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*Unofficial electronic compilation of the  
U.S. EPA Final Rule on Mandatory Reporting of Greenhouse Gases  
incorporated by reference in California's Regulation for the  
Mandatory Reporting of Greenhouse Gas Emissions*

### Unofficial Electronic Compilation

*This unofficial electronic compilation is provided by the California Air Resources Board (ARB) solely for the reader's convenience.*

*ARB's Regulation for the Mandatory Reporting of Greenhouse Gas Emissions (title 17, California Code of Regulations (CCR), sections 95100-95157) incorporated by reference certain requirements promulgated by the United States Environmental Protection Agency (U.S. EPA) in its Final Rule on Mandatory Reporting of Greenhouse Gases (Title 40, Code of Federal Regulations (CFR), Part 98). Specifically, section 95100(c) of ARB's regulation incorporated those requirements promulgated by U.S. EPA as published in the Federal Register on October 30, 2009, July 12, 2010, September 22, 2010, October 28, 2010, November 30, 2010, December 17, 2010, and April 25, 2011.*

*This compilation combines the various incorporated Federal Register versions into one document for the reader's convenience; however, this compilation is not an official edition of either the CFR or the CCR. While reasonable steps have been taken to make this unofficial compilation accurate, the officially published requirements, found within the incorporated Federal Register notices with the dates listed above, take precedence if there are any discrepancies.*

### Official Legal Versions

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**40 CFR Part 98**  
**Subpart Q**  
**Mandatory Reporting of Greenhouse Gases**

**PART 98—MANDATORY GREENHOUSE GAS REPORTING**

**Subpart Q—Iron and Steel Production**

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

The iron and steel production source category includes facilities with any of the following processes: taconite iron ore processing, integrated iron and steel manufacturing, cokemaking not colocated with an integrated iron and steel manufacturing process, and electric arc furnace (EAF) steelmaking not colocated with an integrated iron and steel manufacturing process. Integrated iron and steel manufacturing means the production of steel from iron ore or iron ore pellets. At a minimum, an integrated iron and steel manufacturing process has a basic oxygen furnace for refining molten iron into steel. Each cokemaking process and EAF process located at a facility with an integrated iron and steel manufacturing process is part of the integrated iron and steel manufacturing facility.

**§98.171 Reporting threshold.**

You must report GHG emissions under this subpart if your facility contains an iron and steel production process and the facility meets the requirements of either §98.2(a)(1) or (2).

**§98.172 GHGs to report.**

(a) You must report under subpart C of this part (General Stationary Fuel Combustion Sources) the emissions of CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O from each stationary combustion unit following the requirements of subpart C except for flares. Stationary combustion units include, but are not limited to, by-product recovery coke oven battery combustion stacks, blast furnace stoves, boilers, process heaters, reheat furnaces, annealing furnaces, flame suppression, ladle reheaters, and other miscellaneous combustion sources.

(b) You must report CO<sub>2</sub> 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<sub>2</sub> emission factors for coke oven gas and blast furnace gas from Table C-1 of subpart C in Equation Y-2 and Y-3 of subpart Y. You must report CH<sub>4</sub> and N<sub>2</sub>O 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 of subpart C of this part.

(c) You must report process CO<sub>2</sub> 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.

**§98.173 Calculating GHG emissions.**

You must calculate and report the annual process CO<sub>2</sub> 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. Calculate and report the annual process CO<sub>2</sub> emissions from the coke pushing process according to paragraph (c) of this section.

(a) Calculate and report under this subpart the process CO<sub>2</sub> emissions by operating and maintaining CEMS according to the Tier 4 Calculation Methodology in §98.33(a)(4) and all associated requirements for Tier 4 in subpart C of this part (General Stationary Fuel Combustion Sources).

(b) Calculate and report under this subpart the process CO<sub>2</sub> emissions using the procedure in paragraph (b)(1) or (b)(2) of this section.

(1) Carbon mass balance method. Calculate the annual mass emissions of CO<sub>2</sub> for the process as specified in paragraphs (b)(1)(i) through (b)(1)(vii) of this section. The calculations are based on the annual mass of inputs and outputs to the process and an annual analysis of the respective weight fraction of carbon as determined according to the procedures in §98.174(b). If you have a process input or output other than CO<sub>2</sub> in the exhaust gas that contains carbon that is not included in Equations Q-1 through Q-7 of this section, you must account for the carbon and mass rate of that process input or output in your calculations according to the procedures in §98.174(b)(5).

