

Oregon Title V Monitoring and Testing Guidance

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Oregon Title V Monitoring and Testing Guidance

I. Introduction:

This document offers guidance on monitoring that satisfies the requirements of the Title V Operating Permit program. In addition to this guidance, EPA's Compliance Assurance Monitoring Technical Guidance document gives additional information.

As stated in the Title V regulations, each permit shall contain monitoring as follows:

“All emissions monitoring and analysis procedures or test methods required under the applicable requirements, including any procedures and methods promulgated pursuant to sections 504(b) or 114(a)(3) of the Federal Clean Air Act (FCAA)

Where the applicable requirement does not require periodic testing or instrumental or non-instrumental monitoring (which may consist of recordkeeping designed to serve as monitoring), **periodic monitoring** sufficient to yield reliable data from the relevant time period that are representative of the source's compliance with the permit, as reported pursuant to OAR 340-218-0050(3)(c).” [OAR 340-218-0050(3)(a)(B) and (C) and 40 CFR 70.6(a)(3)]

In addition, larger emissions units with pollution control equipment are also subject to the Compliance Assurance Monitoring (CAM) requirements in OAR 340-212-0200 through 340-212-0280 and 40 CFR, Part 64. By satisfying the CAM requirements, the owner or operator will also satisfy the general Title V monitoring requirements.

Simply stated, the primary purpose of the monitoring is to provide the responsible official with information that is sufficient for providing a reasonable assurance of ongoing compliance with the applicable requirements (e.g., emissions limits and standards) in the permit. Both Title V and CAM allow the owner or operator of a Title V facility to select monitoring procedures that are best for their specific emissions units. "Best" as used in this context does not necessarily mean the best technologically available. Instead, it means the most reasonable for a particular emissions unit taking into consideration the pollutant, emission limit, process and operating conditions, and the historical compliance record in conjunction with the potential emissions variability. As such, the selection process is not intended to be a top-down analysis.

Since there are potentially numerous monitoring strategies for any one emissions unit, this document offers guidance for the selection of appropriate monitoring. It is intended that this document would be used as a starting point for determining appropriate monitoring. Of course, it is not possible to include every type of emissions unit that will be encountered at facilities in this document nor should these proposed monitoring strategies be considered requirements. The source owner or operator may propose alternative monitoring if desired. However, if alternative monitoring is proposed, it is expected that sufficient justification for the alternative monitoring be included in the permit application.

A description of the monitoring is required to be submitted with the Title V permit application. Forms are provided in the application packet for describing the monitoring approach for each emissions unit and pollutant. An explanation of the sequence of events leading to the development of monitoring protocols is provided below.

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II. Preliminary information:

A. Identify individual pieces of equipment, processes, or activities at the facility:

The first step is to identify all sources of emissions, which would be any process, piece of equipment, or activity that has the potential to emit any regulated pollutant. The regulated pollutants may be any one of the following:

1. Total suspended particulate (TSP) and particulate matter less than 10 microns (PM₁₀)
2. Carbon monoxide (CO)
3. Oxides of nitrogen (NO_x)
4. Volatile organic compounds (VOC)
5. Sulfur dioxide (SO₂)
6. Sulfuric acid mist
7. Total reduced sulfur (TRS)
8. Hydrogen sulfide (H₂S)
9. Hydrogen chloride (HCl)
10. Fluoride (F⁻)
11. Lead
12. Chloro-fluoro-carbons (CFCs)
13. Any pollutant for which there is standard under section 111 (New Source Performance Standards-NSPS) or 112 (National Emission Standards for Hazardous Air Pollutants-NESHAP)

The best place to start compiling a list of sources of emissions and the associated regulated pollutants is from the current Air Contaminant Discharge Permit (ACDP) or Oregon Title V Operating Permit. However, be aware that the ACDP may not include all sources of emissions and all associated pollutants at the facility. Therefore, the facility should be surveyed for any additional sources of regulated pollutant emissions, including categorically insignificant activities and aggregate emissions units, as defined in OAR 340-200-0020

B. Quantify emissions:

After identifying all of the sources of emissions, the next step is to quantify the emissions. This information may be used to establish emission limits in the permit and will be used to determine if CAM is applicable to a pollutant-specific emissions unit. The emissions inventory should be based on potential emissions. That is to say that unless there is a federally enforceable condition in the permit limiting emissions (production restrictions and/or control devices), emissions should be based on full time maximum production: 24 hours a day, 365 days a year. After the potential emissions have been quantified, the owner or operator may consider adding federally enforceable emission limitations to the permit to either avoid CAM or to become a synthetic minor source and avoid Title V permitting.

Emission inventories should be determined from the best available information. It is not required that each source of emissions be tested to determine the emissions prior to the permit application. However, in some cases where no information is available and there is reason to believe that

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emissions may be significant, it may be wise to conduct some initial screening tests. Sources of information for developing emission inventories may include, but are not limited to the following:

1. Continuous monitoring data
2. Stack tests within the last ten years and no significant modifications to the process.
3. Material balances
4. Fuel sampling and analysis
5. Emission factors: AP-42, NCASI (spell out), other industry groups.
6. Other estimates with supporting documentation.

In most cases, it is probably best to assume the worst case emissions situation. For example, if a control device has a tested efficiency of 99% and a rated efficiency of 95%, it may be safer to estimate emissions based on the lower efficiency. This would probably ensure compliance during future monitoring. On the other hand, if using the lower efficiency to estimate emissions, combined with other emissions from the facility, results in a significant increase over the current permitted emissions leading to New Source Review (NSR) or Prevention of Significant Deterioration (PSD), it may be better to use the tested efficiency rather than the rated efficiency.

