphs (d)(1), (d)(2), or (d)(3) of this section.

(1) Use the manufacturer’s specified destruction efficiency.

(2) Estimate the destruction efficiency through process knowledge. Examples of information that could constitute process knowledge include calculations based on material balances, process stoichiometry, or previous test results provided the results are still relevant to the current vent stream conditions. You must document how process knowledge was used to determine the destruction efficiency.

(3) Calculate the destruction efficiency by conducting an additional performance test on the vent stream following the N_2O abatement technology.

(e) If any N_2O abatement technology “N” is located after your test point, you must determine the annual amount of adipic acid produced while N_2O abatement technology “N” is operating according to §98.54(f). Then you must calculate the abatement factor for N_2O abatement technology “N” according to Equation E-2 of this section.

$$AF_N = \frac{P_{a,N}}{P_z} \qquad \text{(Eq. E-2)}$$

Where:

AF_N = Abatement utilization factor of N_2O abatement technology “N” (fraction of annual production that abatement technology is operating).

$P_{z,N}$ = Annual adipic acid production during which N_2O abatement technology “N” was used on unit “z” (ton adipic acid produced).

P_z = Total annual adipic acid production from unit “z” (ton acid produced).

(f) You must determine the annual amount of adipic acid produced according to §98.54(f).

(g) You must calculate N_2O emissions according to paragraph (g)(1), (g)(2), (g)(3), or (g)(4) of this section for each adipic acid production unit.

(1) If one N_2O abatement technology “N” is located after your test point, you must use the emissions factor

(determined in Equation E-1 of this section), the destruction efficiency (determined in paragraph (d) of this section), the annual adipic acid production (determined in paragraph (f) of this section), and the abatement utilization factor (determined in paragraph (e) of this section), according to Equation E-3a of this section:

$$E_{a,z} = \frac{EF_{N20,z} * P_z}{2205} * (1 - (DF * AF)) \qquad \text{(Eq. E-3a)}$$

Where:

$E_{a,z}$ = Annual N_2O mass emissions from adipic acid production unit “z” according to this Equation E-3a (metric tons).

EF_{N2Oz} = N_2O emissions factor for unit “z” (lb N_2O/ton adipic acid produced).

P_z = Annual adipic acid produced from unit “z” (tons).

DF = Destruction efficiency of N_2O abatement technology “N” (percent of N_2O removed from vent stream).

AF = Abatement utilization factor of N_2O abatement technology “N” (percent of time that the abatement technology is operating).

2205 = Conversion factor (lb/metric ton).

(2) If multiple N_2O abatement technologies are located in series after your test point, you must use the emissions factor (determined in Equation E-1 of this section), the destruction efficiency (determined in paragraph (d) of this section), the annual adipic acid production (determined in paragraph (f) of this section), and the abatement

utilization factor (determined in paragraph (e) of this section), according to Equation E-3b of this section:

$$E_{b,z} = \frac{EF_{N20,z} * P_z}{2205} * (1 - (DF_1 * AF_1)) * (1 - (DF_2 * AF_2)) * \ldots * (1 - (DF_N * AF_N)) \quad \text{(Eq. E-3b)}$$

Where:

$E_{b,z}$ = Annual N_2O mass emissions from adipic acid production unit "z" according to this Equation E-3b (metric tons).

$EF_{N2O,z}$ = N_2O emissions factor for unit "z" (lb N_2O/ton adipic acid produced).

P_z = Annual adipic acid produced from unit "z" (tons).

DF_1 = Destruction efficiency of N_2O abatement technology 1 (percent of N_2O removed from vent stream).

AF_1 = Abatement utilization factor of N_2O abatement technology 1 (percent of time that abatement technology 1 is operating).

DF_2 = Destruction efficiency of N_2O abatement technology 2 (percent of N_2O removed from vent stream).

AF_2 = Abatement utilization factor of N_2O abatement technology 2 (percent of time that abatement technology 2 is operating).

DF_N = Destruction efficiency of N_2O abatement technology N (percent of N_2O removed from vent stream).

AF_N = Abatement utilization factor of N_2O abatement technology N (percent of time that abatement technology N is operating).

2205 = Conversion factor (lb/metric ton).

N = Number of different N_2O abatement technologies.

(3) If multiple N_2O abatement technologies are located in parallel after your test point, you must use the

emissions factor (determined in Equation E-1 of this section), the destruction efficiency (determined in paragraph (d) of this section), the annual adipic acid production (determined in paragraph (f) of this section), and the abatement utilization factor (determined in paragraph (e) of this section), according to Equation E-3c of this section:

$$E_{c,z} = \frac{EF_{N20,z} * P_z}{2205} * \sum_{1}^{N}((1-(DF_N * AF_N)) * FC_N) \quad \text{(Eq. E-3c)}$$

Where:

$E_{c,z}$ = Annual N_2O mass emissions from adipic acid production unit “z” according to this Equation E-3c (metric tons).

$EF_{N2O,z}$ = N_2O emissions factor for unit “z” (lb N_2O/ton adipic acid produced).

P_z = Annual adipic acid produced from unit “z” (tons).

DF_N = Destruction efficiency of N_2O abatement technology “N” (percent of N_2O removed from vent stream).

AF_N = Abatement utilization factor of N_2O abatement technology “N”(percent of time that the abatement technology is operating).

FC_N = Fraction control factor of N_2O abatement technology “N” (percent of total emissions from unit “z” that are sent to abatement technology “N”).

2205 = Conversion factor (lb/metric ton).

N = Number of different N_2O abatement technologies with a fraction control factor.

(4) If no N_2O abatement technologies are located after your test point, you must use the emissions factor

(determined using Equation E-1 of this section) and the annual adipic acid production (determined in paragraph (f) of this section) according to Equation E-3d of this section for each adipic acid production unit.

$$E_{d,z} = \frac{EF_{N20} * P_z}{2205} \quad \text{(Eq. E-3d)}$$

Where:

$E_{d,z}$ = Annual N_2O mass emissions from adipic acid production for unit “z” according to this Equation E-3d (metric tons).

EF_{N2O} = N_2O emissions factor for unit “z” (lb N_2O/ton adipic acid produced).

P_Z = Annual adipic acid produced from unit “z” (tons).

2205 = Conversion factor (lb/metric ton).

(h) You must determine the emissions for the facility by summing the unit level emissions according to Equation E-4 of this section.

$$N_2O = \sum_{z=1}^{M} E_{a,z} + E_{b,z} + E_{c,z} + E_{d,z} \quad \text{(Eq. E-4)}$$

Where:

$E_{a,z}$ = Annual N_2O mass emissions from adipic acid production unit “z” according to Equation E-3a of this section (metric tons).

$E_{b,z}$ = Annual N_2O mass emissions from adipic acid production unit “z” according to Equation E-3b of this section (metric tons).

$E_{c,z}$ = Annual N_2O mass emissions from adipic acid production unit “z” according to Equation E-3c of this section (metric tons).

$E_{d,z}$ = Annual N_2O mass emissions from adipic acid production unit “z” according to Equation E-3d of this section (metric tons).

M = Total number of adipic acid production units.

(i) You must determine the amount of process N_2O emissions that is sold or transferred off site (if applicable). You can determine the amount using existing process flow meters and N_2O analyzers.

7. Section 98.54 is amended by:

a. Revising paragraph (a) introductory text.

b. Adding second and third sentences to the end of paragraph (a)(1).

c. Revising paragraph (a)(3).

d. Revising paragraph (c) introductory text.

e. Revising the first sentence of paragraph (d) introductory text.

f. Revising paragraphs (e) and (f).

§98.54 Monitoring and QA/QC requirements.

(a) You must conduct a new performance test and calculate a new emissions factor for each adipic acid production unit according to the frequency specified in paragraphs (a)(1) through (a)(3) of this section.

(1) * * * The test must be conducted at a point during production that is representative of the average emissions rate from your process. You must document the methods used to determine the representative point.

*   *   *   *   *

(3) If you requested Administrator approval for an alternative method of determining N_2O emissions under §98.53(a)(2), you must conduct the performance test if your request has not been approved by the Administrator within 150 days of the end of the reporting year in which it was submitted.

*   *   *   *   *

(c) You must determine the adipic acid production rate during the performance test according to paragraph (c)(1) or (c)(2) of this section.

*   *   *   *   *

(d) You must determine the volumetric flow rate during the performance test in conjunction with the applicable EPA methods in 40 CFR part 60, appendices A-1 through A-4. * * *

*   *   *   *   *

(e) You must determine the monthly amount of adipic acid produced. You must also determine the monthly amount of adipic acid produced during which N_2O abatement technology, located after the test point, is operating. These monthly amounts are determined according to the methods in paragraphs (c)(1) or (c)(2) of this section.

(f) You must determine the annual amount of adipic acid produced. You must also determine the annual amount of adipic acid produced during which N_2O abatement technology located after the test point is operating. These are determined by summing the respective monthly adipic acid production quantities determined in paragraph (e) of this section.

8. Section 98.56 is amended by:

a. Revising the introductory text

b. Revising paragraph (c).

c. Revising paragraph (j) introductory text.

d. Revising paragraph (j)(1).

e. Revising paragraph (k) introductory text.

f. Adding paragraph (l)

§98.56 Data reporting requirements.

In addition to the information required by §98.3(c), each annual report must contain the information specified in paragraphs (a) through (l) of this section at the facility level.

* * * * *

(c) Annual adipic acid production during which N_2O abatement technology (located after the test point) is operating (tons).

* * * * *

(j) If you conducted a performance test and calculated a site-specific emissions factor according to §98.53(a)(1), each annual report must also contain the information specified in paragraphs (j)(1) through (j)(7) of this section for each adipic acid production unit.

(1) Emission factor (lb N_2O/ton adipic acid).

* * * * *

(k) If you requested Administrator approval for an alternative method of determining N_2O emissions under §98.53(a)(2), each annual report must also contain the information specified in paragraphs (k)(1) through (k)(4) of this section for each adipic acid production facility.

(l) Fraction control factor for each abatement technology (percent of total emissions from the production unit that are sent to the abatement technology) if equation E-3c is used.

* * * * *

9. Section 98.57 is amended by revising paragraphs (c) and (f) to read as follows:

<u>§98.57 Records that must be retained.</u>

* * * * *

(c) Number of facility and unit operating hours in calendar year.

* * * * *

(f) Performance test reports.

* * * * *

Subpart H—[Amended]

10. Section 98.83 is amended by revising the introductory text of paragraph (d)(3); and by revising the definitions of “rm”, “TOCrm”, and “M” in Equation H-5 of paragraph (d)(3) to read as follows:

§98.83 Calculating GHG emissions.

* * * * *

(d) * * *

(3) CO$_2$ emissions from raw materials. Calculate CO$_2$ emissions from raw materials using Equation H-5 of this section:

* * * * *

rm = The amount of raw material i consumed annually, tons/yr (dry basis) or the amount of raw kiln feed consumed annually, tons/yr (dry basis).

* * * * *

TOCrm = Organic carbon content of raw material i or organic carbon content of combined raw kiln feed(dry basis), as determined in §98.84(c) or using a default factor of 0.2 percent of total raw material weight.

M = Number of raw materials or 1 if calculating emissions based on combined raw kiln feed.

* * * * *

11. Section 98.84 is amended as follows:

a. By revising paragraph (b).

b. By revising paragraph (c).

c. By revising paragraph (d).

d. By revising paragraph (e).

e. By revising paragraph (f).

§98.84 Monitoring and QA/QC requirements.

* * * * *

(b) You must determine the weight fraction of total CaO and total MgO in clinker from each kiln using ASTM C114-09 Standard Test Methods for Chemical Analysis of Hydraulic Cement (incorporated by reference, see §98.7). The monitoring must be conducted monthly for each kiln from a monthly clinker sample drawn from bulk clinker storage if storage is dedicated to the specific kiln, or from a monthly arithmetic average of daily clinker samples drawn from the clinker conveying systems exiting each kiln.

(c) The total organic carbon content (dry basis) of raw materials must be determined annually using ASTM C114-09 Standard Test Methods for Chemical Analysis of Hydraulic Cement (incorporated by reference, see §98.7) or a similar industry standard practice or method approved for total organic carbon determination in raw mineral materials. The analysis must be conducted either on sample material drawn from bulk raw kiln feed storage or on sample material drawn from bulk raw material storage for each category of raw material (i.e., limestone, sand, shale, iron oxide, and alumina). Facilities that opt to use the default total organic carbon factor provided in §98.83(d)(3), are not required to monitor for TOC.

(d) The quantity of clinker produced monthly by each kiln must be determined by direct weight measurement of clinker using the same plant techniques used for accounting purposes, such as reconciling weigh hopper or belt weigh feeder measurements against inventory measurements. As an alternative, facilities may also determine clinker production by direct measurement of raw kiln feed and application of a kiln-specific feed-to-clinker factor. Facilities that opt to use a feed-to-clinker factor must verify the accuracy of this factor on a monthly basis.

(e) The quantity of CKD not recycled to the kiln generated by each kiln must be determined quarterly using the same plant techniques used for accounting purposes, such as direct weight measurement using weigh hoppers, truck weigh scales, or belt weigh feeders.

(f) The annual quantity of raw kiln feed or annual quantity of each category of raw materials consumed by the facility (e.g., limestone, sand, shale, iron oxide, and alumina) must be determined monthly by direct weight measurement using the same plant instruments used for accounting purposes, such as weigh hoppers, truck weigh scales, or belt weigh feeders.

