

# Statement of Basis for Air Operating Permit 021R2M1- Final

## **Puget Sound Energy Sumas Generating Station**

Sumas, Washington

**February 28, 2023**



*Serving Island, Skagit & Whatcom Counties*

## PERMIT INFORMATION

**PUGET SOUND ENERGY, SUMAS GENERATING STATION  
1340 Thompson Lane, Sumas, Washington 98295**

<b>SIC: 4911</b> <b>NAICS: 221</b> <b>EPA AFS: 53-073-60041</b>	<b>NWCAA ID: 637-V-W</b>
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## **1 INTRODUCTION**

Puget Sound Energy is required to obtain an air operating permit for the Sumas Generating Station (PSE Sumas), pursuant to Title V of the 1990 Federal Clean Air Act and Chapter 173-401 of the Washington Administrative Code (WAC). Emissions of air pollutants from PSE Sumas do not exceed the thresholds that require an air operating permit. The facility's potential emissions are further discussed in Section 2 of this document. PSE Sumas must obtain an air operating permit due to applicability of the acid rain provisions of Title 40 Code of Federal Regulations Parts 72 and 75 (40 CFR 72 & 75).

The purpose of this Statement of Basis (SOB) is to set forth the legal and factual basis for the conditions set forth in the air operating permit and to provide background information for permit review by interested parties. In accordance with WAC 173-401-700(8), this statement of basis is not a legally enforceable document.

This is the second renewal of the air operating permit issued for PSE Sumas. The changes from the original issuance of the AOP are described below.

### **1.1 Permit Changes in the Second Renewal**

The Northwest Clean Air Agency (NWCAA) received an application for the second renewal of the PSE Sumas AOP on March 23, 2020. The application was found to be complete and PSD Sumas was notified on April 1, 2020.

For this AOP renewal, formatting throughout the AOP was updated to current NWCAA standards. Changes specific to each permit section are listed below.

#### **1.1.1 General Information and Attest**

- The Responsible Official and Corporate Inspection Contact information was updated. The permit information page now only contains the expiration date of the permit and the renewal application date.
- NWCAA signatories were updated.

#### **1.1.2 Section 2 Standard Terms and Conditions**

Section 2 of the AOP was updated with the current NWCAA standard version, which includes new and modified applicable regulations and updated reference dates.

#### **1.1.3 Section 3 Standard Terms and Conditions for NSPS and NESHAP**

Section 3 of the AOP was updated with the current NWCAA standard version consistent with the NSPS regulations that apply to PSE Sumas. New and modified applicable regulations and updated reference dates are included.

#### **1.1.4 Sections 4 and 5 Generally and Specifically Applicable Requirements**

The Generally Applicable Requirements of Section 4 were reviewed and updated. Section 4 primarily lists NWCAA and Washington Administrative Code (WAC) regulations, which often lack specific methods for compliance determination and require that additional monitoring, recordkeeping and recording provisions be added to the AOP for the purpose of compliance determination. This aspect of Air Operating Permits, known as gap-filling and sufficiency monitoring, is discussed further in Section 4.4 of this document. Gap-filled and sufficiency monitoring requirements in the AOP Section 4 were modified for this renewal to be consistent with NWCAA's new format for this section.

Section 5 has been modified by removing initial compliance conditions with which the facility has demonstrated compliance.

**1.1.5 Section 6 Acid Rain Permit**

The permittee is required to resubmit the Acid Rain Permit Application and Certificate of Representation every five years. The new documents are included in the AOP.

**1.2 Changes made in Modification 1 (Administrative Amendment)**

The responsible official was changed from Ryan Blood to Mark Carlson. Permit information on page 2 of the AOP and SOB were changed to reflect issuance of this modification.

These changes were performed in accordance with WAC 173-401-720.

