

INSTRUCTIONS:

Section 4.4: Compliance Assurance Monitoring (CAM) Applicability

IMPORTANT: Please type or print with black ink. Do NOT use pencil. If you have questions, please contact the Nebraska Department of Water, Energy, and Environment (DWEE), Air Quality Operating Permit Section, at (402) 471-2186 or .

GENERAL INSTRUCTIONS

NDWEE strongly suggests reading these instructions prior to completing Section 4.4.1 and having these instructions available while completing Section 4.4.1.

An introduction to CAM is available in a fact sheet on the DWEE website.

After reading the CAM Applicability instructions, complete Section 4.4.1, CAM.

This section should only be submitted to DWEE if you are requesting a Class I Operating Permit.

CAM APPLICABILITY

On October 22, 1997, EPA promulgated Compliance Assurance Monitoring (CAM) rules as codified in 40 CFR Part 64. [Federal Register, Vol. 62, No. 204, Wednesday, October 22, 1997; Rules and Regulations, Pages 54900 through 54947]. The CAM approach is intended to address the requirement in Title VII of the 1990 Clean Air Act Amendments that EPA promulgate enhanced monitoring and compliance certification requirements for major sources and the related requirement in Title V that operating permits include monitoring, compliance certification, reporting and recordkeeping provisions to assure compliance. The CAM approach establishes monitoring for the purpose of: (1) documenting continued operation of the control measures within ranges of specified indicators of performance (such as emission, control device parameters, and process parameters) that are designed to provide a reasonable assurance of compliance with applicable requirements; (2) indicating any excursions from these ranges; and (3) responding to the data so that excursions are corrected.

Table 1: CAM Requirements – This checklist should be completed for each Emission Unit identified in Table 1 of Section 2.1 using the following instructions:

Step 1) Is the emission unit subject to an emission limitation(s)? This includes both unit specific limitations and source-wide limitations.

Yes If **YES**, proceed to Step 2.

No If **NO**, CAM does not apply to this emissions unit.

Step 2) For each limitation identified in Step 1, is a control device, as defined in 40 CFR 64.1, used to achieve compliance?

Yes If **YES**, list the Emission Unit ID {Column (1)}, the Emission Unit Description {Column (2)}, the Emissions Limitation {Column (3)}, the Basis for Each Emission Limitation {Column (4)}, and the Pollutant subject to the Limitation {Column (5)} in Table 1: CAM Requirements. If an emission unit is subject to multiple limitations for a single pollutant, list each individual limitation and the basis for each limitation. For example, an emission unit may have limitations from both an NSPS and a Prevention of Significant Deterioration (PSD) Best Available Control Technology (BACT) determination for a single pollutant. In this case, you must list both the NSPS and the

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PSD BACT limit and provide the basis for each limitation. Proceed to Step 3.

- No The emission unit or limitation is not subject to CAM

Step 3) Is this the initial operating permit application for the emissions unit, or a renewal application?

- INITIAL If **INITIAL**, proceed to Step 4.

- RENEWAL If **RENEWAL**, proceed to Step 5.

Step 4) For each pollutant listed in Column (4) of Table 1, are the potential post-control emissions of the pollutant equal to or greater than 100% of the amount, in tons per year, required for a source to be classified as a major source?

- YES If **YES**, proceed to Step 6.

- NO If **NO**, CAM is not required for this unit for the emission limitation identified at this time, but will be required at renewal. Indicate that CAM is not required in column (6) and note that this is an initial operating permit application and the unit is an “other pollutant specific emission unit” in column (7). Also, please attach emissions calculations to Section 4.4.1.

Step 5) For each pollutant listed in Column (4) of Table 1, are the potential pre-control emissions of the pollutant equal to or greater than 100% of the amount, in tons per year, required for a source to be classified as a major source for at least one regulated pollutant?

