

**2.12 Sewage Treatment Plants (NSPS Sources)**

2.12.1 Applicability and Designation of Affected Facility

- (a) The affected facility to which the provisions of this source category apply is each incinerator that combusts more than 10 percent sewage sludge (dry basis) produced by municipal sewage treatment plants, or each incinerator that charges more than 1000 kg (2205 lb.) per day municipal sewage sludge (dry basis).
- (b) Any facility under paragraph (a) of this section that commences construction or modification after June 11, 1973 is subject to the requirements of this section.

2.12.2 Test Methods and Procedures

- (a) In conducting the performance tests required in Section 1.2, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of this text or other methods and procedures as specified in this section, except as provided in paragraph 2 of Section 1.2.
- (b) The owner or operator shall determine compliance with the particulate matter emission regulations as follows:

- (1) The emission rate (E) of particulate matter for each run shall be computed using the following equation:

$$E = K(C_s Q_{sd})/S$$

where:

- E = emission rate of particulate matter, g/kg (lb/ton) of dry sludge input.
- C<sub>s</sub> = concentration of particulate matter, g/dscm (g/dscf).
- Q<sub>sd</sub> = volumetric flow rate of effluent gas, dscm/hr (dscf/hr).
- S = charging rate of dry sludge during the run, kg/hr (lb/hr).
- K = conversion factor, 1.0 g/g [4.409 lb<sup>2</sup>/(g-ton)].

- (2) Method 5 shall be used to determine the particulate matter concentration (C<sub>s</sub>) and the volumetric flow rate (Q<sub>sd</sub>) of the effluent gas. The sampling time and sample volume for each run shall be at least 60 minutes and 0.90 dscm (31.8 dscf).

- (3) The dry sludge charging rate (S) for each run shall be computed using either of the following equations:

$$S = K_m S_m R_{dm} / \delta$$

$$S = D_v S_v R_{dv} / \delta$$

where:

- S = charging rate of dry sludge, kg/hr (lb/hr).
- S<sub>m</sub> = total mass of sludge charged, kg (lb).
- R<sub>dm</sub> = average mass of dry sludge per unit mass of sludge charged, mg/mg (lb/lb).
- δ = duration of run, min.
- K<sub>m</sub> = conversion factor, 60 min/hr.
- S<sub>v</sub> = total volume of sludge charged, m<sup>3</sup> (gal).
- R<sub>dv</sub> = average mass of dry sludge per unit volume of sludge charged,

mg/liter (lb/ft<sup>3</sup>).

$K_v$  = conversion factor,  $60 \times 10^{-3}$  (liter·kg·min)/(m<sup>3</sup>·mg·hr)  
 [8.021 (ft<sup>3</sup>·min)/(gal·hr)].

- (4) The flow measuring device of 2.12.3 shall be used to determine the total mass ( $S_m$ ) or volume ( $S_v$ ) of sludge charged to the incinerator during each run. If the flow measuring device is on a time rate basis, readings shall be taken and recorded at 5-minute intervals during the run and the total charge of sludge shall be computed using the following equations, as applicable:

$$S_m = \sum_{i=1}^n Q_{mi} \cdot q_i$$

$$S_v = \sum_{i=1}^n Q_{vi} \cdot q_i$$

where:

$Q_{mi}$  = average mass flow rate calculated by averaging the flow rates at the beginning and end of each interval "i", kg/min (lb/min).

$Q_{vi}$  = average volume flow rate calculated by averaging the flow rates at the beginning and end of each interval "i", m<sup>3</sup>/min (gal/min).

$\theta$  = duration of interval "i", min.

- (5) Samples of the sludge charged to the incinerator shall be collected in nonporous jars at the beginning of each run and at approximately 1-hour intervals thereafter until the test ends, and "209 F. Method for Solid and Semisolid Samples" (incorporated by reference--see Section 1.6) shall be used to determine dry sludge content of each sample (total solids residue), except that:

(i) Evaporating dishes shall be ignited to at least 103°C rather than the 550°C specified in step 3(a)(1).

(ii) Determination of volatile residue, step 3(b) may be deleted.

(iii) The quantity of dry sludge per unit sludge charged shall be determined in terms of mg/liter (lb/ft<sup>3</sup>) or mg/mg (lb/lb).