## **2 FACILITY DESCRIPTION**

### **2.1 General Facility Description**

Puget Sound Energy, Inc. (PSE) owns and operates the Sumas Generating Station (PSE Sumas) which is comprised of a single natural gas fired turbine used to generate electricity for the local PSE grid. The generating station has a rated output capacity of 125 megawatts (MW) of electricity. In addition to the combustion turbine, the plant includes a steam turbine generator, a cooling tower and a 500 kilowatt (KW) diesel fired emergency generator. The facility is located on a site of approximately two acres located at 1340 Thompson Lane in Whatcom County, approximately a half mile southwest of the City of Sumas.

On July 25, 2008, PSE purchased the facility from Sumas Cogeneration Company, L.P. (SCCLP), a subsidiary of Northwest Energy Systems Co., LLC. Following the ownership change, PSE began operating the facility on August 22, 2008. Construction of the plant was originally approved by the Northwest Clean Air Agency (NWCAA) on June 25, 1991, under Order of Approval to Construct (OAC) 304. Original construction included the natural gas fired combustion turbine and diesel fired emergency generator. On April 14, 1997, the NWCAA issued OAC 611 approving the construction of a 700 HP natural gas fired boiler at the site. However, SCCLP (now dba Socco Forest Products) has retained ownership of this boiler, and the boiler operates independently, and for different purposes, from the PSE facility. It is therefore not included in this air operating permit.

When the facility was purchased by PSE, a regulated utility, it became subject to the acid rain provisions of 40 CFR 72 and 40 CFR 75. Because of acid rain program applicability, the facility became subject to the air operating permit program of 40 CFR 70. The first air operating permit (AOP) for the facility was issued by NWCAA on 1/1/2011.