- YES If **YES**, proceed to Step 6

- NO If **NO**, CAM does not apply to this unit for the emission limitation(s) identified. Indicate that CAM is not required in column (6) and note that potential pre-control emissions do not exceed the major source threshold in column (7). Also, please attach emissions calculations to Section 4.4.1.

Step 6) Is the emission unit in question a backup utility power emission unit that is municipally owned and that meets the following criteria? **NOTE: The owner or operator must provide documentation in the permit application that demonstrates the emissions unit meets these criteria.**

- The utility unit is exempt from all monitoring requirements in 40 CFR Part 75 (including the appendices thereto);
- The utility unit is operated for the sole purpose of providing electricity during periods of peak electrical demand or emergency situations and will be operated consistent with that purpose throughout the part 70 or 71 permit term. You must provide historical operating data and relevant contractual obligations to document that this criterion is satisfied; and
- The actual emissions from the utility unit, based on the average annual emissions over the last three calendar years of operation (or such shorter time period that is available for units with fewer than three years of operation) are less than 50% of the

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amount in tons per year required for a source to be classified as a major source and are expected to remain so.

- YES If **YES**, CAM is not required for this emission unit. Indicate that CAM is not required in column (6). In column (7) indicate that CAM is not required because the unit is a backup utility power emissions unit that satisfies the items of 40 CFR 64.2(b)(2).
- NO If **NO**, proceed to Step 7.

Step 7) For each emission limitation listed in Column (3) of Table 1, is the basis for the emissions limitation a New Source Performance Standard (NSPS) or National Emission Standard for Hazardous Air Pollutants (NESHAP) that was proposed after November 15, 1990?

- YES If **YES**, CAM is not required for this emissions limitation. Indicate that CAM is not required in column (6). In column (7) indicate that CAM is not required because CAM requirements are satisfied by an NSPS or NESHAP limitation that was proposed and established after 11/15/1990. Please identify the subpart that the unit is subject to and proposal date if known.
- NO If **NO**, proceed to Step 8.

Step 8) For each emission limitation listed in Column (3) of Table 1, is the basis for the emissions limitation either the Stratospheric Ozone Protection requirements under Title VI of the Clean Air Act (the Act) or the Acid Rain Program requirements pursuant to Sections 404, 405, 406, 407(a), 407(b), or 410 of the Clean Air Act?

- YES If **YES**, CAM is not required for this emissions limitation. Indicate that CAM is not required in column (6). In column (7), indicate that CAM is not required because CAM requirements are satisfied by the emissions limitation established by the Stratospheric Ozone Protection requirements under Title VI of the Clean Air Act or the Acid Rain Program requirements pursuant to Sections 404, 405, 406, 407(a), 407(b), or 410.
- NO If **NO**, proceed to Step 9.

Step 9) For each emission limitation listed in Column (3) of Table 1, is the basis for the emissions limitation an emissions trading program approved or promulgated under the Act that allows for trading emissions within a source or between sources?

- YES If **YES**, CAM is not required for this emissions limitation. Indicate that CAM is not required in Column (6). In column (7), indicate CAM is not required because CAM is satisfied by the emissions limitation that was established by a national cap and trade program.
- NO If **NO**, proceed to Step 10.

Step 10) For each emission limitation listed in Column (3) of table 1, is the basis for this emissions limitation the result of this unit being subject to an emissions cap that meets the requirements specified in 40 CFR 70.4(b)(12) or 40 CFR 71.6(a)(13)(iii)?

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- YES If **YES**, CAM is not required for this emissions limitation. Indicate that CAM is not required in Column (6). In column (7) , indicate that CAM is not required because CAM is satisfied through the emissions limitation by an emissions cap that meets the requirements specified in either 40 CFR 70.4(b)(12) or 40 CFR 71.6(a)(13)(iii).
- NO If **NO**, proceed to Step 11.