(iv) The average dry sludge content shall be the arithmetic average of all the samples taken during the run.

- (6) Method 9 and the procedures in Section 1.3 shall be used to determine opacity.

- (d) The owner or operator of any sludge incinerator subject to the provisions of this source category shall conduct a performance test during which the monitoring and recording devices required under 2.12.3 (a)(1), (b)(1), (b)(2), (b)(3), and (b)(4), are installed and operating and for which the sampling and analysis procedures required under 2.12.3 (b)(5) are performed. The owner or operator shall provide the Director at least 30 days prior notice of the performance test to afford the Director the opportunity to have an observer present.

(1) For incinerators that commenced construction or modification on or before April 18, 1986, the performance test shall be conducted within 360 days of the effective date of these regulations unless the monitoring and recording devices required under 2.12.3 (a)(1), (b)(1), (b)(2), (b)(3), and (b)(4) were installed and operating and the sampling and analysis procedures required under 2.12.3 (b)(5) were performed during the most recent performance test and a record of the measurements taken during the performance test is available.

(2) For incinerators that commence construction or modification after April 18, 1986, the

date of the performance test shall be determined by the requirements in Section 1.2.

- (3) For the initial performance test required by paragraph (d) of this section, the three samples collected by Test Method 5 shall be analyzed first for particulate mass and then in one of the following two ways:
  - (i) Two samples shall be analyzed by neutron activation for arsenic, cadmium, chromium, copper, nickel, selenium, and zinc; and one sample shall be analyzed by atomic absorption for beryllium and lead. The sample analyzed for beryllium and lead shall be analyzed according to Method 104 and Method 12, respectively.
  - (ii) Three samples shall be analyzed by atomic absorption for arsenic, beryllium, cadmium, chromium, copper, lead, nickel, selenium, and zinc. The samples shall be analyzed for arsenic, beryllium, and lead according to Method 108, Method 104, and Method 12, respectively. The samples shall be analyzed for cadmium, chromium, copper, nickel, selenium, and zinc according to standard analytical procedures as recommended by atomic absorption equipment manufacturers.
- (4) During the initial performance test required by paragraph (d) of this section, sludge samples shall be collected for the purpose of determining the metals content of the sludge. Samples shall be collected from the sludge charged to the incinerator at the beginning of each run and at approximately 30-minute intervals thereafter until the test run ends. The sludge samples collected during each test run shall be combined into a single composite sample. During the performance test, three composite samples shall be generated. The composite samples shall be analyzed in one of the following two ways:
  - (i) The composite samples shall be analyzed for arsenic, cadmium, chromium, copper, nickel, selenium, and zinc by neutron activation procedures, and for beryllium and lead by atomic absorption according to Method 104 and Method 12, respectively.
  - (ii) The composite samples shall be analyzed by atomic absorption for arsenic, beryllium, cadmium, chromium, copper, lead, nickel, selenium, and zinc. The samples shall be analyzed for arsenic, beryllium, and lead according to Method 108, Method 104, and Method 12, respectively. The samples shall be analyzed for cadmium, chromium, copper, nickel, selenium, and zinc according to standard analytical procedures as recommended by atomic absorption equipment manufacturers.
- (5) The requirements of paragraphs (d)(3) and (d)(4) of this section shall apply only during the first performance test required pursuant to the applicable regulations.

### 2.12.3 Monitoring of Operations

- (a) The owner or operator of any sludge incinerator subject to the provisions of this source category shall:
  - (1) Install, calibrate, maintain, and operate a flow measuring device which can be used to determine either the mass or volume of sludge charged to the incinerator. The flow measuring device shall have an accuracy of  $\pm 5$  percent over its operating range. Except as provided in paragraph (d) of this section, the flow measuring device shall be operated continuously and data recorded during all periods of operation of the incinerator.
  - (2) Provide access to the sludge charged so that a well-mixed representative grab sample of the sludge can be obtained.
  - (3) Install, calibrate, maintain and operate a weighing device for determining the mass of any municipal solid waste charged to the incinerator when sewage and municipal solid waste are incinerated together. The weighing device shall have an accuracy of  $\pm 5$  percent over its operating range.