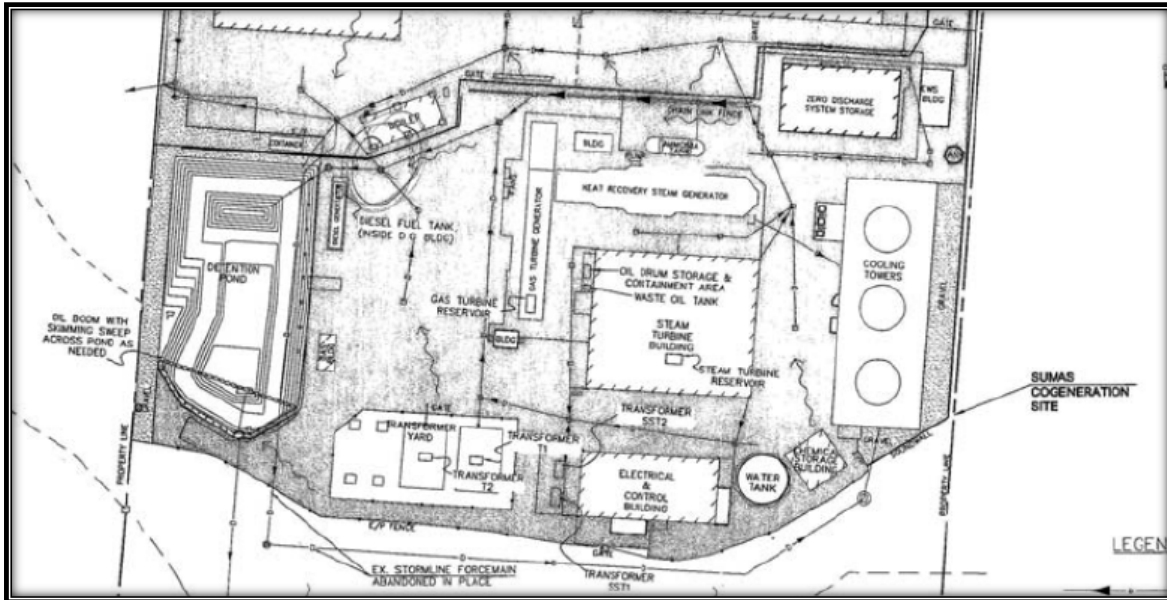


**Figure 1 PSE Sumas Location, circled in red**

## **2.2 Emission Unit Description**

PSE Sumas is a combined-cycle, co-generation plant powered by a single natural gas-fired combustion turbine (EU-1). The combustion turbine has a maximum fuel consumption rating of 1,138 million British thermal units per hour (MMBtu/hr). The high temperature exhaust produced by the combustion turbine generates steam in the heat recovery steam generator (HRSG). High pressure steam from the HRSG drives a steam turbine generator. Medium pressure steam is injected into the combustion turbine to help control NO<sub>x</sub> emissions. Low pressure steam can be sent to the adjacent lumber mill for kiln drying. The plant includes a non-contact cooling tower where water is evaporated to dissipate heat and condense the steam. The cooling tower is equipped with drift eliminators to reduce water loss. The plant also includes a 500 KW diesel-fired emergency generator (EU-2) that is used to provide backup heat and lighting in the event of an electrical power outage.





**Figure 2 PSE Sumas Site Plan**

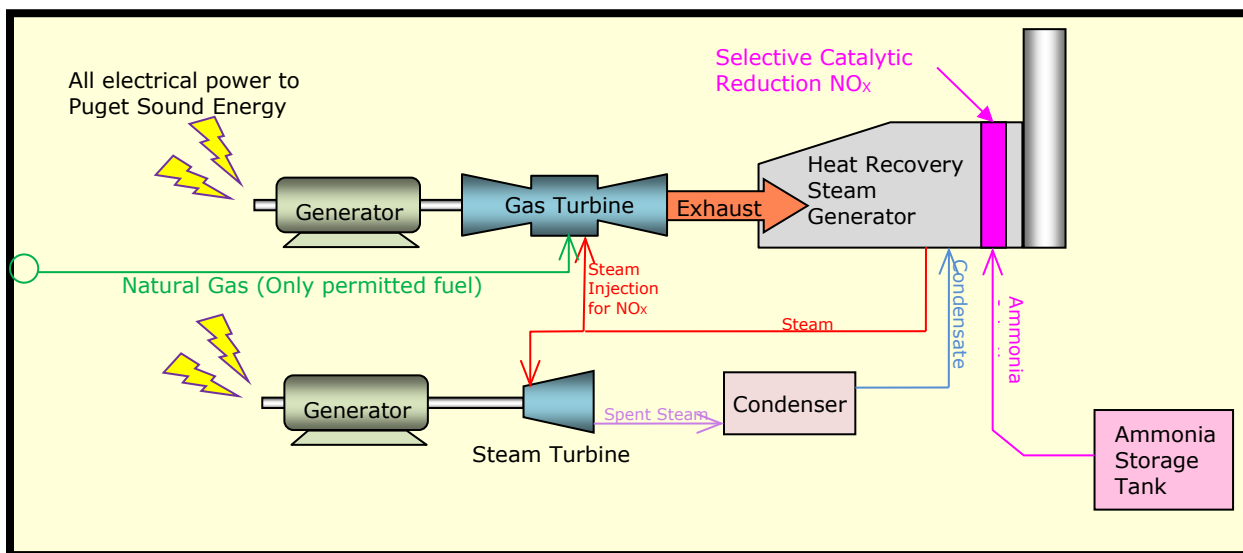
Emissions units are listed in Section 1 of the AOP. These include the natural gas fired combustion turbine (EU-1) and emergency diesel fired generator (EU-2). Other, “insignificant emission units” (IEU) are listed in Section 6 of this document.

### 2.2.1 Combustion Turbine (EU-1)

The General Electric Frame 7EA combustion turbine emits products of combustion including nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), particulate matter (PM<sub>10</sub>, and PM<sub>2.5</sub>), sulfur dioxide (SO<sub>2</sub>), and volatile organic compounds (VOC). NO<sub>x</sub> emissions are controlled using steam injection in the combustion section of the turbine and through selective catalytic reduction (SCR) for the exhaust gas. Ammonia (NH<sub>3</sub>) is injected into the SCR bed and any excess ammonia that is not consumed in the reaction is emitted from the stack. These ammonia emissions are commonly referred to as ammonia slip.

Air pollution emission rates for PSE Sumas are based on emission factors derived from source testing, gas sulfur content values, and CEMS measurements. OAC 304h contains maximum emission limits for NO<sub>x</sub>, CO and NH<sub>3</sub>. These limits represent the facility's federally enforceable potential to emit (PTE) for these pollutants.