Emission inventories also have to be developed for hazardous air pollutants (HAP) but the owner or operator will not have to develop any monitoring beyond what is required by the applicable NESHAP.

C. Identify emissions units.

After identifying the individual pieces of equipment, processes, or activities, and completing the emissions inventory, it is necessary to determine the applicable requirements (e.g., emission limits and standards). If similar pieces of equipment, processes, and/or activities have the same applicable requirements and the same monitoring, it may simplify the permitting process to combine them into a single emissions unit. However, keep in mind that if the combined uncontrolled potential emissions are greater than 100 tons, CAM would be required for the emissions unit; whereas, CAM may not be required if each individual piece of equipment, process, or activity is considered an individual emissions unit.

D. Develop Monitoring Protocol:

Step 1: After the emissions units have been identified and emission inventories developed for each regulated pollutant, monitoring will have to be determined for each applicable requirement for each emissions unit. The first step would be to divide the emissions units into those that have add-on control devices and those that are uncontrolled. The controlled emissions units would then also be divided into those that are subject to CAM and those that are subject to the general monitoring requirements of Title V.

Except for backup utility units, CAM applies to pollutant-specific emissions if the emissions unit satisfies all of the following criteria:

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- The emissions unit is subject to an emissions limitation or standard for the applicable regulated air pollutant (or a surrogate thereof), except for the following emissions limits or standards:
 - Emission limitations or standards proposed by the Administrator after November 15, 1990 pursuant to Section 111 or 112 of the Clean Air Act (Act).
 - Stratospheric ozone protection requirements under Title VI of the Act.
 - Acid Rain Program requirements pursuant to sections 404, 405, 406, 407(a), 407(b), or 410 of the Act.
 - Emission limitations or standards or other applicable requirements that apply solely under an emissions trading program approved or promulgated by the Administrator under the Act that allows for trading emissions within a source or between sources.
 - An emissions cap that meets the requirements specified in 40 CFR 70.4(b)(12), 71.6(a)(13)(iii), or 340-222-0010 through 340-222-0080 (Plant Site Emission Limits).
 - Emission limitations or standards for which an Oregon Title V Operating Permit specifies a continuous compliance determination method, as defined in OAR 340-200-0020. The exemption provided in this subsection shall not apply if the applicable compliance method includes 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 an incinerator 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, CAM would apply to the control device and capture system, but not to the remaining elements of the coating line, such as raw material usage).
- The emissions unit has a control device to achieve compliance with any such emission limitation or standard; and
- The emissions unit has potential pre-control device emissions of the applicable regulated pollutant that are equal to or greater than 100 tons per year. “Potential pre-control device emissions” shall have the same meaning as “potential to emit”, as defined in OAR 340-200-0020, except that emissions reductions achieved by the applicable control device shall not be taken into account.

Step 2: The second step is to review the applicable regulations for any monitoring that is currently required. If monitoring is already required by a regulation, that monitoring must be used in the permit unless a specific request is approved to use alternative monitoring. The alternative monitoring should be approved prior to the permit being issued. In some cases EPA approval will also be necessary; especially for alternatives to NSPS monitoring.

Table 1 (attached) lists monitoring required by Oregon Administrative Rules. Many of the NSPS and NESHAP also include monitoring and testing requirements. In addition to Table 1, the owner or operator should consider any monitoring included in a standard that EPA has proposed for a source category, but not yet promulgated. If there is no Federal or State required monitoring for the emissions unit being considered, proceed to Table 2 (attached) or the CAM Technical Guidance document, if applicable, for guidance on selecting appropriate compliance monitoring.

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Step 3: Table 2 provides monitoring guidance for the most commonly encountered industries in Oregon. There are about 130 Title V facilities in Oregon. Of these, approximately 50% of the sources are wood product facilities. Therefore, Table 2 begins with the wood products industry. The table refers back to wood products for facilities with emissions units similar to the wood products industry. Table 3 (attached) provides more detailed monitoring guidance for the emissions units. For emissions units subject to CAM, there are additional requirements beyond this guidance. The owner or operator should refer to the specific regulations and EPA's CAM Technical Guidance Document. Provided below is a discussion of the various types of monitoring approaches identified in the tables:

1. Table 2 refers to Emission Factors (EF) for determining compliance with Plant Site Emissions Limits (PSELs) that are based only on the PSEL rule and do not include other regulations such as NSPS, OARs, NSR, or PSD. An emission factor is a form of parametric monitoring that is based on the relationship between the pollutant emissions rate and emissions unit's process rate such as boiler steam production (e.g. 0.3 lbs of NO_x/1000 lbs of steam). In general, the monitoring would consist of parameter monitoring (i.e. gallons of fuel oil burned, pounds of steam produced, square feet of board produced, etc.) and calculating emissions using an established emission factor. In addition, most permits will include a requirement to perform testing for the purpose of confirming that the emission factors are reasonable for the specific source. The frequency of emission factor verification testing is generally associated with the quantity of emissions, but may be adjusted or even not required for some emissions units if there is already considerable data supporting the use of the emission factor.

Note: Two or more types of monitoring may be suggested in the guidance tables. If so, they are usually separated by a /. The monitoring on the left of the slash is for determining compliance with PSELs without any other underlying regulatory limits. The monitoring on the right of the slash is monitoring or testing suggested for all other regulatory limits including PSELs based on other underlying regulations.

2. Parametric monitoring may also be used for PSELs based on NSR and PSD, or other regulatory limits such as NSPS and OAR limits. For these types of limits, the parametric monitoring could be designed to ensure good operation and maintenance (O&M) practices for process and pollution control equipment; or, the parametric monitoring may be used to predict actual pollutant emissions.

