§ 98.324 Monitoring and QA/QC requirements.

(a) For calendar year 2011 monitoring, the facility may submit a request to the Administrator to use one or more best available monitoring methods as listed in §98.3(d)(1)(i) through (iv). The request must be submitted no later than October 12, 2010 and must contain the information in §98.3(d)(2)(i)(l). To obtain approval, the request must demonstrate to the Administrator’s satisfaction that it is not reasonably feasible to acquire, install, and operate a required piece of monitoring equipment by January 1, 2011. The use of best available monitoring methods will not be approved beyond December 31, 2011.

(b) For \( \text{CH}_4 \) liberated from ventilation systems, determine whether \( \text{CH}_4 \) will be monitored from each ventilation well and shaft, a centralized monitoring point, or a combination of the two options. Operators are allowed flexibility for aggregating emissions from more than one ventilation well or shaft, as long as emissions from all are addressed, and the methodology for calculating total emissions and degasification systems, calculated using Equation FF-6 of this section (metric tons).

\[ \text{CH}_4 \text{ emitted (net)} = \text{CH}_4\text{Total} + \text{CH}_4\text{DTotal} - \text{CH}_4\text{DestroyedTotal} \quad (\text{Eq. FF-7}) \]

Where:
- \( \text{CH}_4 \text{ emitted (net)} \) = Quarterly \( \text{CH}_4 \) emissions from the mine (metric tons).
- \( \text{CH}_4\text{Total} \) = Quarterly sum of the \( \text{CH}_4 \) liberated from all mine ventilation monitoring points (\( \text{CH}_4\text{V} \)), calculated using Equation FF-2 of this section (metric tons).
- \( \text{CH}_4\text{DTotal} \) = Quarterly sum of the \( \text{CH}_4 \) liberated from all mine degasification monitoring points (\( \text{CH}_4\text{D} \)), calculated using Equation FF-4 of this section (metric tons).
- \( \text{CH}_4\text{DestroyedTotal} \) = Quarterly sum of the measured \( \text{CH}_4 \) destroyed from all mine ventilation and degasification systems, calculated using Equation FF-6 of this section (metric tons).

\[ \text{CO}_2 = \frac{\text{CH}_4\text{Destroyedonsite}}{44/16} \quad (\text{Eq. FF-8}) \]

Where:
- \( \text{CO}_2 \) = Total quarterly \( \text{CO}_2 \) emissions from \( \text{CH}_4 \) destruction (metric tons).
- \( \text{CH}_4\text{Destroyedonsite} \) = Quarterly sum of the \( \text{CH}_4 \) destroyed, calculated as the sum of \( \text{CH}_4 \) destroyed for each onsite, non-energy use, as calculated individually in Equation FF-5 of this section (metric tons).
- 44/16 = Ratio of molecular weights of \( \text{CO}_2 \) to \( \text{CH}_4 \).
documented. Monitor by one of the following options:

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

(2) Obtain results of the quarterly (or more frequent) testing performed by MSHA for the methane flowrate. At the same location and within seven days of the MSHA sampling, make measurements of temperature and pressure using the same procedures specified in paragraph (b)(1) of this section. The annual average barometric pressure from the nearest National Oceanic and Atmospheric Administration (NOAA) weather service station may be used as a default for pressure. If the MSHA data for methane flow is provided in the units of actual cubic feet of methane per day, the methane flow data is inserted into Equation FF–1 of this section in place of the value for V and the variables MCF, C/100%, and 1440 are removed from the equation.

(3) Monitor emissions through the use of one or more continuous emission monitoring systems (CEMS). If operators use CEMS as the basis for emissions reporting, they must provide documentation on the process for using data obtained from their CEMS to estimate emissions from their mine ventilation systems.
made each calendar week, there must be at least three days between measurements; and

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

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


(2) As an alternative to the gas chromatography methods provided in paragraph (d)(1) of this section, you may use gaseous organic concentration analyzers and a correction factor to calculate the CH₄ concentration following the requirements in paragraphs (d)(2)(i) through (d)(2)(iii) of this section.

(i) Use Method 25A or 25B at 40 CFR part 60, appendix A–7 to determine gaseous organic concentration as required in § 98.323 and in paragraphs (b) and (c) of this section. You must calibrate the instrument with CH₄ and determine the total gaseous organic concentration as carbon (or as CH₄; K=1 in Equation 25A–1 of Method 25A at 40 CFR part 60, appendix A–7).