*   *   *   *   *

12. Section 98.86 is amended by:

a. Revising paragraph (b)(3).

b. Revising paragraph (b)(4).

c. Revising paragraph (b)(12).

d. Revising paragraph (b)(13).

e. Adding paragraph (b)(15).

§98.86 Data reporting requirements.

*   *   *   *   *

(b) *   *   *

(3) Annual cement production at the facility.

(4) Number of kilns and number of operating kilns.

*   *   *   *   *

(12) Annual organic carbon content of raw kiln feed or annual organic carbon content of each raw material (wt-fraction, dry basis).

(13) Annual consumption of raw kiln feed or annual consumption of each raw material (dry basis).

*   *   *   *   *

(15) Method used to determine the monthly clinker production from each kiln reported under (b)(2) of this

section, including monthly kiln-specific clinker factors, if used.

13. Section 98.87 is revised to read as follows:

§98.87 Records that must be retained.

(a) If a CEMS is used to measure CO_2 emissions, then in addition to the records required by §98.3(g), you must retain under this subpart the records required for the Tier 4 Calculation Methodology in §98.37.

(b) If a CEMS is not used to measure CO_2 emissions, then in addition to the records required by §98.3(g), you must retain the records specified in paragraph (b) of this section for each portland cement manufacturing facility.

(1) Documentation of monthly calculated kiln-specific clinker CO_2 emission factor.

(2) Documentation of quarterly calculated kiln-specific CKD CO_2 emission factor.

(3) Measurements, records and calculations used to determine reported parameters.

Subpart K—[Amended]

14. Section 98.112 is amended by revising paragraph (a) to read as follows:

§98.112 GHGs to report.

* * * * *

(a) Process CO_2 emissions from each electric arc furnace (EAF) used for the production of any ferroalloy listed in §98.110, and process CH_4 emissions from each EAF that is used for the production of any ferroalloy listed in Table K-1 to subpart K.

*   *   *   *   *

15. Section 98.113 is amended by revising the introductory text to read as follows:

§98.113 Calculating GHG emissions.

You must calculate and report the annual process CO_2 emissions from each EAF not subject to paragraph (c) of this section using the procedures in either paragraph (a) or (b) of this section. For each EAF also subject to annual process CH_4 emissions reporting, you must also calculate and report the annual process CH_4 emissions from the EAF using the procedures in paragraph (d) of this section.

*   *   *   *   *

16. Section 98.116 is amended by:

a. Revising paragraph (b).

b. Revising paragraph (c).

c. Revising paragraph (d) introductory text.

d. Revising paragraph (d)(1).

e. Revising paragraph (e)(1).

§98.116 Data reporting requirements.

*   *   *   *   *

(b) Annual production for each ferroalloy product identified in §98.110, from each EAF (tons).

(c) Total number of EAFs at facility used for production of ferroalloy products.

(d) If a CEMS is used to measure CO_2 emissions, then you must report under this subpart the relevant information required by §98.36 for the Tier 4 Calculation Methodology and the following information specified in paragraphs (d)(1) through (d)(3) of this section.

(1) Annual process CO_2 emissions (in metric tons) from each EAF used for the production of any ferroalloy product identified in §98.110.

* * * * *

(e) * * *

(1) Annual process CO_2 emissions (in metric tons) from each EAF used for the production of any ferroalloy identified in §98.110 (metric tons).

* * * * *

Subpart N—[Amended]

17. Section 98.144 is amended by revising paragraph (b) to read as follows:

§98.144 Monitoring and QA/QC requirements.

* * * * *

(b) You must measure carbonate-based mineral mass fractions at least annually to verify the mass fraction data provided by the supplier of the raw material; such measurements shall be based on sampling and chemical analysis using ASTM D3682-01 (Reapproved 2006) Standard Test Method for Major and Minor Elements in Combustion Residues from Coal Utilization Processes (incorporated by reference, see §98.7) or ASTM D6349-09 Standard Test Method for Determination of Major and Minor Elements in Coal, Coke, and Solid Residues from Combustion of Coal and Coke by Inductively Coupled Plasma—Atomic Emission Spectrometry (incorporated by reference, see §98.7).

* * * * *

18. Section 98.146 is amended by:

a. Revising paragraph (a) introductory text.

b. Revising paragraph (a)(2).

c. Revising paragraph (b)(7).

d. Revising paragraph (b)(9).

§98.146 Data reporting requirements.

* * * * *

(a) If a CEMS is used to measure CO_2 emissions, then you must report under this subpart the relevant information required under §98.36 for the Tier 4 Calculation

Methodology and the following information specified in paragraphs (a)(1) and (a)(2) of this section:

*   *   *   *   *

(2) Annual quantity of glass produced by each glass melting furnace and by all furnaces combined (tons).

(b) *   *   *

(7) Method used to determine fraction of calcination.

*   *   *   *   *

(9) The number of times in the reporting year that missing data procedures were followed to measure monthly quantities of carbonate-based raw materials or mass fraction of the carbonate-based minerals for any continuous glass melting furnace (months).

19. Table N-1 to subpart N is amended by adding entries for “Barium carbonate,” “Potassium carbonate,” “Lithium carbonate,” and “Strontium carbonate” to the end of the table to read as follows:

Table N-1 to Subpart N—CO_2 Emission Factors for Carbonate-Based Raw Materials

Carbonate-Based Raw Material – Mineral	CO_2 Emission Factor[a]
* * * * * * *	
Barium carbonate – $BaCO_3$	0.223
Potassium carbonate – K_2CO_3	0.318
Lithium carbonate (Li_2CO_3)	0.596
Strontium carbonate ($SrCO_3$)	0.298

[a] Emission factors in units of metric tons of CO_2 emitted per metric ton of carbonate-based raw material charged to the furnace.

Subpart O—[Amended]

20. Section 98.154 is amended by:

a. Revising the first and second sentence of paragraph (k).

b. Revising the second sentence of paragraph (l) introductory text.

c. Revising paragraph (o).

§98.154 Monitoring and QA/QC requirements.

* * * * *

(k) The mass of HFC-23 emitted from process vents shall be estimated at least monthly by incorporating the results of the most recent emissions test into Equation O-7 of this subpart. HCFC-22 production facilities that use a destruction device connected to the HCFC-22 production equipment shall conduct emissions tests at process vents at least once every five years or after significant changes to the process. * * *

(l) * * * HFC-23 destruction facilities shall conduct annual measurements of HFC-23 concentrations at the outlet of the destruction device in accordance with EPA Method 18 at 40 CFR part 60, appendix A-6. * * *

* * * * *

(o) In their estimates of the mass of HFC-23 destroyed, HFC-23 destruction facilities shall account for any temporary reductions in the destruction efficiency that result from any startups, shutdowns, or malfunctions of the destruction device, including departures from the operating conditions defined in State or local permitting requirements and/or destruction device manufacturer specifications.

*   *   *   *   *

21. Section 98.156 is amended by:

a. Revising paragraph (b)(1).

b. Revising paragraph (b)(3).

c. Revising paragraph (c).

d. Revising paragraph (d).

e. Adding paragraph (e) introductory text.

§98.156 Data reporting requirements.

*   *   *   *   *

(b) *   *   *

(1) Annual mass of HFC-23 fed into the destruction device.

*   *   *   *   *

(3) Annual mass of HFC-23 emitted from the destruction device.

(c) Each HFC-23 destruction facility shall report the concentration (mass fraction) of HFC-23 measured at the outlet of the destruction device during the facility’s annual HFC-23 concentration measurements at the outlet of the device.

(d) If the HFC-23 concentration measured pursuant to §98.154(l) is greater than that measured during the performance test that is the basis for the destruction efficiency (DE), the facility shall report the revised destruction efficiency calculated under §98.154(l) and the values used to calculate it, specifying whether §98.154(l)(1) or §98.154(l)(2) has been used for the calculation. Specifically, the facility shall report the following:

(1) Flow rate of HFC-23 being fed into the destruction device in kg/hr.

(2) Concentration (mass fraction) of HFC-23 at the outlet of the destruction device.

(3) Flow rate at the outlet of the destruction device in kg/hr.

(4) Emission rate (in kg/hr) calculated from paragraphs (d)(2) and (d)(3) of this section.

(5) Destruction efficiency (DE) calculated from paragraphs (d)(1) and (d)(4) of this section.

(e) By March 31, 2011 or within 60 days of commencing HFC-23 destruction, HFC-23 destruction facilities shall submit a one-time report including the following information for each destruction process:

*   *   *   *   *

22. Section 98.157 is amended by revising paragraph (b)(1) to read as follows:

§98.157 Records that must be retained.

*   *   *   *   *

(b) *   *   *

(1) Records documenting their one-time and annual reports in §98.156(b) through (e).

*   *   *   *   *

Subpart P—[Amended]

23. Section 98.160 is amended by revising paragraph (c) to read as follows:

§98.160 Definition of the source category.

*   *   *   *   *

(c) This source category includes merchant hydrogen production facilities located within another facility if they are not owned by, or under the direct control of, the other facility’s owner and operator.

24. Section 98.162 is amended by revising paragraph (a); and by removing and reserving paragraph (b) to read as follows:

§98.162 GHGs to report.

*   *   *   *   *

(a) CO_2 emissions from each hydrogen production process unit.

(b) [Reserved]

*   *   *   *   *

25. Section 98.163 is amended by:

a. Revising the introductory text.

b. Revising paragraph (a).

c. Revising paragraph (b) introductory text.

d. In paragraph (b)(1), revising the only sentence, and revising the definition of “CO_2” in Equation P-1.

e. Revising the only sentences of paragraphs (b)(2) and (b)(3).

§98.163 Calculating GHG emissions.

You must calculate and report the annual CO_2 emissions from each hydrogen production process unit using the procedures specified in either paragraph (a) or (b) of this section.

(a) Continuous Emissions Monitoring Systems (CEMS). Calculate and report under this subpart the CO_2 emissions by operating and maintaining CEMS according to the Tier 4 Calculation Methodology specified in §98.33(a)(4) and all associated requirements for Tier 4 in subpart C of this part (General Stationary Fuel Combustion Sources).

(b) Fuel and feedstock material balance approach. Calculate and report CO_2 emissions as the sum of the annual emissions associated with each fuel and feedstock used for hydrogen production by following paragraphs (b)(1) through (b)(3) of this section.

(1) Gaseous fuel and feedstock. You must calculate the annual CO_2 emissions from each gaseous fuel and feedstock according to Equation P-1 of this section:

* * * * *

CO_2 = Annual CO_2 emissions arising from fuel and feedstock consumption (metric tons/yr).

* * * * *

(2) Liquid fuel and feedstock. You must calculate the annual CO_2 emissions from each liquid fuel and feedstock according to Equation P-2 of this section:

* * * * *

(3) Solid fuel and feedstock. You must calculate the annual CO_2 emissions from each solid fuel and feedstock according to Equation P-3 of this section:

* * * * *

26. Section 98.166 is amended by:

a. Revising the introductory text.

b. Revising paragraph (a)(1).

c. Revising paragraph (b)(1).

d. Revising paragraph (c).

§98.166 Data reporting requirements.

In addition to the information required by §98.3(c), each annual report must contain the information specified in paragraphs (a) or (b) of this section, as appropriate, and paragraphs (c) and (d) of this section:

(a) *   *   *

(1) Unit identification number and annual CO_2 emissions.

*   *   *   *   *

(b) *   *   *

(1) Unit identification number and annual CO_2 emissions.

*   *   *   *   *

(c) Quantity of CO_2 collected and transferred off site in either gas, liquid, or solid forms, following the requirements of subpart PP of this part.

*   *   *   *   *

Subpart Q—[Amended]

27. Section 98.172 is amended by revising paragraphs (b) and (c) to read as follows:

§98.172 GHGs to report.

*   *   *   *   *

(b) You must report CO_2 emissions from flares that burn blast furnace gas or coke oven gas according to the procedures in §98.253(b)(1) of subpart Y (Petroleum Refineries) of this part. When using the alternatives set forth in §98.253(b)(1)(ii)(B) and §98.253(b)(1)(iii)(C), you must use the default CO_2 emission factors for coke oven gas and blast furnace gas from Table C-1 to subpart C in Equations Y-2 and Y-3 of subpart Y. You must report CH_4 and N_2O emissions from flares according to the requirements in §98.33(c)(2) using the emission factors for coke oven gas and blast furnace gas in Table C-2 to subpart C of this part.

(c) You must report process CO_2 emissions from each taconite indurating furnace; basic oxygen furnace; non-recovery coke oven battery combustion stack; coke pushing process; sinter process; EAF; decarburization vessel; and direct reduction furnace by following the procedures in this subpart.

28. Section 98.173 is amended by:

a. Revising the first sentence of the introductory text.

b. In paragraph (b)(1)(vi), revising the introductory text and the definition of “CO_2” in Equation Q-6 of subpart Q.

c. Revising the first sentence of paragraph (d).

§98.173 Calculating GHG emissions.

You must calculate and report the annual process CO_2 emissions from each taconite indurating furnace, basic oxygen furnace, non-recovery coke oven battery, sinter process, EAF, decarburization vessel, and direct reduction furnace using the procedures in either paragraph (a) or (b) of this section. * * *

(b) * * *

(1) * * *

(vi) For decarburization vessels, estimate CO_2 emissions using Equation Q-6 of this section.

* * * * *

CO_2 = Annual CO_2 mass emissions from the decarburization vessel (metric tons).