(i) For taconite indurating furnaces, estimate CO<sub>2</sub> emissions using Equation Q-1 of this section.

$$CO_2 = \frac{44}{12} * [(F_s) * (C_{sf}) + (F_g) * (C_{gf}) * \frac{MW}{MVC} * 0.001 + (F_l) * (C_{lf}) * 0.001 + (O) * (C_o) - (P) * (C_p) - (R) * (C_R)] \quad (\text{Eq. Q-1})$$

Where:

- CO<sub>2</sub> = Annual CO<sub>2</sub> mass emissions from the taconite indurating furnace (metric tons).
- 44/12 = Ratio of molecular weights, CO<sub>2</sub> to carbon.
- (F<sub>s</sub>) = Annual mass of the solid fuel combusted (metric tons).
- (C<sub>sf</sub>) = Carbon content of the solid fuel, from the fuel analysis (percent by weight, expressed as a decimal fraction, e.g., 95% = 0.95).
- (F<sub>g</sub>) = Annual volume of the gaseous fuel combusted (scf).
- (C<sub>gf</sub>) = Average carbon content of the gaseous fuel, from the fuel analysis results (kg C per kg of fuel).
- MW = Molecular weight of the gaseous fuel (kg/kg-mole).
- MVC = Molar volume conversion factor (849.5 scf per kg-mole at standard conditions).
- 0.001 = Conversion factor from kg to metric tons.

- (F<sub>l</sub>) = Annual volume of the liquid fuel combusted (gallons).  
 (C<sub>lf</sub>) = Carbon content of the liquid fuel, from the fuel analysis results (kg C per gallon of fuel).  
 (O) = Annual mass of greenball (taconite) pellets fed to the furnace (metric tons).  
 (C<sub>o</sub>) = Carbon content of the greenball (taconite) pellets, from the carbon analysis results (percent by weight, expressed as a decimal fraction).  
 (P) = Annual mass of fired pellets produced by the furnace (metric tons).  
 (C<sub>p</sub>) = Carbon content of the fired pellets, from the carbon analysis results (percent by weight, expressed as a decimal fraction).  
 (R) = Annual mass of air pollution control residue collected (metric tons).  
 (C<sub>R</sub>) = Carbon content of the air pollution control residue, from the carbon analysis results (percent by weight, expressed as a decimal fraction).

(ii) For basic oxygen process furnaces, estimate CO<sub>2</sub> emissions using Equation Q-2 of this section.

$$CO_2 = \frac{44}{12} * [(Iron) * (C_{Iron}) + (Scrap) * (C_{Scrap}) + (Flux) * (C_{Flux}) + (Carbon) * (C_{Carbon}) - (Steel) * (C_{Steel}) - (Slag) * (C_{Slag}) - (R) * (C_R)] \quad (\text{Eq. Q-2})$$

Where:

- CO<sub>2</sub> = Annual CO<sub>2</sub> mass emissions from the basic oxygen furnace (metric tons).  
 44/12 = Ratio of molecular weights, CO<sub>2</sub> to carbon.  
 (Iron) = Annual mass of molten iron charged to the furnace (metric tons).  
 (C<sub>Iron</sub>) = Carbon content of the molten iron, from the carbon analysis results (percent by weight, expressed as a decimal fraction).  
 (Scrap) = Annual mass of ferrous scrap charged to the furnace (metric tons).  
 (C<sub>Scrap</sub>) = Carbon content of the ferrous scrap, from the carbon analysis results (percent by weight, expressed as a decimal fraction).  
 (Flux) = Annual mass of flux materials (e.g., limestone, dolomite) charged to the furnace (metric tons).  
 (C<sub>Flux</sub>) = Carbon content of the flux materials, from the carbon analysis results (percent by weight, expressed as a decimal fraction).  
 (Carbon) = Annual mass of carbonaceous materials (e.g., coal, coke) charged to the furnace (metric tons).  
 (C<sub>Carbon</sub>) = Carbon content of the carbonaceous materials, from the carbon analysis results (percent by weight, expressed as a decimal fraction).  
 (Steel) = Annual mass of molten raw steel produced by the furnace (metric tons).  
 (C<sub>Steel</sub>) = Carbon content of the steel, from the carbon analysis results (percent by weight, expressed as a decimal fraction).  
 (Slag) = Annual mass of slag produced by the furnace (metric tons).