Step 11) Does the basis for the emissions limitation or standard identified in Column (3) of Table 1 specify a continuous compliance determination method established in a 40 CFR Part 70 or 71 permit, as defined in 40 CFR 64.1, and the applicable compliance method does not include an assumed control device emission reduction factor that could be affected by the actual operation and maintenance of the control device (such as a surface coating line controlled by a thermal oxidizer for which continuous compliance is determined by calculating emissions on the basis of coating records and an assumed control device efficiency factor based on an initial performance test; in this example you would select “NO” below. CAM would be required for the control device and capture system but is not applicable to the remaining elements of the coating line, such as raw material usage)?

- YES If **YES**, CAM is not required for this emissions limitation. Indicate that CAM is not required in column (6). In column (7) indicate that CAM is not required because CAM is satisfied through the emissions limitation established by a 40 CFR Part 70 or 71 permit which specifies a continuous compliance determination method, as defined in 40 CFR 64.1 and the applicable compliance method does not include an assumed control device emission reduction factor that could be affected by the actual operation and maintenance of the control device.
- NO If **NO**, CAM applies to this emission unit for the emissions limitation(s) identified in Table 1. Indicate that CAM applies in Column (5).

CAM PLAN INFORMATION

For each emission unit subject to CAM, you must develop a CAM plan. A CAM plan identifies indicators of control device performance, corrective action trigger levels, monitoring equipment, monitoring performance criteria, data collection criteria, and implementation processes and schedules, if necessary, for the appropriate pollutant(s) and emission units. Depending on the emission unit, applicable requirement, and control equipment, there are several monitoring approaches that will satisfy CAM. These include actual emissions monitoring, predictive emissions monitoring systems, visible emissions monitoring, control device parameter monitoring, process monitoring, inspection and maintenance activities, or a combination thereof. You will have to decide which is most appropriate for your situation. In many cases, the current permit may already include CAM-like monitoring requirements. In those cases, you are encouraged to use the same approach for developing the CAM plan.

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EPA has also developed a CAM guidance document that includes examples of CAM for different types of emission units and control devices. [EPA CAM assistance documents can be found at <https://www.epa.gov/air-emissions-monitoring-knowledge-base/compliance-assurance-monitoring>]

Once a CAM plan is approved, elements of the plan will become Operating Permit conditions. If, at a later time, DWEE determines that you have not adequately responded to a parameter range excursion or emissions exceedance, DWEE may require that a Quality Improvement Plan (QIP) be developed and implemented within a reasonable time period.

Table 2: CAM Plan must be completed for each pollutant where CAM is required. If multiple emission units are subject to CAM for the same pollutant, a separate Table 2: CAM Plan must be completed for each emission unit. For example, if two emission units (EU1 and EU2) are both subject to CAM for a NO_x limitation, one Table 2: CAM Plan must be completed for NO_x from EU1 and a second Table 2: CAM Plan must be completed for NO_x from EU2. If a single emission unit is subject to CAM for the same pollutant multiple times because of multiple emission limitations in different regulations, only one Table 2: CAM Plan must be completed. However, the CAM plan must demonstrate compliance with all limitations. There is space in Table 2: CAM Plan to include two different limitations for the same pollutant that exist on an emissions unit where CAM is applicable. If more than two limitations exist for a single pollutant, please use additional pages of Table 2: CAM Plan to account for all limitations.

In section (1) of Table 2: CAM Plan, enter the Emission Unit ID number for the emission unit being discussed. Use the same Emission Unit ID number that is used in section (1) of Table 1: CAM Requirements. In section (2), enter the emission unit description for the emission unit that corresponds to the emission unit ID number in section (1). Section (2) will be the same description that is in section (2) of Table 1: CAM Requirements. In section (3), titled “Basis for the Emissions Limitation,” enter the applicable requirement that set the emission limitation. The regulated pollutant should be identified in section (4), which is titled “Pollutant.” In section (5), identify the specific emissions limitation, including units and averaging period, that is applicable to the emission unit identified (example: 0.1 lb/MMBtu, 30-day rolling average). There is space on the form to include two different applicable requirements and associated emission limitations. If the emissions unit has more than two applicable requirements and/or emission limitations for the specified pollutant, use multiple pages of Table 2: CAM Plan so that all applicable requirements and associated emission limitations are identified.