* * * * *

(d) If GHG emissions from a taconite indurating furnace, basic oxygen furnace, non-recovery coke oven battery, sinter process, EAF, decarburization vessel, or direct reduction furnace are vented through the same stack as any combustion unit or process equipment that reports CO_2 emissions using a CEMS that complies with the Tier 4 Calculation Methodology in subpart C of this part (General Stationary Fuel Combustion Sources), then the calculation methodology in paragraph (b) of this section shall not be used to calculate process emissions. * * *

29. Section 98.174 is amended by revising the first sentence of paragraph (c)(2) and revising paragraph (c)(7) to read as follows:

§98.174 Monitoring and QA/QC requirements.

* * * * *

(c) * * *

(2) For the furnace exhaust from basic oxygen furnaces, EAFs, decarburization vessels, and direct reduction furnaces, sample the furnace exhaust for at least three complete production cycles that start when the furnace is being charged and end after steel or iron and slag have been tapped. * * *

* * * * *

(7) If your EAF and decarburization vessel exhaust to a common emission control device and stack, you must sample each process in the ducts before the emissions are combined, sample each process when only one process is operating, or sample the combined emissions when both processes are operating and base the site-specific emission factor on the steel production rate of the EAF.

* * * * *

30. Section 98.175 is amended by revising the introductory text to read as follows:

§98.175 Procedures for estimating missing data.

A complete record of all measured parameters used in the GHG emissions calculations in §98.173 is required. Therefore, whenever a quality-assured value of a required parameter is unavailable, a substitute data value for the missing parameter shall be used in the calculations as specified in the paragraphs (a) and (b) of this section. You must follow the missing data procedures in §98.255(b) of subpart Y (Petroleum Refineries) of this part for flares burning coke oven gas or blast furnace gas. You must document and keep records of the procedures used for all such estimates.

* * * * *

31. Section 98.176 is amended by:

a. Revising the introductory text.

b. Revising paragraph (c).

c. Revising paragraph (e)(3).

d. Adding paragraphs (g) and (h).

§98.176 Data reporting requirements.

In addition to the information required by §98.3(c), each annual report must contain the information required in paragraphs (a) through (h) of this section for each coke pushing operation; taconite indurating furnace; basic oxygen furnace; non-recovery coke oven battery; sinter process; EAF; decarburization vessel; direct reduction furnace; and flare burning coke oven gas or blast furnace gas. For reporting year 2010, the information required in paragraphs (a) through (h) of this section is not required for decarburization vessels that are not argon-oxygen decarburization vessels. For reporting year 2011 and each subsequent reporting year, the information in paragraphs (a) through (h) of this section must be reported for all decarburization vessels.

*   *   *   *   *

(c) If a CEMS is used to measure CO_2 emissions, then you must report the relevant information required under §98.36 for the Tier 4 Calculation Methodology.

*   *   *   *   *

(e) *   *   *

(3) The annual volume of each type of gaseous fuel (reported separately for each type in standard cubic feet), the annual volume of each type of liquid fuel (reported separately for each type in gallons), and the annual mass (in metric tons) of each other process inputs and outputs used to determine CO_2 emissions.

*   *   *   *   *

(g) The annual amount of coal charged to the coke ovens (in metric tons).

(h) For flares burning coke oven gas or blast furnace gas, the information specified in §98.256(e) of subpart Y (Petroleum Refineries) of this part.

32. Section 98.177 is amended by revising paragraph (d) to read as follows:

§98.177 Records that must be retained.

* * * * *

(d) Annual operating hours for each taconite indurating furnace, basic oxygen furnace, non-recovery coke oven battery, sinter process, electric arc furnace, decarburization vessel, and direct reduction furnace.

* * * * *

Subpart S—[Amended]

33. Section 98.190 is amended by revising paragraph (a) to read as follows:

§98.190 Definition of the source category.

(a) Lime manufacturing plants (LMPs) engage in the manufacture of a lime product (e.g., calcium oxide, high-calcium quicklime, calcium hydroxide, hydrated lime, dolomitic quicklime, dolomitic hydrate, or other lime products) by calcination of limestone, dolomite, shells or other calcareous substances as defined in 40 CFR 63.7081(a)(1).

* * * * *

34. Section 98.193 is amended by:

a. In paragraph (b)(2)(i), revising the second sentence and the definition of "2000/2205" in Equation S-1.

b. In paragraph (b)(2)(ii), revising the only sentence and the definitions of "$EF_{LKD,i,n}$", "$CaO_{LKD,i,n}$", "$MgO_{LKD,i,n}$", and "2000/2205" in Equation S-2.

c. In paragraph (b)(2)(iii), revising the only sentence and the definitions of "$E_{waste,i}$", "$CaO_{waste,i}$", "$MgO_{waste,i}$", "$M_{waste,i}$", and "2000/2205" in Equation S-3.

d. In Paragraph (b)(2)(iv), revising the definitions of "$EF_{LIME,i,n}$", "$M_{LIME,i,n}$", "$EF_{LKD,i,n}$", "$M_{LKD,i,n}$", "$E_{waste,i}$", "t", "b", and "z" in Equation S-4.

§98.193 Calculating GHG emissions.

* * * * *

(b) * * *

(2) * * *

(i) * * * Calcium oxide and magnesium oxide content must be analyzed monthly for each lime product type that is produced:

* * * * *

2000/2205 = Conversion factor for tons to metric tons.

(ii) You must calculate a monthly emission factor for each type of calcined byproduct/waste sold (including lime kiln dust) using Equation S-2 of this section:

* * * * *

$EF_{LKD,i,n}$ = Emission factor for calcined lime byproduct/waste type i sold, for month n (metric tons CO_2/ton lime byproduct).

* * * * *

$CaO_{LKD,i,n}$ = Calcium oxide content for calcined lime byproduct/waste type i sold, for month n (metric tons CaO/metric ton lime).

$MgO_{LKD,i,n}$ = Magnesium oxide content for calcined lime byproduct/waste type i sold, for month n (metric tons MgO/metric ton lime).

2000/2205 = Conversion factor for tons to metric tons.

(iii) You must calculate the annual CO_2 emissions from each type of calcined byproduct/waste that is not sold (including lime kiln dust and scrubber sludge) using Equation S-3 of this section:

* * * * *

$E_{waste,i}$ = Annual CO_2 emissions for calcined lime byproduct/waste type i that is not sold (metric tons CO_2).

* * * * *

$CaO_{waste,i}$ = Calcium oxide content for calcined lime byproduct/waste type i that is not sold (metric tons CaO/metric ton lime).

$MgO_{waste,i}$ = Magnesium oxide content for calcined lime byproduct/waste type i that is not sold (metric tons MgO/metric ton lime).

$M_{waste,i}$ = Annual weight or mass of calcined byproducts/wastes for lime type i that is not sold (tons).

2000/2205 = Conversion factor for tons to metric tons.

(iv) * * * * *

$EF_{LIME,i,n}$ = Emission factor for lime type i produced, in calendar month n (metric tons CO_2/ton lime) from Equation S-1 of this section.

$M_{LIME,i,n}$ = Weight or mass of lime type i produced in calendar month n (tons).

$EF_{LKD,i,n}$ = Emission factor of calcined byproducts/wastes sold for lime type i in calendar month n, (metric tons CO_2/ton byproduct/waste) from Equation S-2 of this section.

$M_{LKD,i,n}$ = Monthly weight or mass of calcined byproducts/waste sold (such as lime kiln dust, LKD) for lime type i in calendar month n (tons).

$E_{waste,i}$ = Annual CO_2 emissions for calcined lime byproduct/waste type i that is not sold (metric tons CO_2) from Equation S-3 of this section.

t = Number of lime types produced

b = Number of calcined byproducts/wastes that are sold

z = Number of calcined byproducts/wastes that are not sold

* * * * *

35. Section 98.194 is amended by:

a. Revising the first sentence of paragraph (a).

b. Revising paragraph (c) introductory text.

c. Revising paragraph (d).

§98.194 Monitoring and QA/QC requirements.

(a) You must determine the total quantity of each type of lime product that is produced and each calcined byproduct/waste (such as lime kiln dust) that is sold.* * *

* * * * *

(c) You must determine the chemical composition (percent total CaO and percent total MgO) of each type of lime product that is produced and each type of calcined byproduct/waste sold according to paragraph (c)(1) or (c)(2) of this section. You must determine the chemical composition of each type of lime product that is produced and each type of calcined byproduct/waste sold on a monthly basis. You must determine the chemical composition for each type of calcined byproduct/waste that is not sold on an annual basis.

* * * * *

(d) You must use the analysis of calcium oxide and magnesium oxide content of each lime product that is produced and that is collected during the same month as the production data in monthly calculations.

* * * * *

36. Section 98.195 is amended by revising the first sentence of the introductory text; and by revising paragraph (a) to read as follows:

§98.195 Procedures for estimating missing data.

For the procedure in §98.193(b)(1), a complete record of all measured parameters used in the GHG emissions calculations is required (e.g., oxide content, quantity of lime products, etc.). * * *

(a) For each missing value of the quantity of lime produced (by lime type), and quantity of calcined byproduct/waste produced and sold, the substitute data value shall be the best available estimate based on all available process data or data used for accounting purposes.

* * * * *

37. Section 98.196 is revised to read as follows:

§98.196 Data reporting requirements.

In addition to the information required by §98.3(c), each annual report must contain the information specified in paragraphs (a) or (b) of this section, as applicable.

(a) If a CEMS is used to measure CO_2 emissions, then you must report under this subpart the relevant information required by §98.36 and the information listed in paragraphs (a)(1) through (a)(8) of this section.

(1) Method used to determine the quantity of lime that is produced and sold.

(2) Method used to determine the quantity of calcined lime byproduct/waste sold.

(3) Beginning and end of year inventories for each lime product that is produced, by type.

(4) Beginning and end of year inventories for calcined lime byproducts/wastes sold, by type.

(5) Annual amount of calcined lime byproduct/waste sold, by type (tons).

(6) Annual amount of lime product sold, by type (tons).

(7) Annual amount of calcined lime byproduct/waste that is not sold, by type (tons).

(8) Annual amount of lime product not sold, by type (tons).

(b) If a CEMS is not used to measure CO_2 emissions, then you must report the information listed in paragraphs (b)(1) through (b)(17) of this section.

(1) Annual CO_2 process emissions from all kilns combined (metric tons).

(2) Monthly emission factors for each lime type produced.

(3) Monthly emission factors for each calcined byproduct/waste by lime type that is sold.

(4) Standard method used (ASTM or NLA testing method) to determine chemical compositions of each lime type produced and each calcined lime byproduct/waste type.

(5) Monthly results of chemical composition analysis of each type of lime product produced and calcined byproduct/waste sold.

(6) Annual results of chemical composition analysis of each type of lime byproduct/waste that is not sold.

(7) Method used to determine the quantity of lime produced and/or lime sold.

(8) Monthly amount of lime product sold, by type (tons).

(9) Method used to determine the quantity of calcined lime byproduct/waste sold.

(10) Monthly amount of calcined lime byproduct/waste sold, by type (tons).

(11) Annual amount of calcined lime byproduct/waste that is not sold, by type (tons).

(12) Monthly weight or mass of each lime type produced (tons).

(13) Beginning and end of year inventories for each lime product that is produced.

(14) Beginning and end of year inventories for calcined lime byproducts/wastes sold.

(15) Annual lime production capacity (tons) per facility.

(16) Number of times in the reporting year that missing data procedures were followed to measure lime production (months) or the chemical composition of lime products sold (months).

(17) Indicate whether CO_2 was used on-site (i.e. for use in a purification process). If CO_2 was used on-site, provide the information in paragraphs (b)(17)(i) and (b)(17)(ii) of this section.

(i) The annual amount of CO_2 captured for use in the on-site process.

(ii) The method used to determine the amount of CO_2 captured.

Subpart V—[Amended]

38. Section 98.223 is amended by:

a. Revising paragraphs (a)(1) and (a)(2)(ii).

b. Revising paragraph (b) introductory text.

c. Revising paragraphs (b)(1) and (b)(2).

d. Revising paragraph (c).

e. Revising paragraph (d) introductory text.

f. Revising paragraph (e).

g. Removing and reserving paragraph (f).

h. Revising paragraph (g).

i. Adding paragraph (i).

§98.223 Calculating GHG emissions.

(a) * * *

(1) Use a site-specific emission factor and production data according to paragraphs (b) through (i) of this section.

(2) * * *

(ii) If the Administrator does not approve your requested alternative method within 150 days of the end of the reporting year, you must determine the N_2O emissions for the current reporting period using the procedures specified in paragraph (a)(1) of this section.

(b) You must conduct an annual performance test for each nitric acid train according to paragraphs (b)(1) through (b)(3) of this section.

(1) You must conduct the performance test at the absorber tail gas vent, referred to as the test point, for each nitric acid train according to §98.224(b) through (f). If multiple nitric acid production units exhaust to a common abatement technology and/or emission point, you must sample each process in the ducts before the emissions are combined, sample each process when only one process is operating, or sample the combined emissions when multiple processes are operating and base the site-specific emission factor on the combined production rate of the multiple nitric acid production units.

(2) You must conduct the performance test under normal process operating conditions.