2.a. O&M monitoring does not provide a direct measure of compliance, but, if designed properly, should provide a reasonable assurance of compliance sufficient to satisfy the requirements of Title V monitoring. The basic principle is that if the process and pollution control equipment used to achieve compliance with the standard are properly operated and maintained there should be a reasonable assurance of ongoing compliance. For this type of parameter monitoring, the owner or operator should identify the key parameters that are good indicators of process and/or control device performance. For each parameter, the owner or operator would then establish operating ranges (or minimum or maximum levels) that would define good operating performance. To ensure compliance with the standard, the owner or operator would be obligated to perform corrective action whenever there is an excursion of the parameter range, taking into consideration the averaging time of the standard. For larger emissions units, O&M monitoring is defined by the CAM rules.

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O&M monitoring plans need to include the following information:

- Process or control device parameters that are good indicators of performance;
- Parameter action levels expressed as a range of values or a minimum or maximum level;
- The basis of the parameter action levels (e.g., manufacturer's recommendations, design criteria, test data, etc.);
- Compliance demonstration data while operating within the parameter action levels (if this information is not available at the time of the application, the permit can include a schedule to perform the test);
- Monitoring equipment and quality assurance;
- Frequency of monitoring (e.g., continuous, hourly, daily, weekly, monthly);
- Data averaging (should take into consideration the averaging time of the standard, but it is not always necessary to use the same averaging period as the standard. For instance, it is not necessary to monitor the sulfur content of the fuel every hour for a 3-hour SO₂ limit if a sample of the fuel is analyzed for each shipment of fuel or the vendor provides a fuel certification);
- Minimum data availability;
- Period of time for initiating corrective action (again, the averaging period of the standard should be considered);
- Contingencies for situations in which the corrective action cannot be initiated or the corrective action is not effective (e.g., additional checks such as visible emissions monitoring);
- Recordkeeping (maintain records of data averages, action level excursions, and corrective action);
- Reporting (report action level excursions with the semi-annual monitoring reports); and
- Other factors to consider when developing the monitoring plan are discussed in section III, "Factors for Selecting Appropriate Monitoring"

2.b. The other type of parametric monitoring uses parameters to predict pollutant emissions. For this type of parameter monitoring, it would be necessary to develop a correlation between the parameter and the pollutant emissions. The correlation could be established using source test data or continuous emissions monitoring data over the range of expected parameters and/or process rates. For example, NO_x emissions from a natural gas boiler may be fairly predictable as long as the excess oxygen remains within an acceptable range of 3 to 5%. A series of NO_x source tests may be conducted over the range of boiler operating rates while measuring excess oxygen. A curve could then be generated depicting the NO_x emissions as a function of boiler load and excess oxygen. The predictive parameter monitoring would consist of continuously monitoring boiler load and excess oxygen to continuously determine NO_x emissions. The correlation between the emissions and the parameters would have to be verified by conducting a source test at least once during the permit term (typically, once every 5 years).

3. Continuous emissions monitoring systems (CEMS) or continuous opacity monitoring systems (COMS) are always options for satisfying the Title V monitoring requirements. If these types of monitoring are used, they should be installed and operated in accordance with the Department's Continuous Monitoring Manual or federal requirements for NSPS (40 CFR 60.13).

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For any new CEMS, an initial performance specification test must be conducted to verify that the CEMS is installed and operating correctly.

4. Inspection and maintenance records may also be used to satisfy the Title V monitoring requirements. These can range from periodic equipment checks to routine visible emissions surveys, depending on the type of process or equipment. For instance, for an uncontrolled cyclone, daily visible emissions measurements coupled with weekly checks of the duct work, fans, and hopper system may be adequate monitoring. For baghouses, daily visible emissions surveys along with monthly inspections of the bags may be reasonable monitoring. Examples of I&M recordkeeping include but are not limited to the following:

- Daily inspections of baghouses for the presence of any visible emissions
- Routine inspections of baghouses for any damaged or leaking bags
- Bag replacement schedules for baghouses.
- Inspect multiclones for any missing or damaged cyclones
- Inspect wiring and rapping cycles for ESPs
- Inspect venturi throats, water supply lines, and nozzles for wet scrubbers.

5. Table 4 (attached) includes general recommendations for visible emissions monitoring. Since almost all emissions units are subject to at least the state visible emissions limit of 20% or 40% opacity, most permits will include some type of visible emissions monitoring. This may consist of routine Method 9 tests to actually quantify emissions, or periodic checks to determine if any visible emissions are present. In general, the frequency of the monitoring is based on the level of the associated particulate matter emissions. However, depending on the compliance history, the suggested frequencies may be increased or decreased as appropriate. The various types of visible emissions monitoring are summarized below.

- EPA Method 9 tests to quantify emissions as six minute averages (NSPS and veneer dryers)
- EPA Method 9 tests to determine if any readings during an observation period are equal to or greater than the limit. If so, longer observation periods may be required. (general state opacity limits)
- EPA Method 22 or some version of EPA Method 22 for verifying that there are no visible emissions from sources that do not normally have visible emissions. This would be applicable to sources that have potential visible emissions, but do not typically exhibit any visible emissions, such as baghouses.

