

20.2.300 NMAC incorporates Subparts from 40 CFR 98 as published in the Federal Register through 10/28/2010. Following is from 74 FR 56260 (10/30/2009), which was not amended as of 10/28/2010.

Subpart X—Petrochemical Production

§ 98.240 Definition of the source category.

(a) The petrochemical production source category consists of all processes that produce acrylonitrile, carbon black, ethylene, ethylene dichloride, ethylene oxide, or methanol, except as specified in paragraphs (b) through (f) of this section. The source category includes processes that produce the petrochemical as an intermediate in the onsite production of other chemicals as well as processes that produce the petrochemical as an end product for sale or shipment offsite.

(b) A process that produces a petrochemical as a byproduct is not part of the petrochemical production source category.

(c) A facility that makes methanol, hydrogen, and/or ammonia from synthesis gas is part of the petrochemical source category if the annual mass of methanol produced exceeds the individual annual mass production levels of both hydrogen recovered as product and ammonia. The facility is part of subpart P of this part (Hydrogen Production) if the annual mass of hydrogen recovered as product exceeds the individual annual mass production levels of both methanol and ammonia. The facility is part of subpart G of this part (Ammonia Manufacturing) if the annual mass of ammonia produced exceeds the individual annual mass production levels of both hydrogen recovered as product and methanol.

(d) A direct chlorination process that is operated independently of an oxychlorination process to produce ethylene dichloride is not part of the petrochemical production source category.

(e) A process that produces bone black is not part of the petrochemical source category.

(f) A process that produces a petrochemical from bio-based feedstock is not part of the petrochemical production source category.

§ 98.241 Reporting threshold.

You must report GHG emissions under this subpart if your facility contains a petrochemical process as specified in § 98.240, and the facility meets the requirements of either § 98.2(a)(1) or (2).

§ 98.242 GHGs to report.

You must report the information in paragraphs (a) through (c) of this section:

(a) CO₂, CH₄, and N₂O process emissions from each petrochemical process unit.

Process emissions include CO₂ generated by reaction in the process and by combustion of process off-gas in stationary combustion units and flares.

(1) If you comply with § 98.243(b) or (d), report under this subpart the calculated CO₂, CH₄, and N₂O emissions for each stationary combustion source and flare that burns any amount of petrochemical process off-gas.

(2) If you comply with § 98.243(c), report under this subpart the calculated CO₂ emissions for each petrochemical process unit.

(b) CO₂, CH₄, and N₂O combustion emissions from stationary combustion units and flares.

(1) If you comply with § 98.243(b) or (d), report these emissions from stationary combustion units that are associated with petrochemical process units and burn only supplemental fuel under subpart C of this part (General Stationary Fuel Combustion Sources) by following the requirements of subpart C.

(2) If you comply with § 98.243(c), report CO₂, CH₄, and N₂O combustion emissions under subpart C of this part (General Stationary Fuel Combustion Sources) by following the requirements of subpart C only for the combustion of supplemental fuel. Determine the applicable Tier in subpart C of this part (General Stationary Fuel Combustion Sources) based on the maximum rated heat input capacity of the stationary combustion source.

(c) CO₂ captured. You must report the mass of CO₂ captured under, subpart PP of this part (Suppliers of Carbon Dioxide (CO₂)) by following the requirements of subpart PP.

§ 98.243 Calculating GHG emissions.

(a) If you route all process vent emissions and emissions from combustion of process off-gas to one or more stacks and use CEMS on each stack to measure CO₂ emissions (except flare stacks), then you must determine process-based GHG emissions in accordance with paragraph (b) of this section. Otherwise, determine process-based GHG emissions in accordance with the procedures specified in paragraph (c) or (d) of this section.

(b) Continuous emission monitoring system (CEMS). Route all process vent emissions and emissions from combustion of process off-gas to one or more stacks and determine CO₂ emissions from each stack (except flare stacks) according to the Tier 4 Calculation Methodology requirements in subpart C of this part. For each stack (except flare stacks) that includes emissions from combustion of petrochemical process off-gas, calculate CH₄ and N₂O emissions in accordance with subpart C of this part (use the Tier 3 methodology and emission factors for “Petroleum” in Table C–2 of subpart C of this part). For each flare, calculate CO₂, CH₄, and N₂O emissions using the methodology specified in § 98.253(b)(1) through (b)(3).