* * * * *

(c) Using the results of the performance test in paragraph (b) of this section, you must calculate an average site-specific emission factor for each nitric acid train "t" according to Equation V-1 of this section:

$$EF_{N2Ot} = \frac{\sum_{1}^{n} \frac{C_{N2O} \ast 1.14 \times 10^{-7} \ast Q}{P}}{n} \qquad \text{(Eq. V-1)}$$

Where:

EF_{N2Ot} = Average site-specific N_2O emissions factor for nitric acid train "t" (lb N_2O/ton nitric acid produced, 100 percent acid basis).

C_{N2O} = N_2O concentration for each test run during the performance test (ppm N_2O).

1.14×10^{-7} = Conversion factor (lb/dscf-ppm N_2O).

Q = Volumetric flow rate of effluent gas for each test run during the performance test (dscf/hr).

P = Production rate for each test run during the performance test (tons nitric acid produced per hour, 100 percent acid basis).

n = Number of test runs.

(d) If nitric acid train "t" exhausts to any N_2O abatement technology "N" after the test point, you must determine the destruction efficiency for each N_2O abatement technology "N" according to paragraphs (d)(1), (d)(2), or (d)(3) of this section.

* * * * *

(e) If nitric acid train "t" exhausts to any N_2O abatement technology "N" after the test point, you must determine the annual amount of nitric acid produced on train “t” while N_2O abatement technology “N” is operating according to §98.224(f). Then you must calculate the abatement utilization factor for each N_2O abatement technology “N” for each nitric acid train “t” according to Equation V-2 of this section.

$$AF_{t,N} = \frac{P_{t,N}}{P_t} \qquad \text{(Eq. V-2)}$$

Where:

$AF_{t,N}$ = Abatement utilization factor of N_2O abatement technology “N” at nitric acid train “t” (fraction of annual production that abatement technology is operating).

P_t = Total annual nitric acid production from nitric acid train “t” (ton acid produced, 100 percent acid basis).

$P_{a,t,N}$ = Annual nitric acid production from nitric acid train “t” during which N_2O abatement technology “N” was operational (ton acid produced, 100 percent acid basis).

(f) [Reserved]

(g) You must calculate N_2O emissions for each nitric acid train “t” according to paragraph (g)(1), (g)(2), (g)(3), or (g)(4) of this section.

(1) If nitric acid train “t” exhausts to one N_2O abatement technology “N” after the test point, you must use the emissions factor (determined in Equation V-1 of this section), the destruction efficiency (determined in paragraph (d) of this section), the annual nitric acid

production (determined in paragraph (i) of this section), and the abatement utilization factor (determined in paragraph (e) of this section) according to Equation V-3a of this section:

$$E_{N2Ot} = \frac{EF_{N2Ot} * P_t}{2205} * (1 - (DF * AF)) \qquad \text{(Eq. V-3a)}$$

Where:

E_{N2Ot} = Annual N_2O mass emissions from nitric acid production unit “t” according to this Equation V-3a (metric tons).

EF_{N2Ot} = Average site-specific N_2O emissions factor for nitric acid train ”t” (lb N_2O/ton acid produced, 100 percent acid basis).

P_t = Annual nitric acid production from the train “t” (ton acid produced, 100 percent acid basis).

DF = Destruction efficiency of N_2O abatement technology N that is used on nitric acid train “t” (percent of N_2O removed from vent stream).

AF = Abatement utilization factor of N_2O abatement technology “N” for nitric acid train “t” (percent of time that the abatement technology is operating).

2205 = Conversion factor (lb/metric ton).

(2) If multiple N_2O abatement technologies are located in series after your test point, you must use the emissions factor (determined in Equation V-1 of this section), the destruction efficiency (determined in paragraph (d) of this section), the annual nitric acid production (determined in paragraph (f) of this section), and the abatement utilization factor (determined in paragraph (e) of this section), according to Equation V-3b of this section:

$$E_{N2Ot} = \frac{EF_{N20,t} * P_t}{2205} * (1 - (DF_1 * AF_1)) * (1 - (DF_2 * AF_2)) * ... * (1 - (DF_N * AF_N)) \quad \text{(Eq. V-3b)}$$

Where:

E_{N2Ot} = Annual N_2O mass emissions from nitric acid production unit "t" according to this Equation V-3b (metric tons).

$EF_{N2O,t}$ = N_2O emissions factor for unit "t" (lb N_2O/ton nitric acid produced).

P_t = Annual nitric acid produced from unit "t" (ton acid produced, 100 percent acid basis).

DF_1 = Destruction efficiency of N_2O abatement technology 1 (percent of N_2O removed from vent stream).

AF_1 = Abatement utilization factor of N_2O abatement technology 1 (percent of time that abatement technology 1 is operating).

DF_2 = Destruction efficiency of N_2O abatement technology 2 (percent of N_2O removed from vent stream).

AF_2 = Abatement utilization factor of N_2O abatement technology 2 (percent of time that abatement technology 2 is operating).

DF_N = Destruction efficiency of N_2O abatement technology N (percent of N_2O removed from vent stream).

AF_N = Abatement utilization factor of N_2O abatement technology N (percent of time that abatement technology N is operating).

2205 = Conversion factor (lb/metric ton).

N = Number of different N_2O abatement technologies.

(3) If multiple N_2O abatement technologies are located in parallel after your test point, you must use the emissions factor (determined in Equation V-1 of this section), the destruction efficiency (determined in

paragraph (d) of this section), the annual nitric acid production (determined in paragraph (f) of this section), and the abatement utilization factor (determined in paragraph (e) of this section), according to Equation V-3c of this section:

$$E_{N2Ot} = \frac{EF_{N20,t} * P_t}{2205} * \sum_{1}^{N} ((1 - (DF_N * AF_N)) * FC_N) \quad \text{(Eq. V-3c)}$$

Where:

E_{N2Ot} = Annual N_2O mass emissions from nitric acid production unit “t” according to this Equation V-3c (metric tons).

$EF_{N2O,t}$ = N_2O emissions factor for unit “t” (lb N_2O/ton nitric acid produced).

P_t = Annual nitric acid produced from unit “t” (ton acid produced, 100 percent acid basis).

DF_N = Destruction efficiency of N_2O abatement technology “N” (percent of N_2O removed from vent stream).

AF_N = Abatement utilization factor of N_2O abatement technology “N” (percent of time that abatement technology “N” is operating).

FC_N = Fraction control factor of N_2O abatement technology “N” (percent of total emissions from unit “t” that are sent to abatement technology “N”).

2205 = Conversion factor (lb/metric ton).

N = Number of different N_2O abatement technologies with a fraction control factor.

(4) If nitric acid train “t” does not exhaust to any N_2O abatement technology after the test point, you must use the emissions factor (determined in Equation V-1 of this

section), and the annual nitric acid production (determined in paragraph (i) of this section) according to Equation V-3b of this section:

$$E_{N_2Ot} = \frac{EF_{N20t} * P_t}{2205} \qquad \text{(Eq. V-3d)}$$

Where:

E_{N2Ot} = Annual N_2O mass emissions from nitric acid production unit “t” according to this Equation V-3d (metric tons).

EF_{N2Ot} = Average site-specific N_2O emissions factor for nitric acid train ”t” (lb N_2O/ton acid produced, 100 percent acid basis).

P_t = Annual nitric acid production from nitric acid train “t” (ton acid produced, 100 percent acid basis).

2205 = Conversion factor (lb/metric ton).

*   *   *   *   *

(i) You must determine the total annual amount of nitric acid produced on nitric acid train “t” for each nitric acid train (tons acid produced, 100 percent acid basis), according to §98.224(f).

39. Section 98.224 is amended by:

a. Revising paragraph (a).

b. Revising the first sentence in paragraph (d) introductory text.

c. Revising paragraphs (e) and (f).

<u>§98.224 Monitoring and QA/QC requirements.</u>

(a) You must conduct a new performance test according to a test plan as specified in paragraphs (a)(1) through (a)(3) of this section.

(1) Conduct the performance test annually. The test should be conducted at a point during the campaign which is representative of the average emissions rate from the nitric acid campaigns. Facilities must document the methods used to determine the representative point of the campaign when the performance test is conducted.

(2) Conduct the performance test when your nitric acid production process is changed, specifically when abatement equipment is installed.

(3) If you requested Administrator approval for an alternative method of determining N_2O emissions under §98.223(a)(2), you must conduct the performance test if your request has not been approved by the Administrator within 150 days of the end of the reporting year in which it was submitted.

* * * * *

(d) You must determine the volumetric flow rate during the performance test in conjunction with the applicable EPA methods in 40 CFR part 60, appendices A-1 through A-4. * * *

* * * * *

(e) You must determine the total monthly amount of nitric acid produced. You must also determine the monthly amount of nitric acid produced while N_2O abatement technology (located after the test point) is operating from each nitric acid train. These monthly amounts are determined according to the methods in paragraphs (c)(1) or (c)(2) of this section.

(f) You must determine the annual amount of nitric acid produced. You must also determine the annual amount of nitric acid produced while N_2O abatement technology (located after the test point) is operating for each train. These annual amounts are determined by summing the respective monthly nitric acid quantities determined in paragraph (e) of this section.

40. Section 98.226 is amended by:

a. Revising the introductory text.

b. Revising paragraph (g).

c. Revising paragraph (m) introductory text.

d. Revising paragraph (n) introductory text.

e. Adding paragraph (p).

§98.226 Data reporting requirements.

In addition to the information required by §98.3(c), each annual report must contain the information specified in paragraphs (a) through (p) of this section.

*   *   *   *   *

(g) Number of different N_2O abatement technologies per nitric acid train “t”.

*   *   *   *   *

(m) If you conducted a performance test and calculated a site-specific emissions factor according to §98.223(a)(1), each annual report must also contain the information specified in paragraphs (m)(1) through (m)(7) of this section.

*   *   *   *   *

(n) If you requested Administrator approval for an alternative method of determining N_2O emissions under §98.223(a)(2), each annual report must also contain the information specified in paragraphs (n)(1) through (n)(4) of this section.

*   *   *   *   *

(p) Fraction control factor for each abatement technology (percent of total emissions from the production unit that are sent to the abatement technology) if equation V-3c is used.

*   *   *   *   *

Subpart Z—[Amended]

41. Section 98.263 is amended by revising paragraph (b)(1) to read as follows:

§98.263 Calculating GHG emissions.

* * * * *

(b) * * *

(1) Calculate the annual CO_2 mass emissions from each wet-process phosphoric acid process line using the methods in paragraphs (b)(1)(i) or (b)(1)(ii) of this section, as applicable.

(i) If your process measurement provides the inorganic carbon content of phosphate rock as an output, calculate and report the process CO_2 emissions from each wet-process phosphoric acid process line using Equation Z-1a of this section:

$$E_m = \sum_{i=1}^{b}\sum_{n=1}^{z} (IC_{n,i} * P_{n,i}) * \frac{2000}{2205} * \frac{44}{12} \qquad \text{(Eq. Z-1a)}$$

Where:

E_m = Annual CO_2 mass emissions from a wet-process phosphoric acid process line m according to this Equation Z-1a (metric tons).

$IC_{n,i}$ = Inorganic carbon content of a grab sample batch of phosphate rock by origin i obtained during month n, from the carbon analysis results (percent by weight, expressed as a decimal fraction).

$P_{n,i}$ = Mass of phosphate rock by origin i consumed in month n by wet-process phosphoric acid process line m (tons).

z = Number of months during which the process line m operates.

b = Number of different types of phosphate rock in month, by origin. If the grab sample is a composite sample of rock from more than one origin, b=1.

2000/2205 = Conversion factor to convert tons to metric tons.

44/12 = Ratio of molecular weights, CO_2 to carbon.

(ii) If your process measurement provides the CO_2 emissions directly as an output, calculate and report the process CO_2 emissions from each wet-process phosphoric acid process line using Equation Z-1b of this section:

$$E_m = \sum_{i=1}^{b} \sum_{n=1}^{z} (CO_{2_{n,i}} * P_{n,i}) * \frac{2000}{2205} \qquad \text{(Eq. Z-1b)}$$

Where:

E_m = Annual CO_2 mass emissions from a wet-process phosphoric acid process line m according to this Equation Z-1b (metric tons).

$CO_{2n,i}$ = Carbon dioxide emissions of a grab sample batch of phosphate rock by origin i obtained during month n (percent by weight, expressed as a decimal fraction).

$P_{n,i}$ = Mass of phosphate rock by origin i consumed in month n by wet-process phosphoric acid process line m (tons).

z = Number of months during which the process line m operates.

b = Number of different types of phosphate rock in month, by origin. If the grab sample is a composite sample of rock from more than one origin, b=1.

2000/2205 = Conversion factor to convert tons to metric tons.

42. Section 98.264 is amended by revising paragraphs (a) and (b) to read as follows:

§98.264 Monitoring and QA/QC requirements.

(a) You must obtain a monthly grab sample of phosphate rock directly from the rock being fed to the process line before it enters the mill using one of the following methods. You may conduct the representative bulk sampling using a method published by a consensus standards organization, or you may use industry consensus standard practice methods, including but not limited to the Phosphate Mining States Methods Used and Adopted by the Association of Fertilizer and Phosphate Chemists (AFPC). If phosphate rock is obtained from more than one origin in a month, you must obtain a sample from each origin of rock or obtain a composite representative sample.

(b) You must determine the carbon dioxide or inorganic carbon content of each monthly grab sample of phosphate rock (consumed in the production of phosphoric acid). You may use a method published by a consensus standards organization, or you may use industry consensus standard practice methods, including but not limited to the Phosphate Mining States Methods Used and Adopted by AFPC.

