APPENDIX A

Part 75 Monitoring Requirements for Common Stack and Multiple Stack Configurations

The following Table summarizes the Part 75 continuous monitoring requirements for common stack and multiple stack configurations, under the Acid Rain and CAIR programs. For the RGGI program, the procedures for CO2 mass emission reporting are the same as for Acid Rain sources.

Table A-1: Part 75 Monitoring Requirements for Common Stack and Multiple Stack Configurations

Case No.	If a unit. . . .	Then for this parameter . . .	Install the following monitoring equipment** at these locations . . .
1	Is in the Acid Rain Program and shares a common stack with other affected units in the Program, but no non-affected units	SO_2 (or CO_2) mass emissions [lb/hr (or tons/hr)]	An SO_2 (or CO_2) monitor and a flow monitor on the duct leading from each unit to the common stack; or An SO_2 (or CO_2) monitor and a flow monitor on the common stack and report the combined emissions
		NO_x emission rate (lb/mmBtu)	A NO_x-diluent monitoring system on each duct leading from each unit to the common stack; or A NO_x-diluent monitoring system on the common stack, subject to certain conditions[1]
		Heat input rate (mmBtu/hr)	A flow monitor and a diluent gas monitor on the duct leading from each unit to the common stack; or A flow monitor and a diluent gas monitor on the common stack and apportion the common stack heat input rate to the individual units on the basis of unit load (i.e., electrical or steam load)
		Opacity (%) [if required]	An opacity monitor on each unit, if required by another State or Federal regulation; otherwise An opacity monitor on the common stack.

Case No.	If a unit . . .	Then for this parameter . . .	Install the following monitoring equipment** at these locations . . .
2	Is in the Acid Rain Program and shares a common stack with at least one other unit that is not in the Acid Rain Program	SO_2 (or CO_2) mass emissions [lb/hr (or tons/hr)]	An SO_2 (or CO_2) monitor and a flow monitor on the duct leading from each affected unit to the common stack; or An SO_2 (or CO_2) monitor and a flow monitor on the common stack, subject to certain conditions[2]
		NO_x emission rate (lb/mmBtu)	A NO_x-diluent monitoring system on the duct leading from each affected unit to the common stack; or A NO_x-diluent monitoring system on the common stack and petition the Administrator under §75.66 for approval of a strategy to apportion the common stack emission rate to the individual units
		Heat input rate (mmBtu/hr)	A flow monitor and a diluent gas monitor on the duct leading from each affected unit to the common stack; or A flow monitor and a diluent gas monitor on the common stack, subject to certain conditions[3]
		Opacity (%) [If required]	An opacity monitor on each unit, if required by another State or Federal regulation; otherwise An opacity monitor on the common stack.

Case No.	If a unit . . .	Then for this parameter . . .	Install the following monitoring equipment** at these locations . . .
3	Is in the Acid Rain Program and either: (a) Has multiple exhaust stacks or (b) Has multiple breechings (i.e., ducts) leading to a single stack	SO_2 (or CO_2) mass emissions [lb/hr (or tons/hr)]	An SO_2 (or CO_2) monitor and a flow monitor on each stack or duct and sum the measured mass emissions.
		NO_x emission rate (lb/mmBtu)	A NO_x-diluent monitoring system and a flow monitor on each stack or each duct and determine a Btu-weighted NO_x emission rate for the unit; or If Appendix D is used to measure the unit heat input, install a NO_x-diluent monitoring system on each stack or each duct and report the highest hourly NO_x emission rate recorded by any of these systems as the emission rate for the unit; or If the combustion products are well-mixed, install a NO_x-diluent monitoring system on one stack or duct[4]
		Heat input rate (mmBtu/hr)	A flow monitor and a diluent gas monitor on each stack or duct and sum the measured heat input rates for the unit; or If the unit uses Appendix D methodology, use the measured hourly fuel flow rates and the fuel GCV to quantify the unit heat input rate
		Opacity (%) [If required]	An opacity monitor on each stack or duct

Case No.	If a unit . . .	Then for this parameter . . .	Install the following monitoring equipment** at these locations . . .
4	Is an Acid Rain Program boiler with a main stack-bypass stack exhaust configuration	SO_2 (or CO_2) mass emissions [lb/hr (or tons/hr)]	An SO_2 (or CO_2) monitor and a flow monitor on both the main stack and the bypass stack; or An SO_2 (or CO_2) monitor and a flow monitor only on the main stack and during bypass hours, report the maximum potential SO_2 concentration[5] and the appropriate substitute data values for flow rate and CO_2
		NO_x emission rate (lb/mmBtu)	A NO_x-diluent monitoring system only on the main stack and report the maximum potential NO_x emission rate (MER) during bypass hours[6]; or Follow the procedures for multiple stacks (Case 3(a), above)
		Heat input rate (mmBtu/hr)	A flow monitor and a diluent gas monitor on both the main stack and the bypass stack; or A flow monitor and a diluent gas monitor only on the main stack and report the appropriate substitute data values for flow rate and diluent gas concentration during bypass hours
		Opacity (%) [If required]	An opacity monitor on both the main stack and bypass stack; or An opacity monitor only on the main stack, subject to certain conditions[7]