- (C<sub>Slag</sub>) = Carbon content of the slag, from the carbon analysis (percent by weight, expressed as a decimal fraction).
- (R) = Annual mass of air pollution control residue collected (metric tons).
- (C<sub>R</sub>) = Carbon content of the air pollution control residue, from the carbon analysis results (percent by weight, expressed as a decimal fraction).
- (iii) For non-recovery coke oven batteries, estimate CO<sub>2</sub> emissions using Equation Q-3 of this section.

$$CO_2 = \frac{44}{12} * [(Coal) * (C_{Coal}) - (Coke) * (C_{Coke}) - (R) * (C_R)] \quad (\text{Eq. Q-3})$$

Where:

- CO<sub>2</sub> = Annual CO<sub>2</sub> mass emissions from the non-recovery coke oven battery (metric tons).
- 44/12 = Ratio of molecular weights, CO<sub>2</sub> to carbon.
- (Coal) = Annual mass of coal charged to the battery (metric tons).
- (C<sub>Coal</sub>) = Carbon content of the coal, from the carbon analysis results (percent by weight, expressed as a decimal fraction).
- (Coke) = Annual mass of coke produced by the battery (metric tons).
- (C<sub>Coke</sub>) = Carbon content of the coke, from the carbon analysis results (percent by weight, expressed as a decimal fraction).
- (R) = Annual mass of air pollution control residue collected (metric tons).
- (C<sub>R</sub>) = Carbon content of the air pollution control residue, from the carbon analysis results (percent by weight, expressed as a decimal fraction).
- (iv) For sinter processes, estimate CO<sub>2</sub> emissions using Equation Q-4 of this section.

$$CO_2 = \frac{44}{12} * [(F_g) * (C_{gf}) * \frac{MW}{MVC} * 0.001 + (Feed) * (C_{Feed}) - (Sinter) * (C_{Sinter}) - (R) * (C_R)] \quad (\text{Eq. Q-4})$$

Where:

- CO<sub>2</sub> = Annual CO<sub>2</sub> mass emissions from the sinter process (metric tons).
- 44/12 = Ratio of molecular weights, CO<sub>2</sub> to carbon.
- (F<sub>g</sub>) = Annual volume of the gaseous fuel combusted (scf).
- (C<sub>gf</sub>) = Carbon content of the gaseous fuel, from the fuel analysis results (kg C per kg of fuel).
- MW = Molecular weight of the gaseous fuel (kg/kg-mole).
- MVC = Molar volume conversion factor (849.5 scf per kg-mole at standard conditions).
- 0.001 = Conversion factor from kg to metric tons.
- (Feed) = Annual mass of sinter feed material (metric tons).

- (C<sub>Feed</sub>) = Carbon content of the mixed sinter feed materials that form the bed entering the sintering machine, from the carbon analysis results (percent by weight, expressed as a decimal fraction).
- (Sinter) = Annual mass of sinter produced (metric tons).
- (C<sub>Sinter</sub>) = Carbon content of the sinter pellets, from the carbon analysis results (percent by weight, expressed as a decimal fraction).
- (R) = Annual mass of air pollution control residue collected (metric tons).
- (C<sub>R</sub>) = Carbon content of the air pollution control residue, from the carbon analysis results (percent by weight, expressed as a decimal fraction).

(v) For EAFs, estimate CO<sub>2</sub> emissions using Equation Q-5 of this section.

$$CO_2 = \frac{44}{12} * [(Iron) * (C_{Iron}) + (Scrap) * (C_{Scrap}) + (Flux) * (C_f) + (Electrode) * (C_{Electrode}) + (Carbon) * (C_c) - (Steel) * (C_{Steel}) - (Slag) * (C_{Slag}) - (R) * (C_R)] \quad (Eq. Q-5)$$

Where:

- CO<sub>2</sub> = Annual CO<sub>2</sub> mass emissions from the EAF (metric tons).
- 44/12 = Ratio of molecular weights, CO<sub>2</sub> to carbon.
- (Iron) = Annual mass of direct reduced iron (if any) charged to the furnace (metric tons).
- (C<sub>Iron</sub>) = Carbon content of the direct reduced iron, from the carbon analysis results (percent by weight, expressed as a decimal fraction).
- (Scrap) = Annual mass of ferrous scrap charged to the furnace (metric tons).
- (C<sub>Scrap</sub>) = Carbon content of the ferrous scrap, from the carbon analysis results (percent by weight, expressed as a decimal fraction).
- (Flux) = Annual mass of flux materials (e.g., limestone, dolomite) charged to the furnace (metric tons).
- (C<sub>Flux</sub>) = Carbon content of the flux materials, from the carbon analysis results (percent by weight, expressed as a decimal fraction).
- (Electrode) = Annual mass of carbon electrode consumed (metric tons).
- (C<sub>Electrode</sub>) = Carbon content of the carbon electrode, from the carbon analysis results (percent by weight, expressed as a decimal fraction).
- (Carbon) = Annual mass of carbonaceous materials (e.g., coal, coke) charged to the furnace (metric tons).
- (C<sub>Carbon</sub>) = Carbon content of the carbonaceous materials, from the carbon analysis results (percent by weight, expressed as a decimal fraction).
- (Steel) = Annual mass of molten raw steel produced by the furnace (metric tons).
- (C<sub>Steel</sub>) = Carbon content of the steel, from the carbon analysis results (percent by weight, expressed as a decimal fraction).

- (Slag) = Annual mass of slag produced by the furnace (metric tons).  
 (C<sub>Slag</sub>) = Carbon content of the slag, from the carbon analysis results (percent by weight, expressed as a decimal fraction).  
 (R) = Annual mass of air pollution control residue collected (metric tons).  
 (C<sub>R</sub>) = Carbon content of the air pollution control residue, from the carbon analysis results (percent by weight, expressed as a decimal fraction).

(vi) For decarburization vessels, estimate CO<sub>2</sub> emissions using Equation Q-6 of this section.

$$CO_2 = \frac{44}{12} * (Steel) * [(C_{Steelin}) - (C_{Steelout})] - (R) * (C_R) \quad (\text{Eq. Q-6})$$

Where:

- CO<sub>2</sub> = Annual CO<sub>2</sub> mass emissions from the decarburization vessel (metric tons).  
 44/12 = Ratio of molecular weights, CO<sub>2</sub> to carbon.  
 (Steel) = Annual mass of molten steel charged to the vessel (metric tons).  
 (C<sub>Steelin</sub>) = Carbon content of the molten steel before decarburization, from the carbon analysis results (percent by weight, expressed as a decimal fraction).  
 (C<sub>Steelout</sub>) = Carbon content of the molten steel after decarburization, from the carbon analysis results (percent by weight, expressed as a decimal fraction).  
 (R) = Annual mass of air pollution control residue collected (metric tons).  
 (C<sub>R</sub>) = Carbon content of the air pollution control residue, from the carbon analysis results (percent by weight, expressed as a decimal fraction).

(vii) For direct reduction furnaces, estimate CO<sub>2</sub> emissions using Equation Q-7 of this section.

$$CO_2 = \frac{44}{12} * [(F_g) * (C_{gf}) * \frac{MW}{MVC} * 0.001 + (Ore) * (C_{Ore}) + (Carbon) * (C_{Carbon}) + (Other) * (C_{Other}) - (Iron) * (C_{Iron}) - (NM) * (C_{NM}) - (R) * (C_R)] \quad (\text{Eq. Q-7})$$

Where:

- CO<sub>2</sub> = Annual CO<sub>2</sub> mass emissions from the direct reduction furnace (metric tons).  
 44/12 = Ratio of molecular weights, CO<sub>2</sub> to carbon.  
 (F<sub>g</sub>) = Annual volume of the gaseous fuel combusted (scf).  
 (C<sub>gf</sub>) = Carbon content of the gaseous fuel, from the fuel analysis results (kg C per kg of fuel).  
 MW = Molecular weight of the gaseous fuel (kg/kg-mole).  
 MVC = Molar volume conversion factor (849.5 scf per kg-mole at standard conditions).  
 0.001 = Conversion factor from kg to metric tons.