Toxic air pollutant (TAP) and hazardous air pollutant (HAP) emission rates from the combustion turbine are based on heat input in millions of British thermal units per hour (MMBtu/hr) and emission factors (pound pollutant per MMBtu) from EPA's AP-42 Section 3.1, Stationary Gas Turbines.



**Figure 3 PSE Sumas Process Flow Diagram**

**2.2.2 Emergency Generator (EU-2)**

Emissions of from the Cummins Turbo 500 kW diesel-fired emergency generator are based on fuel use rates as heat input (MMBtu) and emission factors from EPA’s AP-42 Section 3.4, Large Uncontrolled Stationary Diesel Engines. OAC 304h limits generator operation to no more than 132 hours per year.

**2.3 Emissions Inventory**

**2.3.1 Potential to Emit**

PSE Sumas has submitted their annual potential emissions for both criteria and toxic pollutants with their renewal application. These potential emissions are shown in Tables 2-1 and 2-2.

**Table 2-1 Potential Emissions, criteria pollutants and greenhouse gases, tons per year**

NOx	CO	SO2	PM	PM2.5	VOC	CO2e <sup>1</sup>
75	52	11	27	21	10	570,204

**Table 2-2 Potential Emissions, hazardous air pollutants, tons per year**

Acetaldehyde	Ethyl benzene	Propylene Oxide	Benzene	Formaldehyde	Toluene	Xylenes
0.20	0.16	0.14	6E-02	3.5	0.65	0.32

<sup>1</sup> CO2e was calculated using the same EFs and methodology as Part 98 GHG reporting. VOCs were calculated using AP-42. The potential turbine run hour total was adjusted down to 8245 hours due to the 75 TPY limit for NOx.

**2.3.2 Actual Emissions**

Table 2-3 shows the fuel used annually by the combustion turbine and the emergency generator. The turbine is permitted to use only natural gas as a fuel. Table 2-4 shows the criteria air pollutant emissions, and Table 2-5 shows the two highest toxic air pollutant emissions from the facility.

**Table 2-3 Fuel Use Data**

	2015	2016	2017	2018	2019
Natural gas (million scf)	4877	3205	2126	2210	3832
Diesel (1000 gal)	2.30	0.35	3.18	1.48	0.60

**Table 2-4 Criteria Air Pollutant Emissions and Greenhouse gases, Tons per Year**

YEAR	PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>x</sub>	VOC	CO	CO <sub>2e</sub>
2015	11	6	44	0	0	291,067
2016	10	4	30	0	0	200,956
2017	6	2	20	0	1	130,939
2018	7	2	21	0	3	147,642
2019	11	3	34	0	3	252,592

**Table 2-5 Hazardous Air Pollutant Emissions, Pounds per Year**

	2015	2016	2017	2018	2019
Benzene	63	43	28	29	51
Formaldehyde	3711	2533	1651	1726	2996
Acetaldehyde	209	143	93	97	169
Ethylbenzene	167	114	74	78	135
Propylene Oxide	116	104	67	70	122
Xylenes	340	228	149	156	270
Toluene	680	464	302	316	548

**2.4 Permitting History**

On January 10, 1991, NWCAA issued OAC 304 approving construction of the facility comprised of a 67 MW combined cycle, natural gas-fired combustion turbine with a heat recovery steam generator. NO<sub>x</sub> emissions are controlled with steam injection to the turbine

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combustion section, and SCR for post combustion control. NO<sub>x</sub> emissions are monitored with a continuous emission monitoring system (CEMS). The approval included post-combustion CO control using an oxidation catalyst bed and a CEMS to monitor CO emissions. The plant was built with the ability to send low pressure steam to the neighboring Socco Forest Products mill for kiln drying lumber. Ancillary equipment included a 3-cell cooling tower and a 500 KW diesel-fired emergency generator. Subsequently the NOC application was revised to expand the facility to 113 MW capacity, and an amended OAC 304 was issued on June 25, 1991. The plant commenced operation in April 1993. Since the initial issuance, OAC 304 has been revised as follows.