Note: Method 9 is an EPA reference test method that specifies visible emissions observation (readings) be taken every 15 seconds and the data is reduced to 6 minute averages using 24 consecutive readings. However, Oregon's opacity limits are based on the aggregate period of time in any 60 minute period that the visible emissions are equal to or greater than the limit (20% or 40% opacity). For this standard, EPA Method 9 is used, but the individual readings are used to determine the aggregate period rather than calculating six-minute averages. Each reading represents 15 seconds of time. (See the definition of opacity in OAR 340-208-0010)

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There are some exceptions to the general recommendations in Table 4 and these include natural gas combustion devices such as boilers and gas turbines (not material dryers). For these types of emission units, it is not expected that visible emissions monitoring would be necessary because it is unlikely that there would be any visible emissions other than condensed water vapor. Instead, the monitoring would be recordkeeping by tracking the type of fuel being burned.

The visible emissions monitoring for other emissions units may be reduced over time by demonstrating a safe margin of compliance for an agreed period of time. For example, the monitoring protocol may include provisions for reducing the Method 9 observations from daily to weekly to monthly to once every six months by successfully demonstrating compliance daily for 14 days, weekly for 4 weeks, monthly for 4 months, and once every 6 months thereafter. These plans would have to be proposed in the application along with criteria for reducing the monitoring frequency. A safe margin of compliance is generally considered to be no readings equal to or greater than the opacity limit during a minimum observation period of six minutes.

In many cases, visible emissions monitoring can also be used to provide a reasonable assurance of compliance with particulate emissions standards such as the general grain loading standards in Division 226. This is especially true for uncontrolled emissions units, but it will still depend on the type of emissions and supporting source test information. As shown in Table 2, the monitoring suggested for many of the emissions units refers to Tables 3 and 4.

If appropriate monitoring cannot be obtained from either Tables 1, 2, 3, 4, or the CAM Technical Guidance Document; or, if the suggested monitoring from these references is unsatisfactory for the emissions unit being considered (i.e. the suggested monitoring does not work for the specific emissions unit or is too costly), a monitoring alternative will have to be proposed in the permit application along with a justification. The justification would have to include the following information:

1. The rationale for selecting the proposed monitoring versus the monitoring suggested in this or other guidance; and
2. Supporting documentation, including test data, demonstrating that the proposed monitoring would be effective for providing a reasonable assurance of ongoing compliance with the emissions limits and standards.

In some rare cases, monitoring may not be necessary for providing a reasonable assurance of compliance because the emissions are insignificant and there is no potential for exceeding the standards. As discussed above, the Department believes that small natural gas fired boilers are an example of an emissions unit that does not require any monitoring for assuring compliance with the visible emissions and particulate matter emission limits. In general, the Department also believes that categorically insignificant activities and aggregate insignificant emissions units, as defined in OAR 340-200-0020, do not require monitoring. However, the owner or operator will have to verify that any activities included in the aggregate insignificant emissions unit do not require monitoring. Special attention should be paid to any sources that have add-on controls, as well as any sources that are subject to a NSPS or NESHAP requirements.

III. Factors for selecting appropriate monitoring:

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All of the following factors should be considered when developing monitoring protocols:

- Pollutant/Applicable requirement, including averaging times
- Emission unit type, vintage, and design (older, less reliable emissions units generally require more monitoring to ensure ongoing compliance)
- Control device type, vintage, and design (older, less reliable control devices generally require more monitoring to ensure ongoing compliance)
- Compliance history (emission units with a good compliance record (e.g., consistent test results below the standard over an extended period of time) generally do not require as much monitoring to ensure ongoing compliance)
- Margin of compliance (emission units with emissions well below the standard (e.g., <50% of the standard) generally do not require as much monitoring to ensure ongoing compliance)
- Emissions variability (emissions units with highly variable process rates or materials generally require more monitoring to ensure ongoing compliance)
- Quantity of emissions (emissions units that will have more impact on the environment generally require more monitoring to ensure ongoing compliance)
- Future regulations (sources that will be subject to MACT standards that have not been promulgated may base their monitoring or testing on proposed standards)
- Cost (cost should be considered when there are several monitoring options)

IV. Source Testing

Table 2 also includes recommendations for minimum source test frequencies. This is because source testing is considered the most reliable and economic method of determining compliance as long as the testing is not required to be performed too frequently. Testing is not considered monitoring, but may be used to show that monitoring may or may not be necessary for an emissions unit. As mentioned earlier, the application should provide a discussion for why monitoring is not required.

Whether or not testing should be required and the frequency of the testing should be based on the same factors as described above for developing monitoring. A few additional considerations are provided below. At a minimum, the permit must include any testing required by an applicable requirement.

When an emissions unit consists of more than one compliance demonstration point, the testing may be performed sequentially at each point. Compliance demonstration points are all exhaust points from an emissions unit that would have to be measured to fully demonstrate compliance with the emissions limit or standard. For example an emissions unit consisting of three identical boilers with three individual stacks would have three compliance determination points. In this case, each of the boilers could be tested separately to determine compliance.

However, if a single piece of equipment, process, or activity has more than one stack, the source testing should be conducted simultaneously on each of these stacks. For example, if a single boiler has three scrubbers and three stacks, the three stacks should be tested simultaneously. When there

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are more than two stacks, not all of the stacks have to be tested simultaneously but at least two of the stacks should always be tested simultaneously. The Department can provide guidance for this type of testing.

In some cases, multiple stationary sources may be similar enough that it is not necessary to test each source; especially if the testing is for the purpose of verifying an emission factor used for establishing Plant Site Emission Limits or for compliance monitoring. For example, a facility may have 5 veneer dryers, all with the same design and control devices. Provided the same type of material is dried in each dryer, it may be reasonable to test only one or two of the dryers for emission factor verification purposes.