- (b) The owner or operator of any multiple hearth, fluidized bed, or electric sludge incinerator subject to the provisions of this source category shall comply with the requirements of paragraph (a) of this section and:
- (1) For incinerators equipped with a wet scrubbing device, install, calibrate, maintain and operate a monitoring device that continuously measures and records the pressure drop of the gas flow through the wet scrubbing device. Where a combination of wet scrubbers is used in series, the pressure drop of the gas flow through the combined system shall be continuously monitored. The device used to monitor scrubber pressure drop shall be certified by the manufacturer to be accurate within  $\pm 250$  pascals ( $\pm 1$  inch water gauge) and shall be calibrated on an annual basis in accordance with the manufacturer's instructions.
  - (2) Install, calibrate, maintain and operate a monitoring device that continuously measures and records the oxygen content of the incinerator exhaust gas. The oxygen monitor shall be located upstream of any rabble shaft cooling air inlet into the incinerator exhaust gas stream, fan, ambient air recirculation damper, or any other source of dilution air. The oxygen monitoring device shall be certified by the manufacturer to have a relative accuracy of  $\pm 5$  percent over its operating range and shall be calibrated according to method(s) prescribed by the manufacturer at least once each 24-hour operating period.
  - (3) Install, calibrate, maintain and operate temperature measuring devices at every hearth in multiple hearth furnaces; in the bed and outlet of fluidized bed incinerators; and in the drying, combustion, and cooling zones of electric incinerators. For multiple hearth furnaces, a minimum of one thermocouple shall be installed in each hearth in the cooling and drying zones, and a minimum of two thermocouples shall be installed in the drying zone and one in the cooling zone, and a minimum of two thermocouples shall be installed in the combustion zone. Each temperature measuring device shall be certified by the manufacturer to have an accuracy of  $\pm 5$  percent over its operating range. Except as provided in paragraph (d) of this section, the temperature monitoring devices shall be operated continuously and data recorded during all periods of operation of the incinerator.
  - (4) Install, calibrate, maintain and operate a device for measuring the fuel flow to the incinerator. The flow measuring device shall be certified by the manufacturer to have an accuracy of  $\pm 5$  percent over its operating range. Except as provided in paragraph (d) of the section, the fuel flow measuring device shall be operated continuously and data recorded during all periods of operation of the incinerator.
  - (5) Except as provided in paragraph (d) of this section, collect and analyze a grab sample of the sludge fed to the incinerator once per day. The dry sludge content and the volatile solids content of the sample shall be determined in accordance with the method specified under 2.12.2 (c)(2), except that the determination of volatile solids, step (3)(b) of the method, may not be deleted.
- (c) The owner or operator of any multiple hearth, fluidized bed, or electric sludge incinerator subject to the provisions of this source category shall retain the following information and make it available for inspection by the Director for a minimum of 2 years:
- (1) For incinerators equipped with a wet scrubbing device, a record of the measured pressure drop of the gas flow through the wet scrubbing device, as required by paragraph (b)(1) of this section.
  - (2) A record of the measured oxygen content of the incinerator exhaust gas, as required by paragraph (b)(2) of this section.
  - (3) A record of the rate of sludge charged to the incinerator, the measured temperatures of the incinerator, the fuel flow to the incinerator, and the total solids and volatile solids content of the sludge charged to the incinerator, as required by paragraphs (a)(1), (b)(3), (b)(4), and (b)(5) of this section.

- (d) The owner or operator of any multiple hearth, fluidized bed, or electric sludge incinerator subject to the provisions of this source category from which the particulate matter emission rate measured during the performance test required under 2.12.2 (d) is less than or equal to 0.38 g/kg of dry sludge input (0.75 lb/ton) shall be required to comply with the requirements in paragraphs (a), (b), and (c) of this section during all periods of this incinerator following the performance test except that:
  - (1) Continuous operation of the monitoring devices and data recorders in paragraphs (a)(1), (b)(3), and (b)(4) of this section shall not be required.
  - (2) Daily sampling and analysis of sludge feed in paragraph (b)(5) of this section shall not be required.
  - (3) Recordkeeping specified in paragraph (c)(3) of this section shall not be required.
- (e) The owner or operator of any sludge incinerator other than a multiple hearth, fluidized bed, or electric incinerator of any sludge incinerator equipped with a control device other than a wet scrubber shall submit to the Director for approval a plan for monitoring and recording incinerator and control device operation parameters.