* * * * *

43. Section 98.265 is amended by revising the first and second sentences of paragraph (a) to read as follows:

§98.265 Procedures for estimating missing data.

* * * * *

(a) For each missing value of the inorganic carbon content of phosphate rock or carbon dioxide (by origin), you must use the appropriate default factor provided in Table Z-1 this subpart. Alternatively, you must determine a substitute data value by calculating the arithmetic average of the quality-assured values of inorganic carbon contents of phosphate rock of origin i from samples immediately preceding and immediately following the missing data incident. * * *

* * * * *

44. Section 98.266 is amended by:

a. Revising the introductory text.

b. Revising paragraph (c).

c. Revising paragraph (f) introductory text.

d. Revising paragraph (f)(2).

e. Revising paragraph (f)(4).

f. Revising paragraph (f)(5).

g. Adding paragraph (f)(9).

§98.266 Data reporting requirements.

In addition to the information required by §98.3(c), each annual report must contain the information specified in paragraphs (a) through (f) of this section.

*   *   *   *   *

(c) Annual arithmetic average percent inorganic carbon or carbon dioxide in phosphate rock from monthly records (percent by weight, expressed as a decimal fraction).

*   *   *   *   *

(f) If you do not use a CEMS to measure emissions, then you must report the information in paragraphs (f)(1) through (f)(9) of this section.

*   *   *   *   *

(2) Annual CO_2 emissions from each wet-process phosphoric acid process line (metric tons) as calculated by either Equation Z-1a or Equation Z-1b of this subpart.

*   *   *   *   *

(4) Method used to estimate any missing values of inorganic carbon content or carbon dioxide content of phosphate rock for each wet-process phosphoric acid process line.

(5) Monthly inorganic carbon content of phosphate rock for each wet-process phosphoric acid process line for which Equation Z-1a is used (percent by weight, expressed

as a decimal fraction), or CO_2 (percent by weight, expressed as a decimal fraction) for which Equation Z-1b is used.

*   *   *   *   *

(9) Annual process CO_2 emissions from phosphoric acid production facility (metric tons).

Subpart CC—[Amended]

45. Section 98.294 is amended by revising the third sentence of paragraph (a)(1) to read as follows:

§98.294 Monitoring and QA/QC requirements.

*   *   *   *   *

(a) *   *   *

(1) *   *   * The modified method referred to above adjusts the regular ASTM method to express the results in terms of trona.*   *   *

*   *   *   *   *

46. Section 98.296 is amended by:

a. Revising paragraph (a)(1).

b. Revising paragraph (b)(3).

c. Revising paragraph (b)(6).

d. Revising paragraph (b)(10).

e. Removing paragraph (b)(11)(iv).

f. Removing paragraph (b)(11)(v).

g. Removing paragraph (b)(11)(vi).

§98.296 Data reporting requirements.

* * * * *

(a) * * *

(1) Annual consumption of trona or liquid alkaline feedstock for each manufacturing line (tons).

* * * * *

(b) * * *

(3) Annual production of soda ash for each manufacturing line (tons).

* * * * *

(6) Monthly production of soda ash for each manufacturing line (tons).

* * * * *

(10) If you produce soda ash using the liquid alkaline feedstock process and use the site-specific emission factor method (§98.293(b)(3)) to estimate emissions then you must report the following relevant information for each manufacturing line or stack:

(i) Stack gas volumetric flow rate during performance test (dscfm).

(ii) Hourly CO_2 concentration during performance test (percent CO_2).

(iii) CO_2 emission factor (metric tons CO_2/metric tons of process vent flow from mine water stripper/evaporator).

(iv) CO_2 mass emission rate during performance test (metric tons/hour).

*   *   *   *   *

Subpart EE—[Amended]

47. Section 98.314 is amended by revising paragraph (e) to read as follows:

§98.314 Monitoring and QA/QC requirements.

*   *   *   *   *

(e) You must determine the quantity of carbon-containing waste generated from each titanium dioxide production line on a monthly basis using plant instruments used for accounting purposes including direct measurement weighing the carbon-containing waste not used during the process (by belt scales or a similar device) or through the use of sales records.

*   *   *   *   *

48. Section 98.316 is amended by revising paragraphs (b)(9) and (b)(11) to read as follows:

§98.316 Data reporting requirements.

*   *   *   *   *

(b) *   *   *

(9) Monthly carbon content factor of petroleum coke (percent by weight expressed as a decimal fraction).

*   *   *   *   *

(11) Carbon content for carbon-containing waste for each process line (percent by weight expressed as a decimal fraction).

* * * * *

Subpart GG—[Amended]

49. Section 98.333 is amended by revising the definitions of “$(\mathrm{Electrode})_k$” and “$(C_{\mathrm{Electrode}})_k$” in Equation GG-1 of paragraph (b)(1) to read as follows:

§98.333 Calculating GHG emissions.

* * * * *

(b) * * *

(1) * * * * *

$(\mathrm{Electrode})_k$ = Annual mass of carbon electrode consumed in furnace “k” (tons).

$(C_{\mathrm{Electrode}})_k$ = Carbon content of the carbon electrode consumed in furnace “k”, from the annual carbon analysis (percent by weight, expressed as a decimal fraction).

* * * * *

50. Section 98.336 is amended by revising paragraph (a) introductory text; and by revising paragraphs (b)(1), (b)(7), and (b)(10) to read as follows:

§98.336 Data reporting requirements.

* * * * *

(a) If a CEMS is used to measure CO_2 emissions, then you must report under this subpart the relevant information required for the Tier 4 Calculation Methodology in §98.36 and the information listed in this paragraph (a):

* * * * *

(b) * * *

(1) Identification number and annual process CO_2 emissions from each individual Waelz kiln or electrothermic furnace (metric tons).

* * * * *

(7) Carbon content of each carbon-containing input material charged to each kiln or furnace (including zinc bearing material, flux materials, and other carbonaceous materials) from the annual carbon analysis or from information provided by the material supplier for each kiln or furnace (percent by weight, expressed as a decimal fraction).

* * * * *

(10) Carbon content of the carbon electrode used in each furnace from the annual carbon analysis or from information provided by the material supplier (percent by weight, expressed as a decimal fraction).

* * * * *

Subpart HH—[Amended]

51. Section 98.340 is amended by revising paragraph (b) to read as follows:

§98.340 Definition of the source category.

*   *   *   *   *

(b) This source category does not include Resource Conservation and Recovery Act (RCRA) Subtitle C or Toxic Substances Control Act (TSCA) hazardous waste landfills, construction and demolition waste landfills, or industrial waste landfills.

*   *   *   *   *

52. Section 98.343 is amended by:

a. In paragraph (a)(1), revising Equation HH-1 and the definitions of “x,” “S,” “W_x,” “MCF,” “DOC_F,” “F,” and “k” in Equation HH-1; and removing the definition of “L_0” in Equation HH-1.

b. Revising the last sentence of paragraph (a)(2).

c. Redesignating paragraph (a)(3) as (a)(4) and revising new paragraph (a)(4).

d. Adding a new paragraph (a)(3).

e. Revising paragraph (b)(1), and revising paragraph (b)(2) introductory text.

f. Revising paragraphs (b)(2)(ii), (b)(2)(iii)(A), and (b)(2)(iii)(B).

g. Revising paragraph (c) introductory text.

§98.343 Calculating GHG emissions.

(a) *   *   *

(1) * * * * *

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

* * * * *

x = Year in which waste was disposed.

S = Start year of calculation. Use the year 1960 or the opening year of the landfill, whichever is more recent.

* * * * *

W_x = Quantity of waste disposed in the landfill in year x from measurement data, tipping fee receipts, or other company records (metric tons, as received (wet weight)).

MCF = Methane correction factor (fraction). Use the default value of 1 unless there is active aeration of waste within the landfill during the reporting year. If there is active aeration of waste within the landfill during the reporting year, use either the default value of 1 or select an alternative value no less than 0.5 based on site-specific aeration parameters.

* * * * *

DOC_F = Fraction of DOC dissimilated (fraction). Use the default value of 0.5.

F = Fraction by volume of CH_4 in landfill gas from measurement data on a dry basis, if available (fraction); default is 0.5.

k = Rate constant from Table HH-1 to this subpart (yr^{-1}). Select the most applicable k value for the majority of the past 10 years (or operating life, whichever is shorter).

(2) * * * For years when waste composition data are not available, use the bulk waste parameter values for k and DOC in Table HH-1 to this subpart for the total quantity of waste disposed in those years.

(3) Beginning in the first emissions reporting year and for each year thereafter, if scales are in place, you must determine the annual quantity of waste (in metric tons as received, i.e., wet weight) disposed of in the landfill using paragraph (a)(3)(i) of this section for all containers and for all vehicles used to haul waste to the landfill, except for passenger cars, light duty pickup trucks, or waste loads that cannot be measured using the scales due to physical limitations (load cannot physically access or fit on the scale) and/or operational limitations of the scale (load exceeding the limits or sensitivity range of the scale). If scales are not in place, you must use paragraph (a)(3)(ii) of this section to determine the annual quantity of waste disposed. For waste hauled to the landfill in passenger cars or light duty pickup trucks, you may use either paragraph (a)(3)(i) or paragraph (a)(3)(ii) of this section to determine the annual quantity of waste disposed. For loads that cannot be measured using the scales due to physical and/or operational limitations of the scale, you must use paragraph (a)(3)(ii) of this

section or similar engineering calculations to determine the annual quantity of waste disposed. The approach used to determine the annual quantity of waste disposed of must be documented in the monitoring plan.

(i) Use direct mass measurements of each individual load received at the landfill using either of the following methods:

(A) Weigh using mass scales each vehicle or container used to haul waste as it enters the landfill or disposal area; weigh using mass scales each vehicle or container after it has off-loaded the waste; determine the quantity of waste received from the individual load as the difference in the two mass measurements; and determine the annual quantity of waste received as the sum of all waste loads received during the year. Alternatively, you may determine annual quantity of waste by summing the weights of all vehicles and containers entering the landfill and subtracting from it the sum of all the weights of vehicles and containers after they have off-loaded the waste in the landfill.

(B) Weigh using mass scales each vehicle or container used to haul waste as it enters the landfill or disposal area; determine a representative tare weight by vehicle or container type by weighing no less than 5 of each type of vehicle or container after it has off-loaded the waste; determine the quantity of waste received from the individual load as the difference between the measured weight in and the tare weight determined for that container/vehicle type; and determine the annual quantity of waste received as the sum of all waste loads received during the year.

(ii) Determine the working capacity in units of mass for each type of container or vehicle used to haul waste to the landfill (e.g., using volumetric capacity and waste density measurements; direct measurement of a selected number of passenger vehicles and light duty pick-up trucks; or similar methods); record the number of loads received at the landfill by vehicle/container type; calculate the annual mass per vehicle/container type as the mass product of the number of loads of that vehicle/container multiplied by its working capacity; and calculate the annual quantity of waste received as the sum of the annual mass per vehicle/container type across all of the vehicle/container types used to haul waste to the landfill.

(4) For years prior to the first emissions reporting year, use methods in paragraph (a)(3) of this section when waste disposal quantity data are readily available. When waste disposal quantity data are not readily available, W_x

shall be estimated using one of the applicable methods in paragraphs (a)(4)(i) through (a)(4)(iii) of this section. You must determine which method is most applicable to the conditions and disposal history of your facility. Historical waste disposal quantities should only be determined once, as part of the first annual report, and the same values should be used for all subsequent annual reports, supplemented by the next year’s data on new waste disposal.

(i) Assume all prior years waste disposal quantities are the same as the waste quantity in the first year for which waste quantities are available.

(ii) Use the estimated population served by the landfill in each year, the values for national average per capita waste disposal rates found in Table HH-2 to this subpart, and calculate the waste quantity landfilled using Equation HH-2 of this section.

$$W_x = POP_x \times WDR_x \qquad \text{(Eq. HH-2)}$$

Where:

Wx = Quantity of waste placed in the landfill in year x (metric tons, wet basis).

POPx = Population served by the landfill in year x from city population, census data, or other estimates (capita).

WDRx = Average per capita waste disposal rate for year x from Table HH-2 to this subpart (metric tons per capita per year, wet basis; tons/cap/yr).

(iii) Use a constant average waste disposal quantity calculated using Equation HH-3 of this section for each year the landfill was in operation (i.e., from the first year accepting waste until the last year for which waste disposal data is unavailable, inclusive).

$$W_x = \frac{LFC}{(YrData - YrOpen + 1)} \qquad \text{(Eq. HH-3)}$$

Where:

W_x = Quantity of waste placed in the landfill in year x (metric tons, wet basis).

LFC = Landfill capacity or, for operating landfills, capacity of the landfill used (or the total quantity of waste-in-place) at the end of the year prior to the year when waste disposal data are available from design drawings or engineering estimates (metric tons).

YrData = Year in which the landfill last received waste or, for operating landfills, the year prior to the first reporting year when waste disposal data is first available from company records, or best available data.

YrOpen = Year in which the landfill first received waste from company records or best available data. If no data are available for estimating YrOpen for a closed landfill, use 30 years as the default operating life of the landfill.