Reduced compliance testing may also be an option if each of the similar stationary sources has been tested at least once and there is other information that can be used to assure ongoing compliance with the emission limits. For example, if there are two identical boilers and both of them have an ESP for controlling particulate matter emissions, testing one of the boilers each permit term instead of testing both boilers may be adequate. Ongoing visible emissions monitoring could be used to verify that the ESPs are working properly.

In some cases, testing may no longer be necessary to assure compliance, if a stationary source has been tested several times (at least two times) and the emissions have been less than 75% of the standard and there are other parameters that can be monitored to ensure that the source is being operated properly. This would be especially true for sources that do not have control devices but very low emissions, such as natural gas boilers. This allowance or consideration would be re-evaluated when the permit is renewed.

For sources that will be subject to a MACT standard but the MACT standard has not been promulgated, the owner or operator may propose testing based on a proposed standard or request that testing be deferred until the standard is promulgated. Testing may be deferred if it is anticipated that the MACT standard will be promulgated within 2 years the permit is issued because the permit will have to be reopened to include the MACT standard. Interim testing requirements should be included in the permit if it is expected that the MACT standard will be promulgated later than 2 years after the permit is issued. Even though a new standard may be eminent, testing may not be deferred if there are other reasons to have the testing performed, such as verifying questionable emission factors.

The frequency and amount of testing needs to be worked out between the DEQ permit writer and the owner or operator of the facility. The owner or operator should provide the necessary information in the permit application to justify reduced testing frequencies.

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V. Title V Permit Application:

Once the monitoring has been identified, information about the monitoring is transferred to the permit application forms (CP701 through CP706 and CP709 for CAM). When filling out the forms, provide as much information as possible with at least a general description of the monitoring protocol. For new monitoring protocols, provide a schedule for when specific information, such as manufacturer and model numbers, if not currently available, will be provided. Some further guidance on completing the forms is provided below.

A. Continuous monitoring systems:

1. Complete the form as much as possible and provide a schedule for submitting the missing information once it has been obtained. This is especially applicable to new CMS that will be purchased and installed after the permit is issued.
2. Attach a general source test plan and schedule for conducting performance specification testing and submission of test results if performance specification testing is required. Existing performance specification test results may be submitted with the application or a statement may be provided indicating when the results were submitted to the Department.
3. Attach a Quality Assurance Plan if required (refer to applicable requirement). In lieu of the QAP being attached to the application, a schedule may be attached for when the QAP will be submitted if one does not already exist or the existing QAP has to be modified.

B. Parameter monitoring:

1. Attach supporting documentation for the parameter action levels. The documentation should include test data demonstrating compliance within a range of process or control device parameter action levels. The parameter could also be used to predict actual pollutant emissions. The test data does not have to be site specific but an explanation of applicability should be included if the data is not site specific. In some cases, the parameter action levels or predictive relationship may be based on theory or existing emission factors without test data. Adequate justification for parameter action levels or predictive relationships based on other than test data should be provided with the application.
2. Attach a general source test plan (see stack testing) and schedule for conducting parameter verification testing and submission of test results if parameter verification testing is required. Existing parameter verification test results may be submitted with the application or a statement may be provided indicating when the results were submitted to the Department.

E. Inspection and Maintenance procedures:

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Attach a description of any inspection and maintenance procedures that may be used to provide a reasonable assurance of compliance with the emission limitations. Also specify the types of records that will be maintained and the frequency of the records.

F. Fuel Sampling and Analysis:

Either identify the fuel analysis method to be used or indicate that the supplier will provide a certificate of analysis. If the supplier is conducting the analysis, confirm the analytical method.

G. Recordkeeping:

Attach an adequate description of what records are being maintained, the frequency of collecting the information, and the relationship of the records to the emission limitations.

VI. Frequently used abbreviations and acronyms

<u>Abbreviation/ acronym</u>	<u>Complete word/phrase</u>
CD	Control device
CEM	Continuous emissions monitoring
CMS	Continuous monitoring system
CO	Carbon monoxide
COMS	Continuous opacity monitoring system
CPMS	Continuous parameter monitoring system
CDP	Compliance demonstration point
E	Emissions
EF	Emission factor relating pollutant mass emissions to process parameter, which is used in conjunction with monitoring the process parameter to demonstrate compliance with short and long term PSEL. The emission factor must be approved by the Department and may be different values for the short and long term PSEL evaluations. In general, the short term emission factor would be the maximum expected emissions per process parameter while the long term emission factor would be the average expected emissions per process parameter. It would not be expected that these emission factors be verified during the life of the permit.
EF ₁	Same as EF, except that the emission factor would have to be verified by conducting a source test at least once during the life of the permit. The source test would be used to verify the emission factor and could be the basis for adjusting the emission factor by administrative amendment to the permit or revised during permit renewal. The permittee would have to notify the Department of source tests that result in a measured emission factor greater than the emission factor approved for demonstrating compliance. This notification should occur within 60 days of completing the source test. The Department would evaluate the request to increase the emission factor and