(c) Mass balance for each petrochemical process unit. Calculate the emissions of CO₂ from each process unit, for each calendar month as described in paragraphs (c)(1) through (c)(5) of this section.

(1) For each gaseous and liquid feedstock and product, measure the volume or mass used or produced each calendar month with a flow meter by following the procedures specified in § 98.244(b)(2). Alternatively, for liquids, you may calculate the volume used or collected in each month based on measurements of the liquid level in a storage tank at least once per month (and just prior to each change in direction of the level of the liquid) following the procedures specified in § 98.244(b)(3). Fuels used for combustion purposes are not considered to be feedstocks.

(2) For each solid feedstock and product, measure the mass used or produced each calendar month by following the procedures specified in § 98.244(b)(1).

(3) Collect a sample of each feedstock and product at least once per month and determine the carbon content of each sample according to the procedures in § 98.244(b)(4). Alternatively, you may use the results of analyses conducted by a fuel or

feedstock supplier, provided the sampling and analysis are conducted at least once per month using any of the procedures specified in § 98.244(b)(4). If multiple valid carbon content measurements are made during the monthly measurement period, average them arithmetically.

(4) If you determine that the monthly average concentration of a specific compound in a feedstock or product is greater than 99.5 percent by volume (or mass for liquids and solids), then as an alternative to the sampling and analysis specified in paragraph (c)(3) of this section, you may calculate the carbon content assuming 100 percent of that feedstock or product is the specific compound during periods of normal operation. You must maintain records of any determination made in accordance with this paragraph (c)(4) along with all supporting data, calculations, and other information. This alternative may not be used for products during periods of operation when off-specification product is produced. You must reevaluate determinations made under this paragraph (c)(4) after any process change that affects the feedstock or product composition. You must keep records of the process change and the corresponding composition determinations. If the feedstock or product composition changes so that the average monthly concentration falls below 99.5 percent, you are no longer permitted to use this alternative method.

(5) Calculate the CO₂ mass emissions for each petrochemical process unit using Equations X-1 through X-4 of this section.

(i) Gaseous feedstocks and products. Use Equation X-1 of this section to calculate the net annual carbon input or output from gaseous feedstocks and products. Note that the result will be a negative value if there are no gaseous feedstocks in the process but there are gaseous products.

$$C_g = \sum_{n=1}^{12} \left[\sum_{i=1}^{jork} \left[(F_{gf})_{i,n} * (CC_{gf})_{i,n} * \frac{(MW_f)_i}{MVC} - (P_{gp})_{i,n} * (CC_{gp})_{i,n} * \frac{(MW_p)_i}{MVC} \right] \right] \quad (\text{Eq. X-1})$$

Where:

C_g = Annual net contribution to calculated emissions from carbon (C) in gaseous materials (kilograms/year, kg/yr).

$(F_{gf})_{i,n}$ = Volume of gaseous feedstock i introduced in month ‘n’ (standard cubic feet, scf).
 $(CC_{gf})_{i,n}$ = Average carbon content of the gaseous feedstock i for month ‘n’ (kg C per kg of feedstock).
 $(MW_f)_i$ = Molecular weight of gaseous feedstock i (kg/kg-mole).
MVC = Molar volume conversion factor (849.5 scf per kg-mole at standard conditions).
 $(P_{gp})_{i,n}$ = Volume of gaseous product i produced in month ‘n’ (scf).
 $(CC_{gp})_{i,n}$ = Average carbon content of gaseous product i, including streams containing CO₂ recovered for sale or use in another process, for month ‘n’ (kg C per kg of product).
 $(MW_p)_i$ = Molecular weight of gaseous product i (kg/kg-mole).
j = Number of feedstocks.
k = Number of products.