On August 8, 1996, NWCAA issued OAC 304a. This revision allowed an expansion of production capacity to 125 MW, and changed the NO<sub>x</sub> *concentration* limit (ppm) averaging time from hourly to 24-hours, removed the annual operating time limit on the combustion turbine, and the generator specifications were changed to the unit that was installed.

On November 17, 1997, NWCAA issued OAC 304b. This revision changed the averaging time on the NO<sub>x</sub> emission *rate* limit (lb/hr) from hourly to 24-hour. It also changed the NO<sub>x</sub> reporting requirement.

On August 3, 1998, NWCAA issued OAC 304c. This revision allowed removal of the oxidation catalyst bed and CO CEMS conditioned upon six months of continuous CO monitoring after the catalyst bed had been removed. The revision also added a 2-hour CO limit exemption during turbine startup. The company successfully demonstrated compliance with the CO limit for the required six-month period after removing the oxidation catalyst bed, and subsequently removed the CO CEM.

On March 27, 2009, NWCAA issued OAC 304d. This revision was requested by PSE which took ownership of the plant from Sumas Cogeneration Company on July 25, 2008. This ownership transfer triggered requirements for an acid rain permit because PSE is a regulated utility. The Acid Rain program triggered Title V applicability under Section 70.1 of 40 CFR 70, Section 72.70 of 40 CFR 72, and WAC 173-401-300(1)(a)(v). To better prepare the OAC for incorporation into the AOP, PSE requested a variety of OAC revisions including updating the OAC with new owner information; deleting obsolete and completed requirements (VOC and PM/PM<sub>10</sub> limits and their initial source test requirements); adding annual source testing for CO and ammonia; changing the 18.1 pound per hour NO<sub>x</sub> limit from a 24-hour to a calendar day average; and clarifying reporting requirements.

On July 31, 2009, NWCAA issued OAC 304e. This revision removed the text "pipeline grade" associated with a condition to combust only natural gas in the turbine. For clarification the revision included the definition of "natural gas" as found in 40 CFR 72.

On July 24, 2013, NWCAA issued OAC 304f. This revision removed the requirement to monitor the water to fuel ratio. This is allowed by 40 CFR 60 Subpart GG (see §60.334(a) and §60.334(b)) since the facility operates a NO<sub>x</sub> CEM system.

On August 27, 2015, NWCAA issued OAC 304g. This revision removed the requirement to correct measured NO<sub>x</sub> concentrations to ISO conditions. This is allowed by 40 CFR 60 Subpart GG (see §60.335(b)(1)) since the turbine is equipped with an add-on emission control device.

On April 23, 2020, NWCAA issued OAC 304h, the current OAC. This revision clarified that the NO<sub>x</sub> CEMS shall be installed, operated, and tested in accordance with NWCAA 367, NWCAA Appendix A and 40 CFR Part 60 Appendices B and F.

## **2.5 Compliance History**

One notice of violation (NOV) has been issued by the NWCAA to PSE since they took

ownership of the plant in 2008. NOV 4293 was issued on 7/12/2018 for failure to timely submit a stack test plan. No penalty was assessed.

**2.6 Stack Tests**

PSE Sumas performed the following stack tests since the last AOP renewal.

**Table 2-6 Stack Test History**

<b>Test Date</b>	<b>Pollutant</b>	<b>Emission Unit</b>	<b>Result</b>
2/16/16	CO, NH3	EU-1 (combined cycle turbine)	Pass
2/23/17	CO, NH3	EU-1 (combined cycle turbine)	Pass
2/14/18	CO, NH3	EU-1 (combined cycle turbine)	Pass
2/12/19	CO, NH3	EU-1 (combined cycle turbine)	Pass
6/2/20	CO, NH3	EU-1 (combined cycle turbine)	Pass

As shown above, the facility passed all stack tests. As discussed in detail in Section 7.5, NWCAA used this and other information to determine whether existing monitoring was sufficient.

