Appendix PT – Performance Testing

PT1. Compliance Demonstration through Performance Test (s): The initial compliance requirements include conducting performance tests according to requirements of this appendix, conducting a fuel analysis for each type of fuel burned in the boiler according to **specific condition C.34** of this permit, establishing operating limits according to specific condition PT 3, and conducting CMS performance evaluations. For unit that burn a single type of fuel, the owner or operator is exempted from the initial compliance requirements of conducting a fuel analysis for each type of fuel burned in the boiler according to **specific condition C.34** of the permit.
[40 CFR 63.7510 (a)]

PT2. Site – Specific Monitoring Plan: If the owner or operator demonstrates compliance with the emission limit (s) through performance testing, he/she shall develop a site-specific monitoring plan according to the requirements in paragraphs (1) through (4) of this condition. This requirement also applies to the owner or operator if he/she petitions the EPA Administrator for alternative monitoring parameters under 40 CFR 63.8(f).

(1) For each continuous monitoring system (CMS) required, the owner or operator shall develop and submit to the Department for approval a site-specific monitoring plan that addresses paragraphs (1)(i) through (iii) of this condition. The owner or operator shall submit this site-specific monitoring plan at least 60 days before the initial performance evaluation of CMS.
   (i) Installation of the CMS sampling probe or other interface at a measurement location relative to each affected process unit such that the measurement is representative of control of the exhaust emissions (*e.g.*, on or downstream of the last control device);
   (ii) Performance and equipment specifications for the sample interface, the pollutant concentration or parametric signal analyzer, and the data collection and reduction systems; and
   (iii) Performance evaluation procedures and acceptance criteria (*e.g.*, calibrations).

(2) In the site-specific monitoring plan, the owner or operator shall also address paragraphs (2)(i) through (iii) of this condition.
   (i) Ongoing operation and maintenance procedures in accordance with the general requirements of 40 CFR 63.8(c)(1), (c)(3), and (c)(4)(ii);
   (ii) Ongoing data quality assurance procedures in accordance with the general requirements of 40 CFR 63.8(d); and
   (iii) Ongoing recordkeeping and reporting procedures in accordance with the general requirements of 40 CFR 63.10(c), (e)(1), and (e)(2)(i).

(3) The owner or operator shall conduct a performance evaluation of each CMS in accordance with the site-specific monitoring plan.

(4) The owner or operator shall operate and maintain the CMS in continuous operation according to the site-specific monitoring plan.

The owner or operator shall monitor and collect data according to this section and the site-specific monitoring plan. [40 CFR 63.7505(d) & 7535 (a)]

PT3. Compliance Demonstration through Performance Testing: If the owner or operator demonstrates compliance through performance testing, he/she shall conduct fuel analyses according to **specific condition C.35. through C.38** of the permit and establish maximum fuel pollutant input levels according to paragraphs (1) through (3) of this condition.

(1) The owner or operator shall establish the maximum chlorine fuel input (Cinput) during the initial performance testing according to the procedures in paragraphs (i) through (iii) as described below.
   (i) The owner or operator shall determine the fuel type or fuel mixture that he/she could burn in the boiler that has the highest content of chlorine.
   (ii) During the performance testing for HCl, the owner or operator shall determine the fraction of the total heat input for each fuel type burned (Qi) based on the fuel mixture that has the highest content of chlorine, and the average chlorine concentration of each fuel type burned (Ci).
   (iii) The owner or operator shall establish a maximum chlorine input level using Equation 5 as shown below.

$$Cl_{input} = \sum_{i=1}^{n}\left[(C_i)(Q_i)\right] \qquad \text{(Eq. 5)}$$

Where:

Cl_{input} = Maximum amount of chlorine entering the boiler or process heater through fuels burned in units of pounds per million Btu.

C_i = Arithmetic average concentration of chlorine in fuel type, i, analyzed according to specific condition 15, in units of pounds per million Btu.