(ii) Liquid feedstocks and products. Use Equation X-2 of this section to calculate the net carbon input or output from liquid feedstocks and products. Note that the result will be a negative value if there are no liquid feedstocks in the process but there are liquid products.

$$C_l = \sum_{n=1}^{12} \left[\sum_{i=1}^{jork} \left[(F_{lf})_{i,n} * (CC_{lf})_{i,n} - (P_{lp})_{i,n} * (CC_{lp})_{i,n} \right] \right] \quad (\text{Eq. X-2})$$

Where:

C_l = Annual net contribution to calculated emissions from carbon in liquid materials, including liquid organic wastes (kg/yr).
 $(F_{lf})_{i,n}$ = Volume or mass of liquid feedstock i introduced in month ‘n’ (gallons or kg).
 $(CC_{lf})_{i,n}$ = Average carbon content of liquid feedstock i for month ‘n’ (kg C per gallon or kg of feedstock).
 $(P_{lp})_{i,n}$ = Volume or mass of liquid product i produced in month ‘n’ (gallons or kg).
 $(CC_{lp})_{i,n}$ = Average carbon content of liquid product i, including organic liquid wastes, for month ‘n’ (kg C per gallon or kg of product).
j = Number of feedstocks.
k = Number of products.

(iii) Solid feedstocks and products. Use Equation X-3 of this section to calculate the net annual carbon input or output from solid feedstocks and products. Note that the result will be a negative value if there are no solid feedstocks in the process but there are solid products.

$$C_s = \sum_{n=1}^{12} \left[\sum_{i=1}^{jork} \left[(F_{sf})_{i,n} * (CC_{sf})_{i,n} - (P_{sp})_{i,n} * (CC_{sp})_{i,n} \right] \right] \quad (\text{Eq. X-3})$$

Where:

C_s = Annual net contribution to calculated emissions from carbon in solid materials (kg/yr).

$(F_{sf})_{i,n}$ = Mass of solid feedstock i introduced in month ‘n’ (kg).

$(CC_{sf})_{i,n}$ = Average carbon content of solid feedstock i for month ‘n’ (kg C per kg of feedstock).

$(P_{sp})_{i,n}$ = Mass of solid product i produced in month ‘n’ (kg).

$(CC_{sp})_{i,n}$ = Average carbon content of solid product i in month ‘n’ (kg C per kg of product).

j = Number of feedstocks.

k = Number of products.

(iv) Annual emissions. Use the results from Equations X–1 through X–3 of this section, as applicable, in Equation X–4 of this section to calculate annual CO₂ emissions.

$$CO_2 = 0.001 * (C_g + C_l + C_s) \quad (\text{Eq. X-4})$$

Where:

CO_2 = Annual CO₂ mass emissions from process operations and process off-gas combustion (metric tons/year).

0.001 = Conversion factor from kg to metric tons.

44 = Molecular weight of CO₂ (kg/kg-mole).

12 = Atomic weight of carbon (C) (kg/kgmole).

(d) Optional combustion methodology for ethylene production processes. For any ethylene production process, calculate CO₂ emissions from combustion of fuel that contains ethylene process off-gas using the Tier 3 or Tier 4 methodology in subpart C of this part, and calculate CH₄ and N₂O emissions using the applicable procedures in § 98.33(c) (use the emission factors for ‘Petroleum’ in Table C–2 of subpart C of this part (General Stationary Fuel Combustion Sources)). You are not required to use the same Tier for each stationary combustion unit that burns ethylene process off-gas. For each

flare, calculate CO₂, CH₄, and N₂O emissions using the methodology specified in § 98.253(b)(1) through (b)(3).

§ 98.244 Monitoring and QA/QC requirements.

(a) If you use CEMS to determine emissions from process vents, you must comply with the procedures specified in § 98.34(c).

(b) If you use the mass balance methodology in § 98.243(c), use the procedures specified in paragraphs (b)(1) through (b)(4) of this section to determine feedstock and product flows and carbon contents.