- (Ore) = Annual mass of iron ore or iron ore pellets fed to the furnace (metric tons).
- (C<sub>Ore</sub>) = Carbon content of the iron ore or iron ore pellets, from the carbon analysis results (percent by weight, expressed as a decimal fraction).
- (Carbon) = Annual mass of carbonaceous materials (e.g., coal, coke) charged to the furnace (metric tons).
- (C<sub>Carbon</sub>) = Carbon content of the carbonaceous materials, from the carbon analysis results (percent by weight, expressed as a decimal fraction).
- (Other) = Annual mass of other materials charged to the furnace (metric tons).
- (C<sub>Other</sub>) = Average carbon content of the other materials charged to the furnace, from the carbon analysis results (percent by weight, expressed as a decimal fraction).
- (Iron) = Annual mass of iron produced (metric tons).
- (C<sub>Iron</sub>) = Carbon content of the iron, from the carbon analysis results (percent by weight, expressed as a decimal fraction).
- (NM) = Annual mass of non-metallic materials produced by the furnace (metric tons).
- (C<sub>NM</sub>) = Carbon content of the non-metallic materials, from the carbon analysis results (percent by weight, expressed as a decimal fraction).
- (R) = Annual mass of air pollution control residue collected (metric tons).
- (C<sub>R</sub>) = Carbon content of the air pollution control residue, from the carbon analysis results (percent by weight, expressed as a decimal fraction).

(2) Site-specific emission factor method. Conduct a performance test and measure CO<sub>2</sub> emissions from all exhaust stacks for the process and measure either the feed rate of materials into the process or the production rate during the test as described in paragraphs (b)(2)(i) through (b)(2)(iv) of this section.

(i) You must measure the process production rate or process feed rate, as applicable, during the performance test according to the procedures in §98.174(c)(5) and calculate the average rate for the test period in metric tons per hour.

(ii) You must calculate the hourly CO<sub>2</sub> emission rate using Equation Q-8 of this section and determine the average hourly CO<sub>2</sub> emission rate for the test.

$$CO_2 = 5.18 \times 10^{-7} * C_{CO_2} * Q * \left( \frac{100 - \%H_2O}{100} \right) \quad (\text{Eq. Q-8})$$

Where:

- CO<sub>2</sub> = CO<sub>2</sub> mass emission rate, corrected for moisture (metric tons/hr).
- 5.18 x 10<sup>-7</sup> = Conversion factor (metric tons/scf-% CO<sub>2</sub>).
- CCO<sub>2</sub> = Hourly CO<sub>2</sub> concentration, dry basis (% CO<sub>2</sub>).
- Q = Hourly stack gas volumetric flow rate (scfh).
- %H<sub>2</sub>O = Hourly moisture percentage in the stack gas.

(iii) You must calculate a site-specific emission factor for the process in metric tons of CO<sub>2</sub> per metric ton of feed or production, as applicable, by dividing the average

hourly CO<sub>2</sub> emission rate during the test by the average hourly feed or production rate during the test.

(iv) You must calculate CO<sub>2</sub> emissions for the process by multiplying the emission factor by the total amount of feed or production, as applicable, for the reporting period.

(c) You must determine emissions of CO<sub>2</sub> from the coke pushing process in mtCO<sub>2</sub>e by multiplying the metric tons of coal charged to the coke ovens during the reporting period by 0.008.

(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<sub>2</sub> 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. The owner or operator shall report under this subpart the combined stack emissions according to the Tier 4 Calculation Methodology in §98.33(a)(4) and all associated requirements for Tier 4 in subpart C of this part (General Stationary Fuel Combustion Sources).

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

(a) If you operate and maintain a CEMS that measures CO<sub>2</sub> emissions consistent with subpart C of this part, you must meet the monitoring and QA/QC requirements of §98.34(c).

(b) If you determine CO<sub>2</sub> emissions using the carbon mass balance procedure in §98.173(b)(1), you must:

(1) Except as provided in paragraph (b)(4) of this section, determine the mass of each process input and output other than fuels using the same plant instruments or procedures that are used for accounting purposes (such as weigh hoppers, belt weigh feeders, weighed purchased quantities in shipments or containers, combination of bulk density and volume measurements, etc.), record the totals for each process input and output for each calendar month, and sum the monthly mass to determine the annual mass for each process input and output. Determine the mass rate of fuels using the procedures for combustion units in §98.34.