Q_i = Fraction of total heat input from fuel type, i, based on the fuel mixture that has the highest content of chlorine. If the owner or operator does not burn multiple fuel types during the performance testing, it is not necessary to determine the value of this term. Insert a value of ``1'' for Qi.

n = Number of different fuel types burned in the boiler for the mixture that has the highest content of chlorine.

(2) If the owner or operator chooses to comply with the alternative TSM emission limit instead of the particulate matter emission limit, he/she shall establish the maximum TSM fuel input level (TSMinput) during the initial performance testing according to the procedures in paragraphs (i) through (iii) as described below.

(i) The owner or operator shall determine the fuel type or fuel mixture that he/she could burn in the boiler or process heater that has the highest content of TSM.

(ii) During the performance testing for TSM, the owner or operator shall determine the fraction of total heat input from each fuel burned (Qi) based on the fuel mixture that has the highest content of total selected metals, and the average TSM concentration of each fuel type burned (Mi).

(iii) The owner or operator shall establish a baseline TSM input level using Equation 6 as shown below.

$$TSM_{input} = \sum_{i=1}^{n}\left[(M_i)(Q_i)\right] \qquad \text{(Eq. 6)}$$

Where:

TSM_{input} = Maximum amount of TSM entering the boiler or process heater through fuels burned in units of pounds per million Btu.

M_i = Arithmetic average concentration of TSM in fuel type, i, analyzed according to specific condition 15, in units of pounds per million Btu.

Q_i = Fraction of total heat input from based fuel type, i, based on the fuel mixture that has the highest content of TSM. If the owner or operator does not burn multiple fuel types during the performance test, it is not necessary to determine the value of this term. Insert a value of ``1'' for Qi.

n = Number of different fuel types burned in the boiler or process heater for the mixture that has the highest content of TSM.

(3) The owner or operator shall establish the maximum mercury fuel input level (Mercuryinput) during the initial performance testing using the procedures in paragraphs (i) through (iii) as described below.

(i) The owner or operator shall determine the fuel type or fuel mixture that he/she could burn in the boiler or process heater that has the highest content of mercury.

(ii) During the compliance demonstration for mercury, the owner or operator shall determine the fraction of total heat input for each fuel burned (Qi) based on the fuel mixture that has the highest content of mercury, and the average mercury concentration of each fuel type burned (HGi).

(iii) The owner or operator shall establish a maximum mercury input level using Equation 7 as shown below.

$$Mercury_{input} = \sum_{i=1}^{n}\left[(HG_i)(Q_i)\right] \qquad \text{(Eq. 7)}$$

Where:

$Mercury_{input}$ = Maximum amount of mercury entering the boiler or process heater through fuels burned in units of pounds per million Btu.
HG_i = Arithmetic average concentration of mercury in fuel type, i, analyzed according to specific condition 15, in units of pounds per million Btu.
Q_i = Fraction of total heat input from fuel type, i, based on the fuel mixture that has the highest mercury content. If the owner or operator does not burn multiple fuel types during the performance test, it is not necessary to determine the value of this term. Insert a value of ``1'' for Qi.
n = Number of different fuel types burned in the boiler or process heater for the mixture that has the highest content of mercury.
[40 CFR 63.7530(c)]

PT4. Performance Test and Procedures: The owner or operator shall conduct all performance tests according to 40 CFR 63.7(c), (d), (f), and (h). The owner or operator shall also develop a site-specific test plan according to the requirements in 40 CFR 63.7(c) if he/she elects to demonstrate compliance through performance testing. [40 CFR 63.7520(a)]

PT 5. Test Methods: The owner or operator shall conduct the performance test according to the requirements in the table as show below. [40 CFR 63.7520(b)]