(1) Operate and maintain belt scales or other weighing devices as described in Specifications, Tolerances, and Other Technical Requirements For Weighing and Measuring Devices NIST Handbook 44 (2009) (incorporated by reference, see § 98.7) or follow procedures specified by the measurement device manufacturer. Calibrate the measurement device according to the procedures specified by the method, the procedures specified by the manufacturer, or § 98.3(i). Recalibrate either biennially or at the minimum frequency specified by the manufacturer.

(2) Operate and maintain all flow meters for gas and liquid feedstocks and products by following the procedures in § 98.3(i) and using any of the flow meter methods specified in paragraphs (b)(2)(i) through (b)(2)(xv) of this section, as applicable, use a standard method published by a consensus-based standards organization (e.g., ASTM, API, etc.), or follow procedures specified by the flow meter manufacturer or § 98.3(i). Recalibrate each flow meter either biennially or at the minimum frequency specified by the manufacturer.

(i) ASME MFC-3M-2004 Measurement of Fluid Flow in Pipes Using Orifice, Nozzle, and Venturi (incorporated by reference, see § 98.7).

(ii) ASME MFC-4M-1986 (Reaffirmed 1997) Measurement of Gas Flow by Turbine Meters (incorporated by reference, see § 98.7).

(iii) ASME MFC-5M-1985 (Reaffirmed 1994) Measurement of Liquid Flow in Closed Conduits Using Transit-Time Ultrasonic Flowmeters (incorporated by reference, see § 98.7).

- (iv) ASME MFC–6M–1998 Measurement of Fluid Flow in Pipes Using Vortex Flowmeters (incorporated by reference, see § 98.7).
 - (v) ASME MFC–7M–1987 (Reaffirmed 1992) Measurement of Gas Flow by Means of Critical Flow Venturi Nozzles (incorporated by reference, see § 98.7).
 - (vi) ASME MFC–9M–1988 (Reaffirmed 2001) Measurement of Liquid Flow in Closed Conduits by Weighing Method (incorporated by reference, see § 98.7).
 - (vii) ASME MFC–11M–2006 Measurement of Fluid Flow by Means of Coriolis Mass Flowmeters (incorporated by reference, see § 98.7).
 - (viii) ASME MFC–14M–2003 (Reaffirmed 2008), Measurement of Fluid Flow Using Small Bore Precision Orifice Meters (incorporated by reference, see § 98.7).
 - (ix) ASME MFC–16–2007 Measurement of Liquid Flow in Closed Conduits with Electromagnetic Flowmeters (incorporated by reference, see § 98.7).
 - (x) ASME MFC–18M–2001 (Reaffirmed 2006), Measurement of Fluid Flow Using Variable Area Meters (incorporated by reference, see § 98.7).
 - (xi) ASME MFC–22–2007 Measurement of Liquid by Turbine Flowmeters (incorporated by reference, see § 98.7).
 - (xii) AGA Report No. 3: Orifice Metering of Natural Gas and Other Related Hydrocarbon Fluids, Part 1: General Equations and Uncertainty Guidelines (1990), Part 2: Specification and Installation Requirements (2000) (incorporated by reference, see § 98.7).
 - (xiii) AGA Transmission Measurement Committee Report No. 7: Measurement of Natural Gas by Turbine Meter (2006)/February (incorporated by reference, see § 98.7).
 - (xiv) AGA Report No. 11: Measurement of Natural Gas by Coriolis Meter (2003) (incorporated by reference, see § 98.7).
 - (xv) ISO 8316: Measurement of Liquid Flow in Closed Conduits—Method by Collection of the Liquid in a Volumetric Tank (1987–10–01) First Edition (incorporated by reference, see § 98.7).
- (3) Perform tank level measurements (if used to determine feedstock or product flows) according to any standard method published by a consensus-based standards organization (e.g., ASTM, API, etc.) or follow procedures specified by the

measurement device manufacturer or § 98.3(i). Calibrate the measurement devices prior to the effective date of the rule, and recalibrate either biennially or at the minimum frequency specified by the manufacturer or § 98.3(i).