(b) * * *

(1) If you continuously monitor the flow rate, CH_4 concentration, temperature, pressure, and, if necessary, moisture content of the landfill gas that is collected and

routed to a destruction device (before any treatment equipment) using a monitoring meter specifically for CH_4 gas, as specified in §98.344, you must use this monitoring system and calculate the quantity of CH_4 recovered for destruction using Equation HH-4 of this section. A fully integrated system that directly reports CH_4 content requires no other calculation than summing the results of all monitoring periods for a given year.

$$R = \sum_{n=1}^{N}\left((V)_n \times (K_{MC})_n \times \frac{(C)_n}{100\%} \times 0.0423 \times \frac{520^\circ R}{(T)_n} \times \frac{(P)_n}{1\ \mathrm{atm}} \times \frac{0.454}{1{,}000}\right) \quad \text{(Eq. HH-4)}$$

Where:

R = Annual quantity of recovered CH_4 (metric tons CH_4).

N = Total number of measurement periods in a year. Use daily averaging periods for a continuous monitoring system and N=365 (or N=366 for leap years). For weekly sampling, as provided in paragraph (b)(2) of this section, use N=52.

n = Index for measurement period.

$(V)_n$ = Cumulative volumetric flow for the measurement period in actual cubic feet (acf). If the flow rate meter automatically corrects for temperature and pressure, replace "$520°R/(T)_n \times (P)_n/1$ atm" with "1".

$(K_{MC})_n$ = Moisture correction term for the measurement period, volumetric basis, as follows: $(K_{MC})_n = 1$ when $(V)_n$ and $(C)_n$ are both measured on a dry basis or if both are measured on a wet basis; $(K_{MC})_n = [1-(f_{H2O})_n]$ when $(V)_n$ is measured on a wet basis and

$(C)_n$ is measured on a dry basis; and $(K_{MC})_n$ = $1/[1-(f_{H2O})_n]$ when $(V)_n$ is measured on a dry basis and $(C)_n$ is measured on a wet basis.

$(f_{H2O})_n$	=	Average moisture content of landfill gas during the measurement period, volumetric basis (cubic feet water per cubic feet landfill gas)
$(C_{CH4})_n$	=	Average CH_4 concentration of landfill gas for the measurement period (volume %).
0.0423	=	Density of CH_4 lb/cfm at 520°R or 60 degrees Fahrenheit and 1 atm.
$(T)_n$	=	Average temperature at which flow is measured for the measurement period (°R).
$(P)_n$	=	Average pressure at which flow is measured for the measurement period (atm).
0.454/1,000	=	Conversion factor (metric ton/lb).

(2) If you do not continuously monitor according to paragraph (b)(1) of this section, you must determine the flow rate, CH_4 concentration, temperature, pressure, and moisture content of the landfill gas that is collected and routed to a destruction device (before any treatment equipment) according to the requirements in paragraphs (b)(2)(i) through (b)(2)(iii) of this section and calculate the quantity of CH_4 recovered for destruction using Equation HH-4 of this section.

*   *   *   *   *

(ii) Determine the CH_4 concentration in the landfill gas that is collected and routed to a destruction device (before any treatment equipment) in a location near or representative of the location of the gas flow meter at least once each calendar week; if only one measurement is made each calendar week, there must be at least three days between measurements.

(iii) * * *

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

(B) If the CH_4 concentration is determined on a dry basis and flow is determined on a wet basis or CH_4 concentration is determined on a wet basis and flow is determined on a dry basis, and the flow meter does not automatically correct for moisture content, determine the moisture content in the landfill gas that is collected and routed to a destruction device (before any treatment equipment) in a location near or representative of the location of the gas flow meter at least once each calendar week; if only one measurement is made each calendar week, there must be at least three days between measurements.

(c) For all landfills, calculate CH_4 generation (adjusted for oxidation in cover materials) and actual CH_4 emissions (taking into account any CH_4 recovery, and oxidation in cover materials) according to the applicable methods in paragraphs (c)(1) through (c)(3) of this section.

* * * * *

53. Section 98.344 is amended by:

a. Revising paragraph (a).

b. Revising the first sentence of paragraph (b) introductory text.

c. Revising paragraphs (b)(6)(ii) introductory text, (b)(6)(ii)(A), and (b)(6)(ii)(B).

d. Revising the definition of "C_{CH4}" in Equation HH-9 of paragraph (b)(6)(iii).

e. Revising the second and third sentences of paragraph (c) introductory text.

f. Revising paragraph (d).

g. Revising the first sentence of paragraph (e).

§98.344 Monitoring and QA/QC requirements.

(a) Mass measurement equipment used to determine the quantity of waste landfilled on or after January 1, 2010 must meet the requirements for weighing equipment as described in "Specifications, Tolerances, and Other

Technical Requirements For Weighing and Measuring Devices” NIST Handbook 44 (2009)(incorporated by reference, see §98.7).

(b) For landfills with gas collection systems, operate, maintain, and calibrate a gas composition monitor capable of measuring the concentration of CH_4 in the recovered landfill gas using one of the methods specified in paragraphs (b)(1) through (b)(6) of this section or as specified by the manufacturer.* * *

* * * * *

(6) * * *

(ii) Determine a non-methane organic carbon correction factor at the routine sampling location no less frequently than once a reporting year following the requirements in paragraphs (b)(6)(ii)(A) through (b)(6)(ii)(C) of this section.

(A) Take a minimum of three grab samples of the landfill gas with a minimum of 20 minutes between samples and determine the methane composition of the landfill gas using one of the methods specified in paragraphs (b)(1) through (b)(5) of this section.

(B) As soon as practical after each grab sample is collected and prior to the collection of a subsequent grab sample, determine the total gaseous organic concentration of the landfill gas using either Method 25A or 25B at 40 CFR part 60, appendix A-7 as specified in paragraph (b)(6)(i) of this section.

*   *   *   *   *

(iii)   *   *   *   *   *

C_{CH4} = Methane concentration in the landfill gas (volume %) for use in Equation HH-4 of this subpart.

*   *   *   *   *

(c) *   *   * Each gas flow meter shall be recalibrated either biennially (every 2 years) or at the minimum frequency specified by the manufacturer. Except as provided in §98.343(b)(2)(i), each gas flow meter must be capable of correcting for the temperature and pressure and, if necessary, moisture content.

*   *   *   *   *

(d) All temperature, pressure, and if necessary, moisture content monitors must be calibrated using the procedures and frequencies specified by the manufacturer.

(e) The owner or operator shall document the procedures used to ensure the accuracy of the estimates of disposal quantities and, if applicable, gas flow rate, gas composition, temperature, pressure, and moisture content measurements. *   *   *

54. Section 98.346 is amended by:

a. Revising paragraph (a).

b. Revising paragraph (b).

c. Revising paragraph (c).

d. Revising paragraph (d)(1).

e. Revising paragraph (f).

f. Revising paragraph (h).

g. Revising paragraph (i)(1)

h. Revising paragraph (i)(2)

i. Revising paragraph (i)(3)

j. Revising paragraph (i)(4)

k. Revising paragraph (i)(5)

l. Revising paragraph (i)(7).

§98.346 Data reporting requirements.

* * * * *

(a) A classification of the landfill as “open” (actively received waste in the reporting year) or “closed” (no longer receiving waste), the year in which the landfill first started accepting waste for disposal, the last year the landfill accepted waste (for open landfills, enter the estimated year of landfill closure), the capacity (in metric tons) of the landfill, an indication of whether leachate recirculation is used during the reporting year and its typical frequency of use over the past 10 years (e.g., used several times a year for the past 10 years, used at least once a year for the past 10 years, used occasionally but not every year over the past 10 years, not used), an indication as to whether scales are present at the landfill, and the waste disposal quantity for each year of landfilling required to be included when using Equation HH-1 of this subpart (in metric tons, wet weight).

(b) Method for estimating reporting year and historical waste disposal quantities, reason for its selection, and the range of years it is applied. For years when waste quantity data are determined using the methods in §98.343(a)(3), report separately the quantity of waste determined using the methods in §98.343(a)(3)(i) and the quantity of waste determined using the methods in §98.343(a)(3)(ii). For historical waste disposal quantities that were not determined using the methods in §98.343(a)(3), provide the population served by the landfill for each year the Equation HH-2 of this subpart is applied, if applicable, or, for open landfills using Equation HH-3 of this subpart, provide the value of landfill capacity (LFC) used in the calculation.

(c) Waste composition for each year required for Equation HH-1 of this subpart, in percentage by weight, for each waste category listed in Table HH-1 to this subpart that is used in Equation HH-1 of this subpart to calculate the annual modeled CH_4 generation.

(d) * * *

(1) Degradable organic carbon (DOC), methane correction factor (MCF), and fraction of DOC dissimilated (DOC_F) values used in the calculations. If an MCF value other than the default of 1 is used, provide an indication of whether active aeration of the waste in the landfill was conducted during the reporting year, a description of the aeration system, including aeration blower capacity, the fraction of the landfill containing waste affected by the aeration, the total number of hours during the year the aeration blower was operated, and other factors used as a basis for the selected MCF value.

* * * * *

(f) The surface area of the landfill containing waste (in square meters), identification of the type of cover material used (as either organic cover, clay cover, sand cover, or other soil mixtures). If multiple cover types are used, the surface area associated with each cover type.

* * * * *

(h) For landfills without gas collection systems, the annual methane emissions (i.e., the methane generation, adjusted for oxidation, calculated using Equation HH-5 of this subpart), reported in metric tons CH_4, and an indication of whether passive vents and/or passive flares (vents or flares that are not considered part of the gas collection system as defined in §98.6) are present at this landfill.

(i) * * *

(1) Total volumetric flow of landfill gas collected for destruction for the reporting year (cubic feet at 520°R or 60 degrees Fahrenheit and 1 atm).

(2) Annual average CH_4 concentration of landfill gas collected for destruction (percent by volume).

(3) Monthly average temperature and pressure for each month at which flow is measured for landfill gas collected for destruction, or statement that temperature and/or pressure is incorporated into internal calculations run by the monitoring equipment.

(4) An indication as to whether flow was measured on a wet or dry basis, an indication as to whether CH_4 concentration was measured on a wet or dry basis, and if required for Equation HH-4 of this subpart, monthly average moisture content for each month at which flow is measured for landfill gas collected for destruction.

(5) An indication of whether destruction occurs at the landfill facility or off-site. If destruction occurs

at the landfill facility, also report an indication of whether a back-up destruction device is present at the landfill, the annual operating hours for the primary destruction device, the annual operating hours for the back-up destruction device (if present), and the destruction efficiency used (percent).

*   *   *   *   *

(7) A description of the gas collection system (manufacturer, capacity, and number of wells), the surface area (square meters) and estimated waste depth (meters) for each area specified in Table HH-3 to this subpart, the estimated gas collection system efficiency for landfills with this gas collection system, the annual operating hours of the gas collection system, and an indication of whether passive vents and/or passive flares (vents or flares that are not considered part of the gas collection system as defined in §98.6) are present at the landfill.

*   *   *   *   *

55. Section 98.347 is amended by adding a second sentence to the introductory text to read as follows:

§98.347 Records that must be retained.

*   *   * You must retain records of all measurements made to determine tare weights and working

capacities by vehicle/container type if these are used to determine the annual waste quantities.

56. Section 98.348 is revised to read as follows:

§98.348 Definitions.

Except as specified in this section, all terms used in this subpart have the same meaning given in the Clean Air Act and subpart A of this part.

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

Destruction device means a flare, thermal oxidizer, boiler, turbine, internal combustion engine, or any other combustion unit used to destroy or oxidize methane contained in landfill gas.

Industrial waste landfill means any landfill other than a municipal solid waste landfill, a RCRA Subtitle C hazardous waste landfill, or a TSCA hazardous waste landfill, in which industrial solid waste, such a RCRA Subtitle D wastes (nonhazardous industrial solid waste, defined in §257.2 of this chapter), commercial solid wastes, or conditionally exempt small quantity generator wastes, is placed. An industrial waste landfill includes all disposal areas at the facility.

Solid waste has the meaning established by the Administrator pursuant to the Solid Waste Disposal Act (42 U.S.C.A. 6901 et seq.)

Working capacity means the maximum volume or mass of waste that is actually placed in the landfill from an individual or representative type of container (such as a tank, truck, or roll-off bin) used to convey wastes to the landfill, taking into account that the container may not be able to be 100 percent filled and/or 100 percent emptied for each load.