In section (6) of Table 2: CAM Plan, enter the Control Equipment ID number of the piece of control equipment used to control the emissions of the pollutant identified from the emission unit. Every piece of control equipment located at the source should be identified by its own unique identification number. In section (7), enter a description of the control equipment.

For section (8) of Table 2: CAM Plan, state which indicators of control device performance are to be used in the CAM plan. More than one indicator may be used. Below is a discussion of each option, but you are encouraged to review EPA’s guidance for examples of acceptable indicators of performance. EPA has also developed a CAM guidance document that includes examples of CAM for different types of emissions units and control devices.

Actual emissions: If a continuous emissions monitoring system (CEMS) is already required by another regulation, you are required to use it as the monitoring method to satisfy the CAM requirements. For example, 40 CFR Part 60, Subpart D requires continuous monitoring of sulfur dioxide. If the emissions unit is subject to Subpart D, the CEMS must also be used for CAM to avoid creating additional control device monitoring requirements.

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Predicted emissions: A second option is the use of existing predictive emissions monitoring systems (PEMS) or you may choose to develop a PEMS to satisfy the CAM requirements. This approach typically provides information on the process operations and the control device operating parameters in addition to the stack emissions. In some cases, this type of monitoring could potentially allow you to optimize production efficiency while preventing excess emissions. And, like a CEMS, a PEMS also provides a record for verifying actual compliance with the emission limit.

Process parameters: Although the CAM rule is applicable only to those units with control equipment, it may be necessary to monitor process parameters such as total throughput to stay within the rated capacity for a control device. An example of this is residual oxygen for a boiler with a multiclone control device. In this case, the multiclone is rated to remove a percentage of the particulate emissions entering the unit and ensure compliance during “normal” operations. However, if there is a boiler upset, as indicated by abnormal oxygen readings in the boiler exhaust gases, the particulate matter loading may overwhelm the multiclone and excess emissions could occur. Therefore, in this situation, it would be appropriate to monitor both the process parameter (boiler residual oxygen) and the control equipment (multiclone).

Control device parameters: The CAM rule is designed primarily to monitor the performance of control equipment with the presumption that proper operation of the control equipment will ensure compliance with the emission limitation. Therefore, most CAM plans will include monitoring of one or more control device parameters such as pressure drop, temperature, water flow, or voltage, depending on the control technology. Opacity may also be used as a performance parameter for control devices used to meet particulate matter emissions limits, especially if a continuous opacity monitoring system (COMS) is already required. If opacity is used, you will have to identify the appropriate action level as with any other parameter. In many cases, the action level may be less than the visual emissions limit (less than 20 percent opacity), but the averaging time could be different than that specified for the visual emissions limit.

Inspection and maintenance activities: In some cases, the performance of a control device does not vary. In these cases, frequent monitoring of a control device parameter is not necessary. Instead, a routine inspection and maintenance program may be appropriate. For example, it may be more appropriate to inspect the physical characteristics of a multiclone once a year instead of routinely monitoring the pressure drop, which could vary more due to fluctuations in gas flow rates rather than actual performance. However, because it is only possible to perform inspections when the unit is not operating and it is possible that the multiclone could break (lose a cyclone), it may be appropriate to combine the inspection and maintenance program with a continuous or periodic visible emission monitoring program.