(4) Use any of the standard methods specified in paragraphs (b)(4)(i) through (b)(4)(x) of this section, as applicable, to determine the carbon content or composition of feedstocks and products and the average molecular weight of gaseous feedstocks and products. Calibrate instruments in accordance with the method and as specified in paragraphs (b)(4)(i) through (b)(4)(x), as applicable. For coal used as a feedstock, the samples for carbon content determinations shall be taken at a location that is representative of the coal feedstock used during the corresponding monthly period. For carbon black products, samples shall be taken of each grade or type of product produced during the monthly period. Samples of coal feedstock or carbon black product for carbon content determinations may be either grab samples collected and analyzed monthly or a composite of samples collected more frequently and analyzed monthly. Analyses conducted in accordance with methods specified in paragraphs (b)(4)(i) through (b)(4)(x) of this section may be performed by the owner or operator, by an independent laboratory, or by the supplier of a feedstock.

(i) ASTM D1945–03, Standard Test Method for Analysis of Natural Gas by Gas Chromatography (incorporated by reference, see § 98.7).

(ii) ASTM D6060–96 (Reapproved 2001) Standard Practice for Sampling of Process Vents With a Portable Gas Chromatograph (incorporated by reference, see § 98.7).

(iii) ASTM D2505–88(Reapproved 2004)e1 Standard Test Method for Ethylene, Other Hydrocarbons, and Carbon Dioxide in High-Purity Ethylene by Gas Chromatography (incorporated by reference, see § 98.7).

(iv) ASTM UOP539–97 Refinery Gas Analysis by Gas Chromatography (incorporated by reference, see § 98.7).

(v) ASTM D3176–89 (Reapproved 2002) Standard Practice Method for Ultimate Analysis of Coal and Coke (incorporated by reference, see § 98.7).

(vi) ASTM D5291–02 (Reapproved 2007) Standard Test Methods for Instrumental Determination of Carbon, Hydrogen, and Nitrogen in Petroleum Products and Lubricants (incorporated by reference, see § 98.7).

(vii) ASTM D5373–08 Standard Test Methods for Instrumental Determination of Carbon, Hydrogen, and Nitrogen in Laboratory Samples of Coal (incorporated by reference, see § 98.7).

(viii) Methods 8031, 8021, or 8015 in “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,” EPA Publication No. SW–846, Third Edition, September 1986, as amended by Update I, November 15, 1992.

(ix) Method 18 at 40 CFR part 60, appendix A–6.

(x) Performance Specification 9 in 40 CFR part 60, appendix B for continuous online gas analyzers. The 7-day calibration error test period must be completed prior to the effective date of the rule.

§ 98.245 Procedures for estimating missing data.

For missing feedstock flow rates, product flow rates, and carbon contents, use the same procedures as for missing flow rates and carbon contents for fuels as specified in § 98.35.

§ 98.246 Data reporting requirements.

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

(a) If you use the mass balance methodology in § 98.243(c), you must report the information specified in paragraphs (a)(1) through (a)(10) of this section for each type of petrochemical produced, reported by process unit.

(1) The petrochemical process unit ID number or other appropriate descriptor.

(2) The type of petrochemical produced, names of other products, and names of carbon-containing feedstocks.

(3) Annual CO₂ emissions calculated using Equation X–4 of this subpart.

(4) Each of the monthly volume, mass, and carbon content values used in Equations X–1 through X–3 of this subpart (i.e., the directly measured values, substitute values,

or the calculated values based on other measured data such as tank levels or gas composition) and the molecular weights for gaseous feedstocks and products used in Equation X-1 of this subpart. Indicate whether you used the alternative to sampling and analysis specified in § 98.243(c)(4).

(5) Annual quantity of each type of petrochemical produced from each process unit (metric tons).

(6) Name of each method listed in § 98.244 used to determine a measured parameter (or description of manufacturer's recommended method).

(7) The dates and summarized results (e.g., percent calibration error) of the calibrations of each measurement device.

(8) Identification of each combustion unit that burned both process off-gas and supplemental fuel.