(2) Except as provided in paragraph (b)(4) of this section, determine the carbon content of each process input and output annually for use in the applicable equations in §98.173(b)(1) based on analyses provided by the supplier or by the average carbon content determined by collecting and analyzing at least three samples each year using the standard methods specified in paragraphs (b)(2)(i) through (b)(2)(vi) of this section as applicable.

(i) ASTM C25-06, Standard Test Methods for Chemical Analysis of Limestone, Quicklime, and Hydrated Lime (incorporated by reference, see §98.7) for limestone, dolomite, and slag.

(ii) 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) for coal, coke, and other carbonaceous materials.

(iii) ASTM E1915-07a, Standard Test Methods for Analysis of Metal Bearing Ores and Related Materials by Combustion Infrared-Absorption Spectrometry (incorporated by reference, see §98.7) for iron ore, taconite pellets, and other iron-bearing materials.

(iv) ASTM E1019-08, Standard Test Methods for Determination of Carbon, Sulfur, Nitrogen, and Oxygen in Steel, Iron, Nickel, and Cobalt Alloys by Various

Combustion and Fusion Techniques (incorporated by reference, see §98.7) for iron and ferrous scrap.

(v) ASM CS-104 UNS No. G10460 - Alloy Digest April 1985 (Carbon Steel of Medium Carbon Content) (incorporated by reference, see §98.7); ISO/TR 15349-1:1998, Unalloyed steel—Determination of low carbon content, Part 1: Infrared absorption method after combustion in an electric resistance furnace (by peak separation) (1998-10-15) First Edition (incorporated by reference, see §98.7); or ISO/TR 15349-3:1998, Unalloyed steel-Determination of low carbon content Part 3: Infrared absorption method after combustion in an electric resistance furnace (with preheating) (1998-10-15) First Edition (incorporated by reference, see §98.7) as applicable for steel.

(vi) For each process input that is a fuel, determine the carbon content and molecular weight (if applicable) using the applicable methods listed in §98.34.

(3) For solid ferrous materials charged to basic oxygen process furnaces or EAFs that differ in carbon content, you may determine a weighted average carbon content based on the carbon content of each type of ferrous material and the average weight percent of each type that is used. Examples of these different ferrous materials include carbon steel, low carbon steel, stainless steel, high alloy steel, pig iron, iron scrap, and direct reduced iron.

(4) If you document that a specific process input or output contributes less than one percent of the total mass of carbon into or out of the process, you do not have to determine the monthly mass or annual carbon content of that input or output.

(5) Except as provided in paragraph (b)(4) of this section, you must determine the annual carbon content and monthly mass rate of any input or output that contains carbon that is not listed in the equations in §98.173(b)(1) using the procedures in paragraphs (b)(1) and (b)(2) of this section.

(c) If you determine CO<sub>2</sub> emissions using the site-specific emission factor procedure in §98.173(b)(2), you must:

(1) Conduct an annual performance test that is based on representative performance (i.e., performance based on normal operating conditions) of the affected process.

(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. For EAFs that produce both carbon steel and stainless or specialty (low carbon) steel, develop an emission factor for the production of both types of steel.

(3) For taconite indurating furnaces, non-recovery coke batteries, and sinter processes, sample for at least 3 hours.

(4) Conduct the stack test using EPA Method 3A at 40 CFR part 60, appendix A-2 to measure the CO<sub>2</sub> concentration, Method 2, 2A, 2C, 2D, or 2F at 40 CFR part 60, appendix A-1 or Method 26 at 40 CFR part 60, appendix A-2 to determine the stack gas volumetric flow rate, and Method 4 at 40 CFR part 60, at appendix A-3 to determine the moisture content of the stack gas.

(5) Determine the mass rate of process feed or process production (as applicable) during the test using the same plant instruments or procedures that are used for accounting

purposes (such as weigh hoppers, belt weigh feeders, combination of bulk density and volume measurements, etc.)

(6) If your process operates under different conditions as part of normal operations in such a manner that CO<sub>2</sub> emissions change by more than 20 percent (e.g., routine changes in the carbon content of the sinter feed or change in grade of product), you must perform emission testing and develop separate emission factors for these different operating conditions and determine emissions based on the number of hours the process operates and the production or feed rate (as applicable) at each specific different condition.