To conduct a performance test for the following pollutant	**You must**	**Using**
1. Particulate Matter	a. Select sampling ports location and the number of traverse points.	Method 1 in appendix A to part 60 of this chapter.
	b. Determine velocity and volumetric flow-rate of the stack gas.	Method 2, 2F, or 2G in appendix A to part 60 of this chapter.
	c. Determine oxygen and carbon dioxide concentrations of the stack gas.	Method 3A or 3B in appendix A to part 60 of this chapter, or ASME PTC 19, Part 10 (1981) (IBR, see § 63.14(i)).
	d. Measure the moisture content of the stack gas.	Method 4 in appendix A to part 60 of this chapter.
	e. Measure the particulate matter emission concentration.	Method 5 or 17 (positive pressure fabric filters must use Method 5D) in appendix A to part 60 of this chapter.
	f. Convert emissions concentration to lb per MMBtu emission rates.	Method 19 F-factor methodology in appendix A to part 60 of this chapter.
2. Total selected metals	a. Select sampling ports location and the number of traverse points.	Method 1 in appendix A to part 60 of this chapter.
	b. Determine velocity and volumetric flow-rate of the stack gas.	Method 2, 2F, or 2G in appendix A to part 60 of this chapter.
	c. Determine oxygen and carbon dioxide concentrations of the stack gas.	Method 3A or 3B in appendix A to part 60 of this chapter, or ASME PTC 19, Part 10 (1981) (IBR, see § 63.14(i)).
	d. Measure the moisture content of the stack gas.	Method 4 in appendix A to part 60 of this chapter.
	e. Measure the particulate matter emission concentration.	Method 29 in appendix A to part 60 of this chapter.
	f. Convert emissions	Method 19 F-factor methodology in appendix A to part

	concentration to lb per MMBtu emission rates.	60 of this chapter.
3. Hydrogen chloride	a. Select sampling ports location and the number of traverse points.	Method 1 in appendix A to part 60 of this chapter.
	b. Determine velocity and volumetric flow-rate of the stack gas.	Method 2, 2F, or 2G in appendix A to part 60 of this chapter.
	c. Determine oxygen and carbon dioxide concentrations of the stack gas.	Method 3A or 3B in appendix A to part 60 of this chapter, or ASME PTC 19, Part 10 (1981) (IBR, see § 63.14(i)).
	d. Measure the moisture content of the stack gas.	Method 4 in appendix A to part 60 of this chapter.
	e. Measure the particulate matter emission concentration.	Method 26 or 26A in appendix A to part 60 of this chapter.
	f. Convert emissions concentration to lb per MMBtu emission rates.	Method 19 F-factor methodology in appendix A to part 60 of this chapter.
4. Mercury	a. Select sampling ports location and the number of traverse points	Method 1 in appendix A to part 60 of this chapter.
	b. Determine velocity and volumetric flow-rate of the stack gas.	Method 2, 2F, or 2G in appendix A to part 60 of this chapter.
	c. Determine oxygen and carbon dioxide concentrations of the stack gas.	Method 3A or 3B in appendix A to part 60 of this chapter, or ASME PTC 19, Part 10 (1981) (IBR, see § 62.14(i)).
	d. Measure the moisture content of the stack gas.	Method 4 in appendix A to part 60 of this chapter.
	e. Measure the particulate matter emission concentration.	Method 29 in appendix A to part 60 of this chapter or Method 101A in appendix B to part 61 of this chapter or ASTM Method D6784–02 (IBR, see § 63.14(b)).
	f. Convert emissions concentration to lb per MMBtu emission rates.	Method 19 F-factor methodology in appendix A to part 60 of this chapter.

PT 6. The owner or operator shall not conduct performance tests during periods of startup, shutdown, or malfunction.
[40 CFR 63.7520(e)]

PT 7. The owner or operator shall conduct three separate test runs for each performance test, as specified in 40 CFR 63.7(e)(3). Each test run must last at least 1 hour.
[40 CFR 63.7520(f)]

PT 8. To determine compliance with the emission limits, the owner or operator shall use the F-Factor methodology and equations in sections 12.2 and 12.3 of EPA Method 19 of appendix A to 40 CFR 60 to convert the measured particulate matter concentrations, the measured HCl concentrations, the measured TSM concentrations, and the measured mercury concentrations that result from the initial performance test to pounds per million Btu heat input emission rates using F-factors.
[40 CFR 63.7520(g)]