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

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

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

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

(iii) Calculate the CH₄ concentration as specified in Equation FF–9 of this section:

\[ C_{CH_4} = f_{NMOC} \times C_{TOOC} \]  

(Eq. FF–9)

Where:

\[ C_{CH_4} \] = Methane (CH₄) concentration in the gas (volume %) for use in Equations FF–1 and FF–3 of this subpart.

\[ f_{NMOC} \] = Correction factor from the most recent determination of the correction factor as specified in paragraph (d)(2)(i) of this section (unitless).

\[ C_{TOOC} \] = Gaseous organic carbon concentration measured using Method 25A or 25B at 40 CFR part 60, appendix A–7 during routine monitoring of the gas (volume %).

(e) All flow meters and gas composition monitors that are used to provide data for the GHG emissions calculations shall be calibrated prior to the first reporting year, using the applicable methods specified in paragraphs (d), and (e)(1) through (e)(7) of this section. Alternatively, calibration procedures specified by the flow meter manufacturer may be used. Flow meters and gas composition monitors shall be recalibrated either at the minimum frequency specified by the manufacturer or annually. The operator shall operate, maintain, and calibrate a gas composition monitor capable of measuring
the concentration of CH₄ in the gas
using one of the methods specified in
paragraph (d) of this section. The oper-
ator shall operate, maintain, and cali-
brate the flow meter using any of the
following test methods or follow the
procedures specified by the flow meter
manufacturer. Flow meters must meet
the accuracy requirements in §98.3(i).

(1) ASME MFC-3M–2004, Measure-
ment of Fluid Flow in Pipes Using Ori-
fice, Nozzle, and Venturi (incorporated
by reference, see §98.7).

(2) ASME MFC–4M–1986 (Reaffirmed
1997), Measurement of Gas Flow by Tur-
bine Meters (incorporated by ref-
erence, see §98.7).

(3) ASME MFC–6M–1998, Measure-
ment of Fluid Flow in Pipes Using Vortex Flowmeters (incorporated by ref-
erence, see §98.7).

(4) ASME MFC–7M–1987 (Reaffirmed
(incorporated by reference, see §98.7).

(5) ASME MFC–11M–2006 Measure-
ment of Fluid Flow by Means of Cor-
iolis Mass Flowmeters (incorporated by ref-
erence, see §98.7).

(6) ASME MFC–14M–2003 Measure-
ment of Fluid Flow Using Small Bore Precision Orifice Meters (incorporated by ref-
erence, see §98.7).

(7) ASME MFC–18M–2001 Measure-
ment of Fluid Flow using Variable Area Meters (incorporated by ref-
erence, see §98.7).

(f) For CH₄ destruction, CH₄ must be
monitored at each onsite destruction
device and each point of offsite trans-
port for combustion using continuous
monitors of gas routed to the device or
point of offsite transport.

(g) All temperature, pressure, and
moisture content monitors must be op-
erated and calibrated using the proce-
dures and frequencies specified by the
manufacturer.

(h) If applicable, the owner or oper-
ator shall document the procedures
used to ensure the accuracy of gas flow
rate, gas composition, temperature,
pressure, and moisture content meas-

urements. These procedures include,
but are not limited to, calibration of
flow meters, and other measurement
devices. The estimated accuracy of
measurements, and the technical basis
for the estimated accuracy shall be re-
corded.

[75 FR 39763, July 12, 2010, as amended at 76
FR 73901, Nov. 29, 2011]

§ 98.325 Procedures for estimating
missing data.

(a) A complete record of all measured
parameters used in the GHG emissions
calculations is required. Therefore,
whenever a quality-assured value of a
required parameter is unavailable (e.g.,
if a meter malfunctions during unit op-
eration or if a required fuel sample is
not taken), a substitute data value for
the missing parameter shall be used in
the calculations, in accordance with
paragraph (b) of this section.

(b) For each missing value of CH₄
concentration, flow rate, temperature,
pressure, and moisture content for ven-
tilation and degasification systems,
the substitute data value shall be the
arithmetic average of the quality-as-
sured values of that parameter imme-
diately preceding and immediately fol-
lowing the missing data incident. If,
for a particular parameter, no quality-
assured data are available prior to the
missing data incident, the substitute
data value shall be the first quality-as-
sured value obtained after the missing
data period.

[75 FR 39763, July 12, 2010, as amended at 76
FR 73903, Nov. 29, 2011]

§ 98.326 Data reporting requirements.
In addition to the information re-
quired by §98.3(c), each annual report
must contain the following informa-
tion for each mine:

(a) Quarterly CH₄ liberated from each
ventilation monitoring point (CH₄vol),
(metric tons CH₄).

(b) Weekly CH₄ liberated from each
degasification system monitoring point
(metric tons CH₄).

(c) Quarterly CH₄ destruction at each
ventilation and degasification system
destruction device or point of offsite
transport (metric tons CH₄).

(d) Quarterly CH₄ emissions (net)
from all ventilation and degasification
systems (metric tons CH₄).

(e) Quarterly CO₂ emissions from on-
site destruction of coal mine gas CH₄,