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### **3 BASIS OF REGULATION APPLICABILITY**

#### **3.1 New Source Performance Standards (NSPS)**

##### **3.1.1 40 CFR 60 Subpart GG – Standards of Performance for Stationary Gas Turbines**

The provisions of Subpart GG are applicable to stationary gas turbines with a heat input at peak load equal to or greater than 10.7 gigajoules per hour (10 MMBtu/hr), based on the lower heating value of the fuel fired, for which construction, modification, or reconstruction is commenced after October 3, 1977. The combustion turbine at PSE Sumas has a heat input rating over the 10 MMBtu/hr NSPS threshold and was constructed after the applicability date of Subpart GG. Therefore subpart GG is applicable to the facility. Subpart GG includes specific NO<sub>x</sub> and SO<sub>2</sub> limits and requirements for demonstrating ongoing compliance.

The heat recovery steam generator (HRSG) is not subject to NSPS Subparts D, Da, Db or Dc (steam generating units) because PSE Sumas has no capacity to directly fire the HRSG with duct burners.

#### **3.2 National Emission Standards for Hazardous Air Pollutants (NESHAP)**

##### **3.2.1 40 CFR 63 Subpart YYYY—National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines**

Subpart YYYY establishes emission limitations and operating limitations for hazardous air pollutants from stationary combustion turbines located at major sources of HAP emissions. Under 40 CFR 63, a major source is one that has the potential to emit 10 tons or more per year of any single HAP or 25 tons per year or more of any combination of HAPs. Subpart YYYY does not apply to PSE Sumas because it does not meet the potential to emit any single HAP or total combination of HAPs that would make it a major source under 40 CFR 63.

##### **3.2.2 40 CFR 63 Subpart ZZZZ: National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines**

Subpart ZZZZ establishes emission and operating limitations for HAP emitted from stationary reciprocating internal combustion engines (RICE) located at major and area sources of HAP emissions. PSE Sumas is an area source of HAP, and the Cummins diesel generator is a RICE, therefore Subpart ZZZZ applies to the facility.

#### **3.3 Acid Rain Program**

The acid rain program includes permits, an allowance system, sulfur dioxide opt-ins, continuous emission monitoring, excess emissions, and appeal procedures, described in 40 CFR Parts 72, 73, 74, 75, 77, and 78. The acid rain program is authorized under Title IV of the Federal Clean Air Act with the purpose of reducing SO<sub>2</sub> and NO<sub>x</sub> emissions from utility electric generating plants. These reductions will, in turn, reduce the adverse health and ecological impacts associated with acidic deposition. The EPA promulgated the acid rain provisions in 1993. The combustion turbine (EU-1) at PSE Sumas is an “affected unit” as defined in the acid rain program. The applicable requirements are found in Section 6 of the air operating permit.

#### **3.4 Compliance Assurance Monitoring (CAM)**

The requirements of Compliance Assurance Monitoring are contained in 40 CFR 64. They

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apply to a pollutant-specific emissions unit (PSEU)<sup>2</sup> at a major source that is required to obtain a part 70 or 71 permit provided the unit satisfies all criteria as delineated in 40 CFR 64.2(a)(1)-(3). The PSEU must meet all of the following criteria:

- is subject to an emission limitation or standard,
- uses a control device to achieve compliance, and
- has a potential pre-control emissions greater than or equal to the major source threshold for the pollutant.

The only unit at PSE Sumas with a control device is the combustion turbine (EU-1), which is equipped with steam injection and selective catalytic reduction (SCR) to control NO<sub>x</sub>. Emissions of other pollutants are not controlled by a control device. Since the turbine is the only unit with controls, and it's only controlled for NO<sub>x</sub>, further evaluation of CAM applicability is only needed for NO<sub>x</sub> at the turbine.

The combustion turbine (EU-1) is exempted from the CAM rule by §64.2(b)(1)(vi)<sup>3</sup> because ongoing compliance is determined in the Part 70 permit with a continuous emissions monitor (CEM).

