



# FORM CE3: CONTROL EQUIPMENT INFORMATION FOR WET OR DRY SCRUBBERS

Please see instructions on reverse side.

Company Name: \_\_\_\_\_

**CONTROL EQUIPMENT DESCRIPTION**

1. Type of Control Equipment:  Packed Bed  Spray Chamber  Venturi  Dry  Other \_\_\_\_\_
2. Control Equipment (CE) ID: \_\_\_\_\_
3. Emission Point (EP) ID: \_\_\_\_\_
4. Manufacturer: \_\_\_\_\_
5. Model: \_\_\_\_\_
6. Date of On-Site Installation: \_\_\_\_\_ 7. Date of Modification: \_\_\_\_\_
8. Is a Capture Hood Involved:  Yes  No 9. If yes, Capture Hood Efficiency (percentage): \_\_\_\_\_

**CONTROL EQUIPMENT PERFORMANCE MONITORING**

10. Describe how your facility will monitor the performance of this control equipment:
 

<input type="checkbox"/> Total Liquor Flow Rate	<input type="checkbox"/> Recycled Liquor Flow Rate
<input type="checkbox"/> Pressure Drop	<input type="checkbox"/> Control Equipment Inspections and Maintenance
<input type="checkbox"/> Visible Emissions (Observation)	<input type="checkbox"/> Inlet Liquor Temperature
<input type="checkbox"/> Other _____	
11. Describe the range and monitoring frequency of your control device monitoring choice(s):

12. Type of Additive Used (if any): \_\_\_\_\_
13. Additive Feed Rate: \_\_\_\_\_  
(indicate gallons per minute or pounds per minute)

**DETAILED CONTROL EQUIPMENT SPECIFICATIONS**

14. Manufacturer's Data and Engineering Specifications Enclosed:  Yes  No
15. Design Data for the Applicable Type of Scrubber:
 

<input type="checkbox"/> Total Liquor Flow Rate: _____	(minimum gallons per minute)
<input type="checkbox"/> Recycled Liquor Flow Rate: _____	(minimum gallons per minute)
<input type="checkbox"/> Maximum Inlet Liquor Temperature: _____	(degrees Fahrenheit)
<input type="checkbox"/> Normal Liquor pH: _____	(allowable range)
<input type="checkbox"/> Pressure Drop: _____	(allowable range)
<input type="checkbox"/> Other: _____	

16. Pollutant Control Efficiency	PM	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	VOC	Other( )

## Instructions for Form CE3: Control Equipment Information for Wet or Dry Scrubbers

- If you have multiple pieces of control equipment that vent from one emission point, attach the appropriate form for each piece of control equipment.
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### Understanding CE3 Form Information: Each number provides an explanation for the corresponding field on the form.

**Company Name:** This is useful if application pages become separated.

#### Control Equipment Description

1. **Type of Control Equipment:** Check the appropriate box for the type of scrubber.
2. **Control Equipment (CE) ID:** Called the control equipment (CE) identification (ID). It can be any combination of letters or numbers up to 16 characters in length. The ID should match the ID for this control equipment used on previous construction permit applications and within this application. If also submitting an operating permit application, the ID used in this application should be consistent with those used in the operating permit application.
3. **Emission Point (EP) ID:** Called the emission point (EP) identification (ID). It can be any combination of letters or numbers up to 16 characters in length. The ID should match the ID for this equipment used on other construction permit applications and within this application. If also submitting an operating permit application, the ID used in this application should be consistent with those used in the operating permit application.
4. **Manufacturer:** Provide the manufacturer of the control equipment (if known).
5. **Model:** Provide the model number of the control equipment (if known). If custom, provide engineering specifications as required in #15-#16.
6. **Date of On-Site Installation:** Provide the date when on-site installation of the control equipment began or will begin, including the month and year.
7. **Date of Modification:** Provide the month and year of the last modification. In the case of a proposed modification, provide the best estimate of the modification date.
  - For the purpose of this form, **Modification** means any physical change, or change in method of operation of any existing equipment or control equipment.
8. **Capture Hood:** Indicate whether there is a capture hood associated with the emission unit and control device. A **Capture Hood** catches air pollution at the emission unit and directs to the control device. It is used when the control equipment is not in a closed system with the emission unit.
9. **Capture Hood Efficiency:** If there is a capture hood, list the capture efficiency, if known. The capture hood efficiency can be obtained from the hood manufacturer or vendor.

#### Performance Monitoring

10. **Monitoring Control Equipment:** Describe how your facility will monitor the performance of this control equipment. Additional monitoring may be required by the DNR to ensure compliance with requested permit limits. Examples of control equipment monitoring include measuring the minimum liquor (i.e., scrubbing liquid) flow rate; measuring the maximum recycle rate; measuring the pressure drop across the scrubber; monitoring the pH range; monitoring the liquor temperature.
11. **Range and Monitoring Frequency:** Describe the range (e.g., pressure drop, scrubber flow rate, recycle rate, pH, etc.) and the frequency of each monitoring choice for this control device that was listed in #10. The range should provide for the normal operating range of the equipment and can be obtained from the manufacturer and vendor. The range could also be determined from stack testing. The applicant should provide an estimate of the frequency of parameter monitoring that they feel is reasonable.

Frequency can be as often as continuously or can be as little as annually depending on the type of equipment, the monitoring parameter chosen, and the importance of the control equipment to meet the emissions limits requested in the permit.

12. **Type of Additive Used:** If any additive is used in the scrubber liquor to improve pollutant control, provide the type(s) of additive here. Include manufacturer's documentation if available as a separate attachment labeled "CE3-12A".
13. **Additive Feed Rate:** If any additive is used, provide the feed rate(s) in either gallons per minute for liquid additives or pounds per minute for solid additives. Please indicate whether the feed rate provided is in gallons or pounds per minute.

#### **Detailed Control Equipment Specifications**

14. **Manufacturer's Data and Engineering Specifications:** Indicate whether supporting documentation, such as manufacturer's data or engineering specifications, is attached. The manufacturer's data should provide a general description of the control equipment and specific design specifications that would answer the remaining questions in this section of the form. If yes, attach as a separate sheet labeled "Form CE3-14A". If supporting documentation is not attached, the department may request specific design and operational specifications for the equipment.
15. **Design Data for the Applicable Type of Scrubber:** In addition to the specific questions asked concerning flow rate, pH, and pressure drop the applicant must also provide the design data used for the specific type of scrubber. This can involve throat velocity for a venture scrubber, type of packed bed material and size of packing material for a packed bed scrubber, air-to-volume ratio, etc. Attach this information as a separate sheet labeled "CE3-15A".
16. **Pollutant Control Efficiency:** For each pollutant controlled, indicate the overall efficiency of the control device, as designed. Include supporting documentation for the control efficiency of the control equipment. Attach this information as a separate sheet labeled "CE3-16A".