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	PSEL and either amend the permit or wait until the permit is renewed. In some cases, the Department may request additional test data; especially if the new factor is significantly different than the one used in the permit and there are extenuating circumstances or actual increases in emissions.
EF ₂	Same as EF ₁ , except that the verification test would be conducted at least twice during the life of the permit.
FSA ₁	Fuel sampling and analysis - based on supplier's certificate
FSA ₂	Fuel sampling and analysis - based on periodic analysis of fuel samples
HAP	Hazardous Air Pollutant
MACT	Maximum Available Control Technology (applies to HAPs)
MB ₁	Material balance determined annually
MB ₂	Material balance determined monthly
I&M	Inspection and Maintenance procedures and associated recordkeeping
NA	Not applicable
NESHAP	National Emission Standards for Hazardous Air Pollutants (40 CFR Part 63)
NSPS	New Source Performance Standards (40 CFR Part 60)
NSR	New source review
NO _x	Oxides of nitrogen
OAR	Oregon Administrative Rules
O ₂	Oxygen
PM/PM ₁₀	Total suspended particulate and/or particulate matter less than 10 microns
PSD	Prevention of significant deterioration
PSEL	Plant site emission limit as determined by OAR Chapter 340 Division 222
SO ₂	Sulfur dioxide
ST ₁	Source test conducted once in 5 years (life of permit)
ST ₂	Source test conducted once every year
ST _{2a}	For emissions units with only PSELS, source test conducted once during the life of the permit. For emissions units with other regulatory limits or PSELS based on NSR or PSD, source test conducted every year unless 2 consecutive test results < 75% of the limit, then testing once every 5 years
ST _{2b}	Source test conducted at least twice during the life of the permit.
ST ₃	Source testing once every 3 months
ST _{3a}	Source testing once every 3 months unless 4 consecutive test results < 75% of the limit, then testing would be once every year
ST _{3b}	Source testing once every 3 months unless 6 consecutive test results < 75% of the limit, then testing would be once every six months
ST ₄	Source testing once every month
ST ₅	Source testing once every six months
TO	Thermal oxidizer including afterburners and catalytic oxidizers
V	Variability
VOC	Volatile organic compounds

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Table 1. Oregon Administrative Rules with monitoring requirements:

Facility category	Applicable regulation	Pollutant	Process	Monitoring/Testing
Petroleum Refinery leaks	340-232-0140	VOC	tank seals, valves, drains	Periodic monitoring and inspection
Liquid Storage Tanks	340-232-0150	VOC	tank seals, vapor pressure, temperature	Inspection/maintenance
Surface coating	340-232-0160	VOC	entire process	Recordkeeping/material balance
Aerospace component coating operations	340-232-0170	VOC	entire process	Recordkeeping/material balance
Degreasers	340-232-0180 to -0190	VOC	entire process	Recordkeeping/material balance/inspection
Flatwood coating	340-232-0220	VOC	entire process w/o control device	Recordkeeping/material balance
			entire process with control device	TO temperature monitoring
Rotogravure and Flexographic Printing	340-232-0230	VOC	entire process w/o control device	Recordkeeping/material balance
			entire process with control device	TO temperature monitoring
Perchloroethylene Dry Cleaning	340-232-0240	VOC	entire process w/o control	Recordkeeping/material balance
			entire process with control device	TO temperature monitoring
Gasoline Reid vapor pressure	340-258-0400	VOC	entire process	Periodic monitoring and recordkeeping
Gasoline transfer and dispensing operations	340-242-0500	VOC	entire process	Maintenance procedures
Reduction of Animal Matter	340-236-0310	VOC	Afterburner	TO temperature monitoring/process rates
Kraft Pulp Mills	340-234-0240	PM, SO ₂ , TRS	recovery furnace	CEM and source testing
		PM and TRS	lime kiln	CEM and source testing
		TRS	miscellaneous vents	source testing
		PM and TRS	smelt dissolving tank vents	source testing
Neutral Sulfite Mills	340-234-0340	PM, SO ₂ , TRS	spent liquor incinerator	source testing
		SO ₂	acid absorption tower	source testing
Primary Aluminum	340-236-0140	PM and fluoride	pot room and roof vents	source testing

Oregon Title V monitoring and testing guidance

Table 1 cont. Oregon Administrative Rules with monitoring requirements:

Facility category	Applicable regulation	Pollutant	Process	Monitoring/Testing
Plywood manufacturing	340-234-0510	Opacity	veneer dryers	periodic monitoring - Method 9
Particleboard manufacturing	340-234-0520	PM	truck dump and storage piles	enclosure maintenance
Hardboard manufacturing	340-234-0530	PM	truck dump and storage piles	enclosure maintenance
Sulfite Pulp Mills	340-234-0410	PM and SO ₂	recovery furnace	source testing
		SO ₂	Blow system and acid plant	source testing
Laterite Ore Production of Ferronickel	340-236-0200	PM	entire process	source testing
New Source Performance Standards	340-238-0060	See 40 CFR Part 60 for monitoring and testing requirements		
Incinerators	340-230-0130	Opacity, SO ₂ , CO, NO _x , comb. temp.	solid waste incinerators	COMS and CEM
		PM, HCl, SO ₂ , NO _x , CO	solid waste incinerators	source testing
		CO, opacity, comb. temp.	infectious waste incinerators	COMS and CEM
		PM, HCl, SO ₂ , CO, NO _x	infectious waste incinerators	source testing
Municipal waste combustors	340-230-0340	PM, Metals, HCl, SO ₂ , NO _x , CO, Organics, operating parameters	Municipal waste combustors	Source testing, CEMS, CPMS
Medford AQMA	340-240-0210	CO, Opacity	boiler >35x10 ⁶ Btu/hr w/o wet scrubber	CEM and COMS
		CO, ΔP, H ₂ O press. and flow	boiler >35x10 ⁶ Btu/hr with wet scrubber	CEM and CPMS
		Opacity	boiler < 35x10 ⁶ Btu/hr	COMS
		PM	boiler	source testing
		PM	veneer dryers	CPMS and source testing
		PM	particle dryers	CPMS and source testing
		PM	charcoal plant	source testing
National Emission Standards for Hazardous Air Pollutants (NESHAP)	340-244-0220	See 40 CFR Part 63 for monitoring and testing requirements		

Oregon Title V monitoring and testing guidance

Table 2. Guidance for selecting appropriate testing and monitoring

Note: Two or more types of monitoring may be suggested in the guidance tables. If so, they are usually separated by a /. The monitoring on the left of the slash is for determining compliance with PSELS without any other underlying regulatory limits. The monitoring on the right of the slash is monitoring or testing suggested for all other regulatory limits including PSELS based on other underlying regulations.