CAM Plan Contents: As noted, for each emission unit affected by CAM, you must develop and submit a CAM plan. You must complete a CAM Plan on a separate sheet(s) of paper and attach it to Form 4.0, Section 4.4.1. The plan must include, but is not limited to, the following information:

- 1) If process parameter(s), control device parameter(s), and/or inspection and maintenance activities will be utilized as indicators of control equipment performance, describe the types of parameters and/or inspection and maintenance activities that you will use.
- 2) The indicator range(s) or operating conditions that will be used to determine that the control device is operating properly and being properly maintained. Once these ranges or operating conditions are established, you will be required to take corrective action anytime there is an indicator range or operating condition excursion or exceedance. The indicator ranges or designated conditions may be:

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- a. a single maximum or minimum value (e.g., maintaining condenser temperatures at a certain number of degrees below the condensation temperature of the applicable compound(s) being processed) or multiple levels that are relevant to distinctly different operating conditions (e.g., high versus low load levels)
 - b. expressed as a function of process variables (e.g., an indicator range expressed as minimum to maximum pressure drop across a venturi throat in a particulate scrubber)
 - c. expressed as maintaining the applicable parameter in a particular operational status or designated condition (e.g., position of a damper controlling gas flow through a bypass duct to the atmosphere).
 - d. established as independent for more than one indicator.
- 3) The basis for the indicator ranges or operating conditions. This could be a source test, manufacturer's design criteria, engineering assessment, statistical analysis or existing data, or some other basis. If the indicator ranges or operating conditions are based on a source test, verify that the emissions unit and/or control device have not been altered since the test in such a manner as to make the values measured during the test unrepresentative of current operations.
- 4) For each monitoring device that will be used for compliance assurance monitoring (e.g., continuous emissions monitors, temperature sensors, pressure gauges, etc.), provide the following information:
- a. Identify the monitoring device.
 - b. Describe the location and installation specifications of the monitoring device that allow for obtaining data which are representative of the emissions or parameters being monitored. For non-instrumental monitoring approaches, such as an inspection and maintenance program, this information will not be applicable.
 - c. For other monitoring approaches that include actual monitoring equipment, the location of the monitoring equipment or sensor can be shown on a diagram of the emissions unit and control equipment, which is then attached to the CAM Plan. Where a diagram is not feasible, provide a narrative description of the monitoring device location. Also describe any other installation specifications, such as initial calibrations that may have been or will be performed as a result of other applicable requirements (e.g., 40 CFR 60.13) or the manufacturer's recommendations. Describe the procedure by which you will verify the operational status of any new or modified monitoring equipment. You must, at a minimum, consider the manufacturer's requirements or recommendations for installation, calibration, and start-up of the equipment. When monitoring is required by another requirement, such as an NSPS, you must also meet those requirements.
 - d. Describe any quality assurance and control practices that are necessary to ensure the continuing validity of the data. For continuous emissions or opacity monitoring systems or predictive emissions monitoring systems, you should review the QA/QC requirements in 40 CFR 60.13. For other types of monitoring, ongoing quality control measures must be adequate to ensure that the monitoring system remains operational and can provide readings suitable for the purpose of measuring changes in control performance that indicate possible exceptions to compliance. At a minimum, you should consider the manufacturer's requirements or recommendations for developing quality assurance practices.
 - e. Describe the data collection system, including the method (e.g., strip chart, data logger, computer, manual log, etc.), frequency, and averaging period. The CAM rule requires that the monitoring

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frequency (including associated averaging periods) be designed to obtain data at such intervals that are, at a minimum, commensurate with the time period over which an excursion from an indicator range is likely to be observed based on the characteristics and typical variability of the pollutant-specific emissions unit (including the control device and associated capture system). For emissions units with the potential to emit more than 100 tons per year of the regulated pollutant, the data collection frequency shall be at least four or more data values equally spaced over each hour of operation; unless you can demonstrate that less frequent data collection is warranted. For emissions units with the potential to emit less than 100 tons per day of the regulated pollutant, the minimum data collection frequency shall be once per day. Many types of control devices are subject to rapid changes in performance and thus the frequency design criterion could result in frequent, near continuous collection of parametric data that are subsequently averaged over an appropriate period of time (often consistent with the required minimum time for conducting a compliance test). As mentioned above, EPA has developed guidance for compliance assurance monitoring, including example monitoring approaches. The guidance will indicate how the frequency of monitoring, data collection procedures, and averaging of data points can vary based on the type of emissions unit and the control device involved.