57. Table HH-1 to subpart HH is revised to read as follows:

Table HH-1 to Subpart HH—Emissions Factors, Oxidation Factors and Methods

Factor	Default value	Units
DOC and k values—Bulk waste option		

Factor	Default value	Units
DOC (bulk waste)	0.20	Weight fraction, wet basis
k (precipitation plus recirculated leachate[a] <20 inches/year)	0.02	yr^{-1}
k (precipitation plus recirculated leachate[a] 20-40 inches/year)	0.038	yr^{-1}
k (precipitation plus recirculated leachate[a] >40 inches/year)	0.057	yr^{-1}
DOC and k values—Modified bulk MSW option		
DOC (bulk MSW, excluding inerts and C&D waste)	0.31	Weight fraction, wet basis
DOC (inerts, e.g., glass, plastics, metal, concrete)	0.00	Weight fraction, wet basis
DOC (C&D waste)	0.08	Weight fraction, wet basis
k (bulk MSW, excluding inerts and C&D waste)	0.02 to 0.057[b]	yr^{-1}
k (inerts, e.g., glass, plastics, metal, concrete)	0.00	yr^{-1}
k (C&D waste)	0.02 to 0.04[b]	yr^{-1}
DOC and k values—Waste composition option		
DOC (food waste)	0.15	Weight fraction, wet basis
DOC (garden)	0.2	Weight fraction, wet basis
DOC (paper)	0.4	Weight fraction, wet basis
DOC (wood and straw)	0.43	Weight fraction, wet basis
DOC (textiles)	0.24	Weight fraction, wet basis
DOC (diapers)	0.24	Weight fraction, wet basis
DOC (sewage sludge)	0.05	Weight fraction, wet basis
DOC (inerts, e.g., glass, plastics, metal, cement)	0.00	Weight fraction, wet basis
k (food waste)	0.06 to 0.185[c]	yr^{-1}

Factor	**Default value**	**Units**
k (garden)	0.05 to 0.10[c]	yr^{-1}
k (paper)	0.04 to 0.06[c]	yr^{-1}
k (wood and straw)	0.02 to 0.03[c]	yr^{-1}
k (textiles)	0.04 to 0.06[c]	yr^{-1}
k (diapers)	0.05 to 0.10[c]	yr^{-1}
k (sewage sludge)	0.06 to 0.185[c]	yr^{-1}
k (inerts e.g. glass, plastics, metal, concrete)	0.00	yr^{-1}
Other parameters—All MSW landfills		
MCF	1	
DOC_F	0.5	
F	0.5	
OX	0.1	
DE	0.99	

[a] Recirculated leachate (in inches/year) is the total volume of leachate recirculated from company records or engineering estimates divided by the area of the portion of the landfill containing waste with appropriate unit conversions. Alternatively, landfills that use leachate recirculation can elect to use the k value of 0.057 rather than calculating the recirculated leachate rate.

[b] Use the lesser value when precipitation plus recirculated leachate is less than 20 inches/year. Use the greater value when precipitation plus recirculated leachate is greater than 40 inches/year. Use the average of the range of values when precipitation plus recirculated leachate is 20 to 40 inches/year (inclusive). Alternatively, landfills that use leachate recirculation can elect to use the greater value rather than calculating the recirculated leachate rate.

[c] Use the lesser value when the potential evapotranspiration rate exceeds the mean annual precipitation rate plus recirculated leachate. Use the greater value when the potential evapotranspiration rate does not exceed the mean annual precipitation rate plus recirculated leachate. Alternatively, landfills that use leachate recirculation can elect to use the greater value rather than assessing the potential evapotranspiration rate or recirculated leachate rate.

58. Table HH-2 to subpart HH is amended by:

a. Removing the third column “% to SWDS.”

b. Removing the entries for “1950” through “1959.”

c. Revising the entries for “1989” through “2006.”

d. Adding entries for “2007” through “2009.”

Table HH-2 to Subpart HH—U.S. Per Capita Waste Disposal Rates

Year	**Waste per capita** ton/cap/yr
* * * * * * *	
1989	0.83
1990	0.82
1991	0.76
1992	0.74
1993	0.76
1994	0.75
1995	0.70
1996	0.68
1997	0.69
1998	0.75
1999	0.75
2000	0.80
2001	0.91
2002	1.02
2003	1.02
2004	1.01
2005	0.98
2006	0.95
2007	0.95
2008	0.95
2009	0.95

59. Table HH-3 to subpart HH-3 is amended by revising the entries for “A2: Area without active gas collection, regardless of cover type H2: Average depth of waste in area A2,” “A3: Area with daily soil cover and active gas collection H3: Average depth of waste in area A3,” “A4: Area with an intermediate soil cover and active gas collection H4: Average depth of waste in area A4,” and “A5: Area with a final soil and geomembrane cover system

and active gas collection H5: Average depth of waste in area A5” to read as follows:

Table HH-3 to Subpart HH—Landfill Gas Collection Efficiencies

Description	Landfill Gas Collection Efficiency
* * * * * * *	
A2: Area without active gas collection, regardless of cover type	CE2: 0%.
A3: Area with daily soil cover and active gas collection	CE3: 60%.
A4: Area with an intermediate soil cover, or a final soil cover not meeting the criteria for A5 below, and active gas collection	CE4: 75%.
A5: Area with a final soil cover of 3 feet or thicker of clay and/or geomembrane cover system and active gas collection	CE5: 95%.
* * * * * * *	

Subpart LL—[Amended]

60. Section 98.386 is amended by:

a. Revising paragraph (a)(3).

b. Adding a third sentence to the end of paragraph (a)(5).

c. Adding a third sentence to the end of paragraph (a)(6).

d. Revising paragraph (a)(7).

e. Revising paragraphs (a)(16) and (a)(17).

f. Revising paragraphs (b)(3) and (c)(3).

g. Adding paragraph (d).

§98.386 Data reporting requirements.

*   *   *   *   *

(a) * * *

(3) For each feedstock reported in paragraph (a)(2) of this section that was produced by blending a fossil fuel-based product with a biomass-based product, report the percent of the volume reported in paragraph (a)(2) of this section that is fossil fuel-based (excluding any denaturant that may be present in any ethanol product).

*   *   *   *   *

(5) * * * Those products that enter the facility, but are not reported in (a)(1), shall not be reported under this paragraph.

(6) * * * Those products that enter the facility, but are not reported in (a)(2), shall not be reported under this paragraph.

(7) For each product reported in paragraph (a)(6) of this section that was produced by blending a fossil fuel-based product with a biomass-based product, report the percent of the volume reported in paragraph (a)(6) of this section that is fossil fuel-based (excluding any denaturant that may be present in any ethanol product).

*   *   *   *   *

(16) The CO_2 emissions in metric tons that would result from the complete combustion or oxidation of each feedstock reported in paragraph (a)(2) of this section that were calculated according to §98.393(b) or (h).

(17) The CO_2 emissions in metric tons that would result from the complete combustion or oxidation of each product (leaving the coal-to-liquid facility) reported in paragraph (a)(6) of this section that were calculated according to §98.393(a) or (h).

* * * * *

(b) * * *

(3) For each product reported in paragraph (b)(2) of this section that was produced by blending a fossil fuel-based product with a biomass-based product, report the percent of the volume reported in paragraph (b)(2) of this section that is fossil fuel-based (excluding any denaturant that may be present in any ethanol product).

* * * * *

(c) * * *

(3) For each product reported in paragraph (c)(2) of this section that was produced by blending a fossil fuel-based product with a biomass-based product, report the percent of the volume reported in paragraph (c)(2) of this

section that is fossil fuel-based (excluding any denaturant that may be present in any ethanol product).

* * * * *

(d) Blended feedstock and products.

(1) Producers, exporters, and importers must report the following information for each blended product and feedstock where emissions were calculated according to §98.393(i):

(i) Volume or mass of each blending component.

(ii) The CO_2 emissions in metric tons that would result from the complete combustion or oxidation of each blended feedstock or product, using Equation MM-12 or Equation MM-13 of §98.393.

(iii) Whether it is a blended feedstock or a blended product.

(2) For a product that enters the facility to be further refined or otherwise used on site that is a blended feedstock, producers must meet the reporting requirements of paragraphs (a)(1) and (a)(2) of this section by reflecting the individual components of the blended feedstock.

(3) For a product that is produced, imported, or exported that is a blended product, producers, importers, and exporters must meet the reporting requirements of

paragraphs (a)(5), (a)(6), (b)(1), (b)(2), (c)(1), and (c)(2) of this section, as applicable, by reflecting the individual components of the blended product.

Subpart MM—[Amended]

61. Section 98.393 is amended by:

a. In paragraph (a)(1), revising the only sentence and the definition of "Product_i" in Equation MM-1.

b. Revising the definition of "Product_i" in Equation MM-2 of paragraph (a)(2).

c. Revising the only sentence of paragraph (b)(1) and the first sentence in paragraph (f)(1).

d. Revising the definition of “$\%\text{Vol}_i$” in Equation MM-8 in paragraph (h)(1).

e. Revising Equation MM-9 and the definition of “$\%\text{Vol}_j$” in paragraph (h)(2).

f. Revising paragraphs (h)(3) and (h)(4).

g. Adding paragraph (i).

§98.393 Calculating GHG emissions.

(a) * * *

(1) Except as provided in paragraphs (h) and (i) of this section, any refiner, importer, or exporter shall calculate CO_2 emissions from each individual petroleum product and natural gas liquid using Equation MM-1 of this section.

*   *   *   *   *

Product$_i$ = Annual volume of product “i” produced, imported, or exported by the reporting party (barrels). For refiners, this volume only includes products ex refinery gate, and excludes products that entered the refinery but are not reported under §98.396(a)(1). For natural gas liquids, volumes shall reflect the individual components of the product as listed in Table MM-1 to subpart MM.

*   *   *   *   *

(2) *   *   *   *   *

Product$_i$ = Annual mass of product “i” produced, imported, or exported by the reporting party (metric tons). For refiners, this mass only includes products ex refinery gate, and excludes products that entered the refinery but are not reported under §98.396(a)(1).

*   *   *   *   *

(b) *   *   *

(1) Except as provided in paragraphs (h) and (i) of this section, any refiner shall calculate CO_2 emissions from each non-crude feedstock using Equation MM-2 of this section.

*   *   *   *   *

(f) *   *   *

(1) Calculation Method 1. To determine the emission factor (i.e., EF_i in Equation MM-1) for solid products, multiply the default carbon share factor (i.e., percent

carbon by mass) in column B of Table MM–1 to this subpart for the appropriate product by 44/12. * * *

* * * * *

(h) * * *

(1) * * *

$\%Vol_i$ = Percent volume of product “i” that is petroleum-based, not including any denaturant that may be present in any ethanol product, expressed as a fraction (e.g., 75% would be expressed as 0.75 in the above equation).

(2) * * * * *

$$CO_{2j} = Feedstock_j * EF_j * \%Vol_j \quad \text{(Eq. MM-9)}$$

* * * * *

$\%Vol_j$ = Percent volume of feedstock “j” that is petroleum-based, not including any denaturant that may be present in any ethanol product, expressed as a fraction (e.g., 75% would be expressed as 0.75 in the above equation).

(3) Calculation Method 2 procedures for products.

(i) A reporter using Calculation Method 2 of this subpart to determine the emission factor of a petroleum product that does not contain denatured ethanol must calculate the CO_2 emissions associated with that product using Equation MM-10 of this section in place of Equation MM-1 of this section.

$$CO_{2i} = (Product_i * EF_i) - (Product_i * EF_m * \%Vol_m) \quad \text{(Eq. MM-10)}$$

Where:

CO_{2i} = Annual CO_2 emissions that would result from the complete combustion or oxidation of each product “i” (metric tons).

$Product_i$ = Annual volume of each petroleum product “i” produced, imported, or exported by the reporting party (barrels). For refiners, this volume only includes products ex refinery gate.

EF_i = Product-specific CO_2 emission factor (metric tons CO_2 per barrel).

EF_m = Default CO_2 emission factor from Table MM-2 to subpart MM that most closely represents the component of product “i” that is biomass-based.

$\%Vol_m$ = Percent volume of petroleum product “i” that is biomass-based, expressed as a fraction (e.g., 75% would be expressed as 0.75 in the above equation).

(ii) In the event that a petroleum product contains denatured ethanol, importers and exporters must follow Calculation Method 1 procedures in paragraph (h)(1) of this section; and refineries must sample the petroleum portion of the blended biomass-based fuel prior to blending and calculate CO_2 emissions using Equation MM-10a of this section.

$$CO_{2i} = Product_p * EF_i \qquad \text{(Eq. MM-10a)}$$

Where:

CO_{2i} = Annual CO_2 emissions that would result from the complete combustion or oxidation of each biomass-blended fuel “i” (metric tons).

$Product_p$ = Annual volume of the petroleum-based portion of each biomass blended fuel “i” produced by the refiner (barrels).

EF_i = Petroleum product-specific CO_2 emission factor (metric tons CO_2 per barrel).

(4) Calculation Method 2 procedures for non-crude feedstocks.

(i) A refiner using Calculation Method 2 of this subpart to determine the emission factor of a non-crude petroleum feedstock that does not contain denatured ethanol must calculate the CO_2 emissions associated with that feedstock using Equation MM-11 of this section in place of Equation MM-2 of this section.

$$CO_{2j} = (Feedstock_j * EF_j)-(Feedstock_j * EF_m * \%Vol_m) \quad \text{(Eq. MM-11)}$$

Where:

CO_{2j} = Annual CO_2 emissions that would result from the complete combustion or oxidation of each non-crude feedstock “j” (metric tons).

$Feedstock_j$ = Annual volume of each petroleum product “j” that enters the refinery to be further refined or otherwise used on site (barrels).

EF_j = Feedstock-specific CO_2 emission factor (metric tons CO_2 per barrel).

EF_m = Default CO_2 emission factor from Table MM-2 to subpart MM that most closely represents the component of petroleum product “j” that is biomass-based.

$\%Vol_m$ = Percent volume of non-crude feedstock “j” that is biomass-based, expressed as a fraction (e.g., 75% would be expressed as 0.75 in the above equation).

(ii) In the event that a non-crude feedstock contains denatured ethanol, refiners must follow Calculation Method 1 procedures in paragraph (h)(2) of this section.

(i) Optional procedures for blended products that do not contain biomass.

(1) In the event that a reporter produces, imports, or exports a blended product that does not include biomass, the reporter may calculate emissions for the blended product according to the method in paragraph (i)(2) of this section. In the event that a refiner receives a blended non-crude feedstock that does not include biomass, the refiner may calculate emission for the blended non-crude feedstock according to the method in paragraph (i)(3) of this section. The procedures in this section may be used only if all of the following criteria are met:

(i) The reporter knows the relative proportion of each component of the blend (i.e., the mass or volume percentage).