Case No.	If a unit . . .	Then for this parameter . . .	Install the following monitoring equipment** at these locations . . .
5	Is in the CAIR NO_x Program(s) and shares a common stack with other affected units in the Program(s), but no non-affected units	NO_x mass emissions (lb/hr)	A NO_x-diluent monitoring system and a flow monitor on the duct leading from each unit to the common stack[8]; or A NO_x concentration monitoring system and a flow monitor on the duct leading from each unit to the common stack[9]; or A NO_x-diluent monitoring system and a flow monitor on the common stack[8] and report the combined NO_x mass emissions; or A NO_x concentration monitoring system and a flow monitor on the common stack[9] and report the combined NO_x mass emissions
		Heat input rate (mmBtu/hr)	A flow monitor and a diluent gas monitor on the duct leading from each unit to the common stack; or A flow monitor and a diluent gas monitor on the common stack and apportion the common stack heat input rate to the individual units by load[10]; or If any unit is oil-or gas-fired, Appendix D methodology (i.e., measured fuel flow rates and fuel GCV) may be used to determine its unit heat input rate. If this option is selected, a flow monitor and diluent monitor must be installed in the duct leading to the common stack for the remaining units.

Case No.	If a unit . . .	Then for this parameter . . .	Install the following monitoring equipment** at these locations . . .
6	Is in the CAIR NO_x Program(s) and shares a common stack with at least one non-affected unit	NO_x mass emissions (lb/hr)	A NO_x-diluent monitoring system and a flow monitor[8] on the duct leading from each affected unit to the common stack. Alternatively, if any of the affected units is oil- or gas-fired, for that unit an Appendix D fuel flowmeter may be installed in lieu of the stack flow monitor; or A NO_x concentration monitoring system and a flow monitor[9] on the duct leading from each affected unit to the common stack; or A NO_x-diluent monitoring system and a flow monitor on the common stack, subject to certain conditions[11].
		Heat input rate (mmBtu/hr)	Consistent with the NO_x mass emissions monitoring option used[12], install all necessary flow and diluent gas monitors on the common stack and/or on the ducts leading from the units to the common stack. Alternatively, if any unit is oil-or gas-fired, Appendix D may be used to determine the heat input rate for that unit.
7	Is in the CAIR NO_x Program(s) and has a main stack and bypass stack exhaust configuration	NO_x mass emissions (lb/hr)	A NO_x-diluent monitoring system and a flow monitor on each stack[8]. Alternatively, if the unit is oil- or gas-fired, Appendix D fuel flowmeters may be used in lieu of installing a stack flow monitor; or A NO_x concentration monitoring system and a flow monitor on each stack[9]; or A NO_x-diluent monitoring system and a flow monitor or a NO_x concentration monitoring system and a flow monitor only on the main stack, and report maximum potential values for NO_x and flow rate when the bypass stack is used[6].

Case No.	If a unit . . .	Then for this parameter . . .	Install the following monitoring equipment** at these locations . . .
7 (cont'd)	Is in the CAIR NO_x Program(s) and has a main stack and bypass stack exhaust configuration	Heat input rate (mmBtu/hr)	If both stacks are monitored, install flow and diluent gas monitors on each stack; or If only the main stack is monitored, install flow and diluent gas monitors on the main stack and then, during bypass hours, use standard missing data values for flow rate, and the maximum potential CO_2 (or minimum potential O_2) concentration to calculate heat input rate; or If the unit is oil or gas-fired, use Appendix D to determine the unit heat input rate.
8	Is in the CAIR NO_x Program(s) and either: (a) Has multiple exhaust stacks or (b) Has multiple breechings (i.e., ducts) leading to a single stack	NO_x mass emissions (lb/hr)	A NO_x-diluent monitoring system and a flow monitor on each stack or each duct[8] and sum the measured NO_x mass emissions; or A NO_x concentration monitoring system and a flow monitor on each stack or each duct[9] and sum the measured NO_x mass emissions; or If the unit is oil- or gas-fired, install a NO_x-diluent system on only one stack or duct, subject to certain conditions[13].