(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.

(8) The results of a performance test must include the analysis of samples, determination of emissions, and raw data. The performance test report must contain all information and data used to derive the emission factor.

(d) For a coke pushing process, determine the metric tons of coal charged to the coke ovens and record the totals for each pushing process for each calendar month. Coal charged to coke ovens can be measured using weigh belts or a combination of measuring volume and bulk density.

#### **§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.

(a) For each missing data for the carbon content of inputs and outputs for facilities that estimate emissions using the carbon mass balance procedure in §98.173(b)(1) or for facilities that estimate emissions using the site-specific emission factor procedure in §98.173(b)(2); 100 percent data availability is required. You must repeat the test for average carbon contents of inputs and outputs according to the procedures in §98.174(b)(2). Similarly, you must repeat the test to determine the site-specific emission factor if data on the CO<sub>2</sub> emission rate, process production rate or process feed rate are missing.

(b) For missing records of the monthly mass or volume of carbon-containing inputs and outputs using the carbon mass balance procedure in §98.173(b)(1), the substitute data value must be based on the best available estimate of the mass of the input or output material from all available process data or data used for accounting purposes.

#### **§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; and 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.

- (a) Unit identification number and annual CO<sub>2</sub> emissions (in metric tons).
- (b) Annual production quantity (in metric tons) for taconite pellets, coke, sinter, iron, and raw steel.
- (c) If a CEMS is used to measure CO<sub>2</sub> emissions, then you must report the relevant information required under §98.36 for the Tier 4 Calculation Methodology.
- (d) If a CEMS is not used to measure CO<sub>2</sub> emissions, then you must report for each process whether the emissions were determined using the carbon mass balance method in §98.173(b)(1) or the site-specific emission factor method in §98.173(b)(2).
- (e) If you use the carbon mass balance method in §98.173(b)(1) to determine CO<sub>2</sub> emissions, you must report the following information for each process:
  - (1) The carbon content of each process input and output used to determine CO<sub>2</sub> emissions.
  - (2) Whether the carbon content was determined from information from the supplier or by laboratory analysis, and if by laboratory analysis, the method used.
  - (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<sub>2</sub> emissions.
  - (4) The molecular weight of gaseous fuels.
  - (5) If you used the missing data procedures in §98.175(b), you must report how the monthly mass for each process input or output with missing data was determined and the number of months the missing data procedures were used.
- (f) If you used the site-specific emission factor method in §98.173(b)(2) to determine CO<sub>2</sub> emissions, you must report the following information for each process:
  - (1) The measured average hourly CO<sub>2</sub> emission rate during the test (in metric tons per hour).
  - (2) The average hourly feed or production rate (as applicable) during the test (in metric tons per hour).
  - (3) The site-specific emission factor (in metric tons of CO<sub>2</sub> per metric ton of feed or production, as applicable).
  - (4) The annual feed or production rate (as applicable) used to estimate annual CO<sub>2</sub> emissions (in metric tons).
- (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.

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

In addition to the records required by §98.3(g), you must retain the records specified in paragraphs (a) through (e) of this section, as applicable. Facilities that use CEMS to measure emissions must also retain records of the verification data required for the Tier 4 Calculation Methodology in §98.36(e).

- (a) Records of all analyses and calculations conducted, including all information reported as required under §98.176.

(b) When the carbon mass balance method is used to estimate emissions for a process, the monthly mass of each process input and output that are used to determine the annual mass.

(c) Production capacity (in metric tons per year) for the production of taconite pellets, coke, sinter, iron, and raw steel.

(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.

(e) Facilities must keep records that include a detailed explanation of how company records or measurements are used to determine all sources of carbon input and output and the metric tons of coal charged to the coke ovens (e.g., weigh belts, a combination of measuring volume and bulk density). You also must document the procedures used to ensure the accuracy of the measurements of fuel usage including, but not limited to, calibration of weighing equipment, fuel flow meters, coal usage including, but not limited to, calibration of weighing equipment and other measurement devices. The estimated accuracy of measurements made with these devices must also be recorded, and the technical basis for these estimates must be provided.

**§98.178 Definitions.**

All terms used in this subpart have the same meaning given in the Clean Air Act and subpart A of this part.