- 5) Provide a justification for the proposed monitoring approach. The justification can rely on any available information, including appropriate reference materials and guidance documents. If an existing requirement already establishes monitoring for the emission unit, the justification can rely in part on the existing requirement. For the types of monitoring specified below, no extensive justification should be necessary because the CAM rule creates a rebuttable presumption that the monitoring satisfies the requirements. When you rely on one of the following monitoring approaches, all that initially should be necessary is an explanation of why the monitoring is applicable to the unit in question:
 - a. presumptively acceptable or required monitoring approaches, established by the permitting authority in a rule that constitutes part of the applicable implementation plan required pursuant to Title I of the Act, that are designed to achieve compliance with this part for particular pollutant-specific emissions units;
 - b. continuous emission, opacity or predictive emission monitoring systems that satisfy applicable monitoring requirements and performance specifications of 40 CFR 51.214 and appendix P; 40 CFR 60.13 and appendix B; 40 CFR 63.8 and any applicable performance specifications required pursuant to the applicable subpart of part 63; 40 CFR Part 75; and subpart H and appendix IX of part 266;
 - c. excepted or alternative monitoring methods allowed or approved pursuant to 40 CFR Part 75;
 - d. monitoring included for standards exempt from the CAM rule to the extent such monitoring is applicable to the performance of the control device (and associated capture system) for the pollutant specific emissions unit; and
 - e. presumptively acceptable monitoring identified in guidance by EPA (see the EPA CAM guidance document).

Once a complete CAM plan is created and attached to Section 4.4.1, mark “Yes” in the box found in section (9) of Table 2: CAM Plan .

If you are unable to establish indicator ranges or operating conditions by the time this application is submitted, you must provide a justification for why indicator ranges or operating conditions could not be

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established on a separate sheet of paper. The justification must also include a procedure for establishing indicator ranges or operating conditions in the future. Depending on the control device, the procedure for establishing indicator ranges could be, but is not limited to, the following:

- maximum steam rate based on the steam rate measured during a future source test plus 10%
- minimum control device temperature based on the temperature measured during a future source test minus 50 degrees
- minimum and maximum oxygen level based on the average of three months of monitoring data plus or minus one standard deviation

The procedure proposed must be precise so that when the tests are performed or a minimum amount of data is gathered, there will be no doubt as to values of the indicator range(s) and/or operating condition(s).

You must also prepare a test plan and schedule for establishing the indicator ranges as an attachment. The indicator ranges or operating conditions shall be established as expeditiously as possible, but no later than six months after the permit is issued.

Once a complete justification and description of the procedure that will be used to determine the appropriate indicator ranges and operating conditions is created and attached to Section 4.4.1, select the YES box in Section (10) of Table 2: CAM Plan. If this scenario does not apply to your specific situation, please mark N/A.

If the proposed monitoring for CAM will not be operational when the permit is issued, the applicant must provide a justification for the delay and propose an implementation schedule on a separate sheet of paper. In general, DWEE expects that the compliance assurance monitoring will be effective on the day that the permit is issued. This does not necessarily mean that the indicator ranges must be established prior to issuance of the permit, as the Operating Permit can include the procedure for establishing the parameters within some acceptable time period (generally not to exceed six months). However, in some situations, it may not be possible to obtain the monitoring equipment before the permit is issued. In those very limited cases, the permit will have to include an implementation schedule for installing, testing, and operating the proposed monitoring.

Once a complete justification for delay in CAM utilization and an implementation schedule is prepared and attached to Section 4.4.1, select the YES box in Section (11) of Table 2: CAM Plan. If this scenario does not apply to your specific situation, please mark N/A.