Facility Category	Emission Unit Category	Pollutant	Uncontrolled emission units			Controlled emission units
			<10 tons *	10-99 tons **	>100 tons	
Wood Products	Boiler - wood	PM/PM ₁₀	EF/Table 3	EF ₁ /ST ₁ /Table3	EF ₁ /ST _{2a} /Table 3	EF ₁ /ST _{2a} /Table 3 or CAM
		CO	EF	EF ₁ /ST ₁ /Table3	EF ₁ /ST _{2a} /Table 3	EF ₁ /ST _{2a} /Table 3 or CAM
		NO _x	EF	EF ₁ /ST ₁ /Table3	EF ₁ /ST _{2a} /Table 3	EF ₁ /ST _{2a} /Table 3 or CAM
		VOC	EF	EF ₁ /ST ₁ /Table3	EF ₁ /ST _{2a} /Table 3	EF ₁ /ST _{2a} /Table 3 or CAM
		SO ₂	EF	EF ₁ /ST ₁ /Table3	EF ₁ /ST _{2a} /Table 3	EF ₁ /ST _{2a} /Table 3 or CAM
	Boiler - Nat. Gas	PM/PM ₁₀	EF***	EF***	EF ₁ /ST _{2a} /Table 3	EF ₁ /ST _{2a} /Table 3 or CAM
		CO, NO _x , VOC, SO ₂	EF***	EF***	EF ₁ /ST _{2a} /Table 3	EF ₁ /ST _{2a} /Table 3 or CAM
	Boiler - oil and coal	PM/PM ₁₀ , CO, NO _x , VOC - same as wood fired boiler				
		SO ₂	EF	FSA ₁	FSA ₁	EF ₁ /Table 4 or CAM
	Boiler - sanderdust and mixed fuels	PM/PM ₁₀ , NO _x , CO, VOC, SO ₂ - same as for wood fired boilers				
	Dryers - steam and boiler exhaust gas	PM/PM ₁₀ , VOC same as wood fired boilers				
	Press Vents	PM/PM ₁₀	EF/Table 3	EF ₁ /ST ₁ /Table3	EF ₁ /ST _{2a} /Table 3	EF ₁ /ST _{2a} /Table 3 or CAM
		VOC	EF	EF ₁ /ST ₁ /Table3	EF ₁ /ST _{2a} /Table 3	EF ₁ /ST _{2a} /Table 3 or CAM
	Material handling	PM/PM ₁₀	EF/Table 3	EF ₁ /ST ₁ /Table3	EF ₁ /ST _{2a} /Table 3	EF ₁ /ST _{2a} /Table 3 or CAM
Surface coating	VOC	EF	Material balance	Material balance	MB/Table 3 or CAM	
Fugitive emissions - chip and fuel piles	PM/PM ₁₀	EF/Table 4 and/or I&M	EF/Table 4 and/or I&M	EF/Table 4 and/or I&M	NA	
Fugitive emissions - road dust	PM/PM ₁₀	EF/Table 4 and/or I&M	EF/Table 4 and/or I&M	EF/Table 4 and/or I&M	NA	
Food processing	Boilers, dryers, fryers, cookers	PM/PM ₁₀ , CO, NO _x , VOC, SO ₂ - same as Wood Products				

Oregon Title V monitoring and testing guidance

Table 2. Guidance for selecting appropriate monitoring and testing

Facility Category	Emission Unit Category	Pollutant	Uncontrolled emission units			Controlled emission units
			<10 tons*	10-99 tons**	>100 tons	
Asphalt plants	Drum dryers	PM/PM ₁₀	EF/Table 3	EF ₁ /ST ₁ /Table3	EF ₁ /ST _{2a} /Table 3	EF ₁ /ST _{2a} /Table 3 or CAM
		CO, NO _x , VOC, SO ₂ - same as for Wood Products boilers				
	Silos	PM/PM ₁₀	EF/Table 3	EF ₁ /ST ₁ /Table3	EF ₁ /ST _{2a} /Table 3	EF ₁ /ST _{2a} /Table 3 or CAM
		VOC	EF	EF ₁	EF ₁	EF ₁ /I&M or CAM
Fugitives - material handling and road dust	PM/PM ₁₀	EF/Table 4 and/or I&M	EF/Table 4 and/or I&M	EF/Table 4 and/or I&M	NA	
Gas Turbines	Gas Turbines - natural gas (for oil combustion- see wood fired boilers)	PM/PM ₁₀	EF***	EF***	EF***	EF ₁ /ST _{2a} /Table 3 or CAM
		CO	EF***	EF***/ST ₁	EF ₁ /ST _{2a} /Table 3	EF ₁ /ST _{2a} /Table 3 or CAM
		NO _x	EF***	EF***/ST ₁	EF ₁ /ST _{2a} /Table 3	EF ₁ /ST _{2a} /Table 3 or CAM
		VOC	EF***	EF***/ST ₁	EF ₁ /ST _{2a}	NA
		SO ₂	FSA ₁	FSA ₁	FSA ₁	NA
Pulp and Paper	Recovery furnaces	PM/PM ₁₀	EF ₁ /COMS and ST _{3b}			
		CO, VOC - same as Wood Products' wood fired boiler				
		NO _x - same as Wood Products' sanderdust boiler				
		SO ₂	EF/ST ₄	EF ₁ /ST ₄	EF ₁ /ST ₄	EF ₁ /ST ₄
	Recovery furnace	TRS	CEM	CEM	CEM	CEM
	Lime Kiln	PM/PM ₁₀	EF ₁ /ST ₅			
		CO, NO _x , VOC - same as Wood Products' boilers				
		SO ₂	EF	EF ₁ /ST ₁	EF ₁ /ST _{2a}	EF ₁ /ST _{2a} /Table 3 or CAM
TRS		CEM	CEM	CEM	CEM	