### **3.5 Risk Management Plan (RMP)**

The goal of 40 CFR 68 – Chemical Accident Prevention Provisions, commonly known as Risk Management Plan provisions, is to prevent accidental releases of substances that can cause serious harm to the public and the environment from short-term exposures and to mitigate the severity of releases that do occur. For example, if a tank, or pipe at the facility contains hazardous or flammable substances listed in §68.130 in an amount above the “threshold quantity” specified for that substance, the facility operator is required to develop and implement a risk management program.

Although the facility initially used anhydrous ammonia to support operation of the SCR, PSE has since substituted an aqueous ammonia solution with an ammonia concentration of 19% by volume. The site de-registered from the RMP and PSM plans in December 2009. Because the current operation involves aqueous ammonia with a concentration less than 20%, the facility is not subject to RMP requirements (40 CFR 68.130).

### **3.6 New Source Review (NSR)**

New Source Review (NSR) requires stationary sources of air pollution to obtain approval prior to commencing construction. There are two types of NSR permitting requirements. Major NSR permitting is required under 40 CFR 52 as Prevention of Significant Deterioration (PSD) permitting. These permits are required for large “major” sources that are new or

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<sup>2</sup> The term “PSEU” means an emissions unit considered separately with respect to each regulated air pollutant. Also the term “control device” means equipment, other than inherent process equipment, that is used to destroy or remove air pollutants prior to discharge to the atmosphere.

<sup>3</sup> The requirements of this part shall not apply to any of the following emission limitations or standards. Emission limitations or standards for which a part 70 or 71 permit specifies a continuous compliance determination method, as defined in §64.1. The exemption provided in this paragraph (b)(1)(vi) 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, this part would apply to the control device and capture system, but not to the remaining elements of the coating line, such as raw material usage).

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modified as defined in the rule. The PSE Sumas facility does not have a PSD permit because minor NSR permitting during original construction (OAC 304) included federally enforceable emissions limits that effectively prevent the facility from being a “major” source under Part 52.

Minor NSR permitting is required under Section 300 of the NWCAA Regulation and issued as an “Order of Approval to Construct” (OAC). The NWCAA issues such permits for non-major sources that are new or modified as defined in the rule. PSE Sumas has one OAC. OAC 304 was issued for original construction of the plant in 1991. This OAC has been revised numerous times to its current revision, OAC 304h, which has been incorporated into the air operating permit. Section 2 of this document contains a complete NSR permit history for PSE Sumas.

### **3.7 Greenhouse Gas Regulation (GHG)**

Greenhouse gases (GHG) are gases that contribute to climate change by absorbing heat emitted from the earth. The greenhouse gases recognized by EPA and Ecology are: carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFC), perfluorocarbons (PFC), and sulfur hexafluoride (SF<sub>6</sub>). HFC are a class of greenhouse gases primarily used as refrigerants, consisting of hydrogen, fluorine, and carbon.

PSE Sumas is required to meet federal and state greenhouse gas emission requirements. Because federal GHG rules do not meet the criteria that define “applicable requirements” under Title V (WAC 173-401-200(4)), they are not included in the air operating permit. However, the state GHG rules do meet the definition of Title V “applicable requirements” and therefore are incorporated into the permit.

#### **3.7.1 40 CFR 98, Federal Mandatory Greenhouse Gas Emission Inventory Regulation**

This regulation applies to PSE Sumas due to its GHG emission levels and also the type of facility PSE Sumas is. The rule requires annual GHG inventories and reporting starting in calendar year 2010, with reports due to EPA by no later than March 31 of the following year. This regulation is implemented in its entirety by the EPA. This regulation is excluded from appearing in a Title V air operating permit because it does not contain applicable requirements under the Title V program.

#### **3.7.2 Chapter 173-407 WAC, Carbon Dioxide Mitigation Program, Greenhouse Gases Emissions Performance Standard and Sequestration Plans and Programs for Thermal Electric Generating Facilities, Part I WAC 173-407-010 through -070, and Part II, WAC 173-407-100 through -320.**

In accordance with 173-407-120 (4)(c), this regulation applied to PSE Sumas when the facility was purchased by PSE on June 25, 2008. The rule applies because PSE Sumas is a fossil-fueled thermal electric generating facility with station-generating capability of more than 25 megawatts of electricity.