Case No.	If a unit . . .	Then for this parameter . . .	Install the following monitoring equipment** at these locations . . .
8 (cont'd)	Is in the CAIR NO_x Program(s) and either: (a) Has multiple exhaust stacks or (b) Has multiple breechings (i.e., ducts) leading to a single stack	Heat input rate (mmBtu/hr)	A flow monitor and diluent gas monitor on each stack or duct and sum the measured heat input rates; or If the unit is oil- or gas-fired and meets certain criteria[13], use Appendix D to determine the unit heat input rate.
9	Is in the CAIR SO_2 Program and shares a common stack with other affected units in the Program, but no non-affected units	SO_2 mass emissions (lb/hr)	Follow the guidelines for SO_2 mass emissions in Case 1, above
		Heat input rate (mmBtu/hr)	Follow the guidelines in Case 1, above
10	Is in the CAIR SO_2 Program and shares a common stack with at least one other unit that is not in the Program	SO_2 mass emissions (lb/hr)	Follow the guidelines for SO_2 mass emissions in Case 2, above
		Heat input rate (mmBtu/hr)	Follow the guidelines in Case 2, above
11	Is in the CAIR SO_2 Program and either: (a) Has multiple exhaust stacks or (b) Has multiple breechings (i.e., ducts) leading to a single stack, and the owner or operator elects to monitor in the ducts	SO_2 mass emissions (lb/hr)	Follow the guidelines for SO_2 mass emissions in Case 3, above
		Heat input rate (mmBtu/hr)	Follow the guidelines in Case 3, above

Notes----Table A-1

** Although not shown in Cases 1 through 11 in Table A-1, in some instances, installation of a continuous moisture monitoring system will also be required. As described in Table 7 in Section 3.4 of this guide, a correction for stack gas moisture is sometimes required to accurately determine the emissions or heat input rate. When a correction for moisture is needed, the owner or operator must either use an approved default moisture value or install a continuous moisture monitoring system.

[1] The compliance options available to the owner or operator depend on: (a) which (if any) of the units has a Part 76 NO_x emission limit; and (b) the magnitude(s) of any such limit(s).

[2] Compliance options include: (a) opting the non-affected units into the Program; (b) attributing all measured emissions to the affected units; (c) monitoring the non-affected units and using a subtractive methodology; and (d) petitioning EPA for approval of an emission apportionment strategy. The owner or operator must ensure that SO_2 or CO_2 mass emissions from the affected unit(s) are not underestimated.

[3] The owner or operator has the same basic compliance options for heat input rate as for SO_2 and CO_2 mass emissions accounting (see preceding footnote). Once the combined heat input rate of the affected units has been quantified, it must be apportioned to the individual affected units, either on the basis of load or according to a strategy that has been approved by petition under §75.66.

[4] This option may only be used if the monitored stack or duct cannot be bypassed (e.g., with a damper). The option is also disallowed if the monitored NO_x emission rate is not representative of the emissions discharged to the atmosphere (e.g., if there are additional NO_x emission controls downstream of the monitored location).

[5] Coal-fired Acid Rain Program units with this configuration have flue gas desulfurization systems (scrubbers) that reduce SO_2 emissions substantially (90% or more, in most cases). Therefore, during scrubber bypass hours, reporting the maximum potential SO_2 concentration (or, if available, data from a certified SO_2 monitor at the control device inlet) is appropriate.

[6] If the flue gases are routed through an SCR upstream of the bypass stack, you may report the maximum controlled NO_x emission rate (MCR) in lieu of the MER, provided that the SCR unit is documented to be working properly during the bypass.

[7] An opacity monitor is not required on the bypass stack if: (a) a Federal, State, or local regulation exempts the bypass stack from opacity monitoring; or (b) an opacity monitor is already installed at the inlet of the add-on emission controls; or (3) if visible emissions observations are made using EPA Method 9 during bypass events.

[8] These monitoring systems are required if NO_x mass is calculated by multiplying the NO_x emission rate (lb/mmBtu) by the heat input rate (mmBtu/hr).

[9] These monitoring systems are required of NO_x mass is calculated as the product of NO_x concentration (ppm), stack gas flow rate (scfh), and a conversion factor.

[10] To use this option, all units using the common stack must have the same F-factor.

[11] Available compliance options include: (a) opting the non-affected units into the Program and reporting the combined NO_x mass emissions; (b) attributing all of the NO_x mass emissions measured at the common stack to the affected units; (c) installing a NO_x -diluent monitoring system and a flow monitor on the duct leading from each non-affected unit to the common stack, and petitioning to use a subtractive methodology; or (d) petitioning for approval of a method of apportioning the NO_x mass emissions measured at the common stack to the individual units.

[12] Depending on the compliance option used, heat input rate determinations may be necessary at the common stack, in the ductwork to the affected units, in the ductwork of the non-affected units, or some combination of these.

[13] The conditions are: (a) Appendix D must be used to determine the heat input rate; (b) the combustion products must be well-mixed; (c) it must be impossible to bypass the monitored stack or duct (e.g., with dampers); and (d) there must be no NO_x emission controls downstream of the monitored location.