(ii) Each component of blended product “i” or blended non-crude feedstock “j” meets the strict definition of a product listed in Table MM-1 to subpart MM.

(iii) The blended product or non-crude feedstock is not comprised entirely of natural gas liquids.

(iv) The reporter uses Calculation Method 1.

(v) Solid components are blended only with other solid components.

(2) The reporter must calculate emissions for the blended product using Equation MM-12 of this section in place of Equation MM-1 of this section.

$$CO_{2i} = \sum [Blending\ Component_{i...n} * EF_{i...n}] \qquad \text{(Eq. MM-12)}$$

Where:

CO_{2i} = Annual CO_2 emissions that would result from the complete combustion or oxidation of a blended product ″i" (metric tons).

Blending $Component_{i…n}$ = Annual volume or mass of each blending component that is blended (barrels or metric tons).

$EF_{i…n}$ = CO_2 emission factors specific to each blending component (metric tons CO_2 per barrel or per metric ton of product).

n = Number of blending components blended into blended product ″i″.

(3) For refineries, the reporter must calculate emissions for the blended non-crude feedstock using Equation MM-13 of this section in place of Equation MM-2 of this section.

$$CO_{2i} = \sum [Blending\ Component_{i...n} * EF_{i...n}] \qquad \text{(Eq. MM-13)}$$

Where:

CO_{2j} = Annual CO_2 emissions that would result from the complete combustion or oxidation of a blended non-crude feedstock ″j″ (metric tons).

$\text{Blending Component}_{i\ldots n}$ = Annual volume or mass of each blending component that is blended (barrels or metric tons).

$EF_{i\ldots n}$ = CO_2 emission factors specific to each blending component (metric tons CO_2 per barrel or per metric ton of product).

n = Number of blending components blended into blended non-crude feedstock “j”.

(4) For refineries, if a blending component “k” used in paragraph (i)(2) of this section enters the refinery before blending as non-crude feedstock:

(i) The emissions that would result from the complete combustion or oxidation of non-crude feedstock “k” must still be calculated separately using Equation MM-2 of this section and applied in Equation MM-4 of this section.

(ii) The quantity of blending component “k” applied in Equation MM-12 of this section and the quantity of non-crude feedstock “k” applied in Equation MM-2 of this section must be determined using the same method or practice.

62. Section 98.394 is amended by:

a. Revising paragraph (a)(1).

b. Adding paragraph (a)(3).

c. Revising paragraph (d)(1).

d. Revising paragraph (d)(2).

e. Revising paragraph (d)(3).

f. Revising paragraph (d)(4).

§98.394 Monitoring and QA/QC requirements.

(a) * * *

(1) The quantity of petroleum products, natural gas liquids, and biomass, as well as the quantity of crude oil measured on site at a refinery, shall be determined as follows:

* * * * *

(3) The quantity of crude oil not measured on site at a refinery shall be determined using an appropriate method published by a consensus-based standards organization or industry standard practice.

* * * * *

(d) * * *

(1) A representative sample or multiple representative samples of each batch of crude oil shall be taken according to an appropriate standard method published by a consensus-based standards organization or industry standard practice.

(2) Samples shall be handled according to an appropriate standard method published by a consensus-based standards organization or according to an industry standard practice.

(3) API gravity shall be measured using an appropriate standard method published by a consensus-based standards organization or industry standard practice. The weighted average API gravity for each batch shall be calculated by multiplying the volume associated with each representative sample by the API gravity, adding these values for all the samples, and then dividing that total value by the volume of the batch.

(4) Sulfur content shall be measured using an appropriate standard method published by a consensus-based standards organization or industry standard practice. The weighted average sulfur content for each batch shall be calculated by multiplying the volume associated with each representative sample by the sulfur content, adding these values for all the samples, and then dividing that total value by the volume of the batch.

* * * * *

63. Section 98.396 is amended by:

a. Revising paragraph (a)(3).

b. Amending paragraphs (a)(5) and (a)(6) by adding a third sentence.

c. Revising paragraphs (a)(7), (a)(16), and (a)(17), (a)(20)(ii), (a)(20)(iii), and (a)(20)(iv).

d. Adding paragraphs (a)(20)(v), (a)(20)(vi), (a)(22), and (a)(23).

e. Revising paragraphs (b)(3) and (c)(3).

f. Adding paragraph (d).

§98.396 Data reporting requirements.

* * * * *

(a) * * *

(3) For each feedstock reported in paragraph (a)(2) of this section that was produced by blending a petroleum-based product with a biomass-based product, report the percent of the volume reported in paragraph (a)(2) of this section that is petroleum-based (excluding any denaturant that may be present in any ethanol product).

* * * * *

(5) * * * Petroleum products and natural gas liquids that enter the refinery, but are not reported in (a)(1), shall not be reported under this paragraph.

(6) * * * Petroleum products and natural gas liquids that enter the refinery, but are not reported in (a)(2), shall not be reported under this paragraph.

(7) For each product reported in paragraph (a)(6) of this section that was produced by blending a petroleum-based product with a biomass-based product, report the percent of the volume reported in paragraph (a)(6) of this

section that is petroleum-based (excluding any denaturant that may be present in any ethanol product).

* * * * *

(16) The CO_2 emissions in metric tons that would result from the complete combustion or oxidation of each petroleum product and natural gas liquid (ex refinery gate) reported in paragraph (a)(6) of this section that were calculated according to §98.393(a) or (h).

(17) The CO_2 emissions in metric tons that would result from the complete combustion or oxidation of each feedstock reported in paragraph (a)(2) of this section that were calculated according to §98.393(b) or (h).

* * * * *

(20) * * *

(ii) Weighted average API gravity representing the batch at the point of entry at the refinery.

(iii) Weighted average sulfur content representing the batch at the point of entry at the refinery.

(iv) Country of origin, of the batch, if known and data in paragraphs (a)(20)(v) and (a)(20)(vi) of this section are unknown.

(v) EIA crude stream code and crude stream name of the batch, if known.

(vi) Generic name for the crude stream and the appropriate EIA two-letter country or state and production area code of the batch, if known and no appropriate EIA crude stream code exists.

*   *   *   *   *

(22) Volume of crude oil in barrels that you injected into a crude oil supply or reservoir. A volume of crude oil that entered the refinery, but was not reported in paragraphs (a)(2) or (a)(20), shall not be reported under this paragraph.

(23) Special provisions for 2010. For reporting year 2010 only, a refiner that knows the information under a specific tier of the batch definition in 40 CFR 98.398, but does not have the necessary data collection and management in place to readily report this information, can use the next most appropriate tier of the batch definition for reporting batch information under paragraph 98.396(a)(20).

(b) *   *   *

(3) For each product reported in paragraph (b)(2) of this section that was produced by blending a petroleum-based product with a biomass-based product, report the percent of the volume reported in paragraph (b)(2) of this section that is petroleum-based (excluding any denaturant that may be present in any ethanol product).

* * * * *

(c) * * *

(3) For each product reported in paragraph (c)(2) of this section that was produced by blending a petroleum-based product with a biomass-based product, report the percent of the volume reported in paragraph (c)(2) of this section that is petroleum based (excluding any denaturant that may be present in any ethanol product).

* * * * *

(d) Blended non-crude feedstock and products.

(1) Refineries, exporters, and importers must report the following information for each blended product and non-crude feedstock where emissions were calculated according to §98.393(i):

(i) Volume or mass of each blending component.

(ii) The CO_2 emissions in metric tons that would result from the complete combustion or oxidation of each blended non-crude feedstock or product, using Equation MM-12 or Equation MM-13 of this section.

(iii) Whether it is a blended non-crude feedstock or a blended product.

(2) For a product that enters the refinery to be further refined or otherwise used on site that is a blended non-crude feedstock, refiners must meet the reporting

requirements of paragraphs (a)(1) and (a)(2) of this section by reflecting the individual components of the blended non-crude feedstock.

(3) For a product that is produced, imported, or exported that is a blended product, refiners, importers, and exporters must meet the reporting requirements of paragraphs (a)(5), (a)(6), (b)(1), (b)(2), (c)(1), and (c)(2) of this section, as applicable, by reflecting the individual components of the blended product.

64. Section 98.397 is amended by:

a. Revising the second sentence of paragraph (b).

b. Removing paragraph (e).

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

§98.397 Records that must be retained.

* * * * *

(b) * * * For all reported quantities of petroleum products, natural gas liquids, and biomass, as well as crude oil quantities measured on site at a refinery, reporters shall maintain metering, gauging, and other records normally maintained in the course of business to document product and feedstock flows including the date of initial calibration and the frequency of recalibration for the measurement equipment used.

65. Section 98.398 is revised to read as follows:

§98.398 Definitions.

Except as specified in this section, all terms used in this subpart have the same meaning given in the Clean Air Act and subpart A of this part.

Batch means either a volume of crude oil that enters a refinery or the components of such volume (e.g., the volumes of different crude streams that are blended together and then delivered to a refinery)._ The batch volume is the first appropriate tier in the following list:

(1) Up to an annual volume of a type of crude oil identified by an EIA crude stream code, if the EIA crude stream code is known.

(2) Up to an annual volume of a type of crude oil identified by a generic name for the crude stream and an appropriate EIA two-letter country or state and production area code, if the generic name and EIA two-letter code are known but no appropriate EIA crude stream code exists.

(3) Up to a calendar month of crude oil volume from a single known foreign country of origin if the crude stream name is unknown.

(4) Up to a calendar month of crude oil volume from the United States if the crude stream name and production area are unknown.

(5) Up to a calendar month of crude oil volume if the country of origin is unknown.

Subpart NN—[Amended]

66. Section 98.403 is amended by:

a. Revising the definitions of "$Fuel_h$" and “HHV_h” in Equation NN-1 of paragraph (a)(1).

b. Revising the definition of "$Fuel_h$" in Equation NN-2 of paragraph (a)(2).

c. Revising the definition of “$Fuel_1$” in Equation NN-5 of paragraph (b)(3).

d. Revising the definition of "EF_g" in Equation NN-7 of paragraph (c)(1).

e. In paragraph (c)(2), revising Equation NN-8 and the definition of “CO_{2i}” in Equation NN-8.

§98.403 Calculating GHG emissions.

(a) * * *

(1) * * * * *

$Fuel_h$ = Total annual volume of product “h” supplied (volume per year, in thousand standard cubic feet (Mscf) for natural gas and bbl for NGLs).

HHV_h = Higher heating value of product “h” supplied (MMBtu/ Mscf or MMBtu/bbl).

* * * * *

(2) * * * * *

$Fuel_h$ = Total annual volume of product “h” supplied (bbl or Mscf per year)

* * * * *

(b) * * *

(3) * * * * *

$Fuel_1$ = Total annual volume of natural gas received by the LDC at the city gate and stored on-system or liquefied and stored in the reporting year (Mscf per year).

* * * * *

(c) * * *

(1) * * * * *

EF_g = Fuel-specific CO_2 emission factor of NGL product “g” (MT CO_2/bbl).

(2) * * * * *

$$CO_2 = CO_{2i} - CO_{2m} \quad \text{(Eq. NN-8)}$$

* * * * *

CO_{2i} = Annual CO_2 mass emissions that would result from the combustion or oxidation of fractionated NGLs delivered to all customers or on behalf of customers as calculated in paragraph (a)(1) or (a)(2) of this section (metric tons).

* * * * *

67. Section 98.406 is amended by revising paragraphs (a)(6) and (a)(9) introductory text to read as follows:

§98.406 Data reporting requirements.

(a) * * *

(6) Annual CO_2 emissions (metric tons) that would result from the complete combustion or oxidation of the

quantities in paragraphs (a)(1) and (a)(2) of this section, calculated in accordance with §98.403(a) and (c)(1).

* * * * *

(9) If the NGL fractionator developed reporter-specific EFs or HHVs, report the following for each product type:

* * * * *

68. Section 98.407 is amended by revising paragraphs (a) and (d) to read as follows:

§98.407 Records that must be retained.

* * * * *

(a) Records of all meter readings and documentation to support volumes of natural gas and NGLs that are reported under this part.

* * * * *

(d) Records related to the large end-users identified in §98.406(b)(7).

* * * * *

69. Tables NN-1 and NN-2 to Subpart NN are amended to read as follows:

Table NN-1 to Subpart NN—Default Factors for Calculation Methodology 1 of this Subpart

Fuel	**Default High Heating Value Factor**	**Default CO_2 Emission Factor (kg CO_2 /MMBtu)**
Natural Gas	1.028 MMBtu/Mscf	53.02
Propane	3.822 MMBtu/bbl	61.46
Normal butane	4.242 MMBtu/bbl	65.15

Fuel	Default High Heating Value Factor	Default CO_2 Emission Factor (kg CO_2 /MMBtu)
Ethane	4.032 MMBtu/bbl	62.64
Isobutane	4.074 MMBtu/bbl	64.91
Pentanes plus	4.620 MMBtu/bbl	70.02

Table NN-2 to Subpart NN—Lookup Default Values for Calculation Methodology 2 of this Subpart

Fuel	Unit	Default CO_2 Emission Value (MT CO_2/Unit)
Natural Gas	Mscf	0.055
Propane	Barrel	0.235
Normal butane	Barrel	0.276
Ethane	Barrel	0.253
Isobutane	Barrel	0.266
Pentanes plus	Barrel	0.324