(9) If you comply with the alternative to sampling and analysis specified in § 98.243(c)(4), the amount of time during which off-specification product was produced, the volume or mass of off-specification product produced, and if applicable, the date of any process change that reduced the composition to less than 99.5 percent.

(10) You may elect to report the flow and carbon content of wastewater, and you may elect to report the carbon content of hydrocarbons in fugitive emissions and in process vents that are not controlled with a combustion device. These values may be estimated based on engineering analyses. These values are not to be used in the mass balance calculation.

(b) If you use CEMS to measure CO₂ emissions in accordance with § 98.243(b), then you must report the relevant information required under § 98.36 for the Tier 4 Calculation Methodology and the information listed in paragraphs (b)(1) through (b)(6) of this section.

(1) For CEMS used on stacks for stationary combustion units, report the relevant information required under § 98.36 for the Tier 4 calculation methodology.

(2) For CEMS used on stacks that are not used for stationary combustion units, report the information required under § 98.36(e)(2)(vi) and (vii).

(3) The petrochemical process unit ID or other appropriate descriptor, and the type of petrochemical produced.

(4) The CO₂ emissions from each stack and the combined CO₂ emissions from all stacks (except flare stacks) that handle process vent emissions and emissions from stationary combustion units that burn process off-gas for the petrochemical process unit. If a stationary combustion source serves multiple petrochemical process units or units other than the petrochemical process unit, estimate based on engineering judgment the fraction of fuel energy and emissions attributable to each petrochemical process unit.

(5) The CH₄ and N₂O emissions from each stack and the combined CH₄ and N₂O emissions from all stationary combustion units that burn process off-gas from the petrochemical process unit, the cumulative annual heat input used in Equation C-10 in § 98.33(c) of this subpart, and the annual flow of each fuel on which this heat input is based.

(6) ID or other appropriate descriptor of each stationary combustion unit that burns process off-gas.

(7) Information listed in § 98.256(e) of subpart Y of this part for each flare that burns process off-gas.

(8) Annual quantity of each type of petrochemical produced from each process unit (metric tons).

(c) If you comply with the combustion methodology specified in § 98.243(d), you must report under this subpart the information listed in paragraphs (c)(1) through (c)(4) of this section.

(1) For each stationary combustion unit that burns ethylene process off-gas (or group of stationary sources with a common pipe), the relevant information listed in § 98.36 for the selected Tier 3 or Tier 4 methodology. If a stationary combustion source serves multiple ethylene process units or units other than the ethylene process unit, estimate based on engineering judgment the fraction of fuel energy and emissions attributable to each ethylene process unit.

(2) Information listed in § 98.256(e) for each flare that burns ethylene process off-gas.

(3) Name and annual quantity of each feedstock.

(4) Annual quantity of each type of petrochemical produced from each process unit (metric tons).

§ 98.247 Records that must be retained.

In addition to the recordkeeping requirements in § 98.3(g), you must retain the records specified in paragraphs (a) through (c) of this section, as applicable.

(a) If you comply with the CEMS measurement methodology in § 98.243(b), then you must retain under this subpart the records required for the Tier 4 Calculation Methodology in § 98.37.

(b) If you comply with the mass balance methodology in § 98.243(c), then you must retain records of the information listed in paragraphs (b)(1) through (b)(3) of this section.

(1) Results of feedstock or product composition determinations conducted in accordance with § 98.243(c)(4).

(2) Start and end times and calculated carbon contents for time periods when off-specification product is produced, if you comply with the alternative methodology in § 98.243(c)(4) for determining carbon content of feedstock or product.

(3) A part of the monitoring plan required under § 98.3(g)(5), record the estimated accuracy of measurement devices and the technical basis for these estimates.

(c) If you comply with the combustion methodology in § 98.243(d), then you must retain under this subpart the records required for the Tier 3 and/or Tier 4 Calculation Methodologies in § 98.37.

§ 98.248 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.

Product, as used in § 98.243, means each of the following carbon-containing outputs from a process: the petrochemical, recovered byproducts, and liquid organic wastes that are not incinerated onsite. Product does not include process vent emissions, fugitive emissions, or wastewater.