Oregon Title V monitoring and testing guidance

Table 2. Guidance for selecting appropriate monitoring and testing

Facility Category	Emission Unit Category	Pollutant	Uncontrolled emission units			Controlled emission units
			<10 tons*	10-99 tons**	>100 tons	
Pulp and paper - cont.	Smelt dissolving tank vents	PM/PM ₁₀	EF/ST _{3b}	EF ₁ /ST _{3b}	EF ₁ /ST _{3b}	EF ₁ /ST _{3b}
		TRS	EF/ST _{3b}	EF ₁ /ST _{3b}	EF ₁ /ST _{3b}	EF ₁ /ST _{3b}
	Misc. vents	TRS	EF/ST ₁	EF ₁ /ST ₁	EF ₁ /ST ₁	EF ₁ /ST ₁
	Non-condensable gas incinerator	PM/PM ₁₀	EF	EF	EF	EF/ST ₁
		CO, NO _x , VOC - same as Wood Products' boilers				
		SO ₂ - same as lime kilns				
	Paper Machines	TRS	EF	EF	NA	NA
		PM/PM ₁₀	EF	EF	NA	NA
		CO, NO _x , VOC, SO ₂	EF	EF	NA	NA
	Bleach Plants	TRS	EF	EF	NA	NA
VOC		EF	EF ₁	Material balance	MB/ST ₁ /Table 3 or CAM	
Boilers	see Wood Products' boilers					
Incinerators	Municipal waste combustors	See OAR 340-230-0340				
	Hospital waste	See OAR 340-230-0410				
	Sewage sludge	PM/PM ₁₀ , CO, NO _x , VOC, SO ₂ - same as Wood Products' boilers				

Primary and secondary smelting of metals	Dryers	see asphalt plants				
	Electric arc furnace	PM/PM ₁₀	EF/Table 3	EF ₁ /ST ₁ /Table3	EF ₁ /ST _{2a} /Table 3	EF ₁ /ST _{2a} /Table 3 or CAM
		CO, NO _x , VOC, SO ₂ - see Wood Products' boilers				
	Reheat furnace	PM/PM ₁₀ , CO, NO _x , VOC, SO ₂ - see Wood Products' natural gas fired boiler				
	Pot rooms/roof vents	PM/PM ₁₀	EF/ST ₄ /Table 4	EF/ST ₄ /Table 4	EF/ST ₄ /Table 4	EF/ST ₄ /Table 4 or CAM
		Fluoride	EF/ST ₄ /Table 4	EF/ST ₄ /Table 4	EF/ST ₄ /Table 4	EF/ST ₄ /Table 4 or CAM
		CO, NO _x , VOC, SO ₂ - see Wood Products' boiler				
Fugitives	see Wood Products					

Oregon Title V monitoring and testing guidance

Table 2. Guidance for selecting appropriate monitoring and testing

Facility Category	Emission Unit Category	Pollutant	Uncontrolled emission units			Controlled emission units
			<10 tons*	10-99 tons**	>100 tons	
Surface coating	entire process	VOC	EF	MB ₁	MB ₁	MB/Table 3 or CAM
Chemical manufacturing	valves and flanges	VOC	EF	EF	EF/inspection	NA
Printing	presses and dryers	VOC	EF	EF ₁ /MB ₁	EF ₁ /MB ₂	MB/Table 3 or CAM
Asphalt roofing	converters	VOC	EF	EF ₁ /ST ₁	EF ₁ /ST _{2a}	MB/Table 3 or CAM
Soil remediation units		VOC	EF	EF ₁ /ST ₁	EF ₁ /ST _{2a}	MB/Table 3 or CAM
Electronics	entire process	VOC	EF	MB ₁	MB ₂	MB/Table 3 or CAM

* <5 tons for particulate matter

** 5-29 tons for particulate matter

*** Emissions categories are for individual pieces of equipment within the emissions unit.

Oregon Title V monitoring and testing guidance

Table 3. Particulate emissions compliance monitoring:

Control Device	Monitoring
None	Table 4 and combustion parameters such as excess oxygen or I&M for non-combustion sources
wet scrubber	Table 4 and/or pressure drop, water flow, water pressure, or exhaust temperature and routine physical inspection
wet ESP	Table 4 and/or water flow, exhaust temperature, voltage and current
ESP	COMS or voltage and current
baghouse	COMS or VE survey and pressure drop or routine bag inspections
thermal oxidizer	CEMS or combustion chamber temperature
catalytic oxidizer	CEMS or Temperature differential across the catalyst and routine catalyst inspection
carbon bed	CEMS
selective catalytic reduction	CEMS
caustic or lime scrubber	pH and water flow

Table 4. General Opacity Monitoring Guidance:

Particulate emissions category	Minimum compliance monitoring
PM < 5 tons	Method 9 or modified Method 22 quarterly
PM 5 to 29 tons	Method 9 or modified Method 22 monthly
PM 30 to 99 tons	Method 9 or modified Method 22 weekly
PM >100 tons	Method 9 or modified Method 22 daily or COMS

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