Part II of the rule applies to PSE Sumas and includes a GHG emissions performance standard of less than or equal to 1,100 pounds of CO<sub>2</sub> equivalent per megawatt-hour generated on a calendar year average basis. The rule specifies that the GHG emissions performance standard is based on total emissions of carbon dioxide (CO<sub>2</sub>), nitrous oxide (N<sub>2</sub>O) and methane (CH<sub>4</sub>), each weighted based upon their global warming potential (GWP = 1.0 for CO<sub>2</sub>, 21 for CH<sub>4</sub>, and 310 for N<sub>2</sub>O). The resulting sum is expressed in metric tons of carbon dioxide equivalents (CO<sub>2</sub>e). PSE Sumas has opted to demonstrate ongoing compliance with this performance standard as follows.



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**3.7.2.1 *Carbon Dioxide (CO<sub>2</sub>)***

Carbon Dioxide (CO<sub>2</sub>) emissions are estimated through fuel carbon content monitoring, emission factors developed during stack testing using Ecology or EPA approved methods, and through other methods meeting the requirements of 40 CFR Sections 75.10 and 75.13 and 40 CFR Part 75 Appendix G. Part 75 requires that fuel consumption in the combustion turbine be continuously monitored using certified volumetric flow meters that are certified initially and have ongoing QA requirements delineated in 40 CFR Part 75, Appendix D to assure accuracy.

PSE Sumas completed four consecutive quarterly stack tests for CO<sub>2</sub> during the 2009 calendar year using Method 3A – *Determination of Oxygen and Carbon Monoxide Concentrations in Emissions from Stationary Sources*. Results from testing are used to determine emission factors for CO<sub>2</sub> based on natural gas fuel consumption rates.

**3.7.2.2 *Nitrous Oxide (N<sub>2</sub>O) and Methane (CH<sub>4</sub>)***

Nitrous Oxide (N<sub>2</sub>O) and methane (CH<sub>4</sub>) emissions are estimated through the use of specific emission factors developed during stack testing using Ecology or EPA approved methods. Testing is required at various loads and during four separate test periods spaced evenly throughout first year of operation under the rule. PSE Sumas completed four consecutive quarterly stack tests for N<sub>2</sub>O and CH<sub>4</sub> during the 2009 calendar year using EPA Method 320 - *Measurement of Vapor Phase Organic & Inorganic Emissions by Extractive Fourier Transform Infrared (FTIR) Spectrometry* with the results being used to determine emission factors for those GHGs.

**Chapter 173-441 WAC, Reporting of Emissions of Greenhouse Gases**

Chapter 173-441 WAC, "Reporting of Emissions of Greenhouse Gases", is a mandatory greenhouse gas reporting rule for:

- Suppliers that supply applicable fuels sold in Washington state of which the complete combustion or oxidation would result in at least 10,000 metric tons of carbon dioxide annually; or
- Any listed facility that emits at least 10,000 metric tons of carbon dioxide equivalents (CO<sub>2</sub>e) of greenhouse gases annually in the state.

Chapter 173-441 WAC was adopted by Ecology on December 1, 2010 and became effective on January 1, 2011. This regulation applies to PSE Sumas due to the fact that it emits at least 10,000 metric tons of CO<sub>2</sub>e of greenhouse gases per year. For 2013 and 2014, PSE Sumas reported about 262,000 tons and 230,000 tons of CO<sub>2</sub>, respectively. Similar to the federal reporting rule under 40 CFR 98, the rule requires annual GHG inventories due to Ecology by no later than March 31 of the following year beginning for calendar year 2012. This regulation is implemented in its entirety by Ecology. Because the statutory authority for chapter 173-441 WAC was the state Clean Air Act (chapter 70.94 RCW), it is considered an applicable requirement under the air operating permit program (WAC 173-401-200(4)); as such, it is included in the AOP.

## **4 GENERAL ASSUMPTIONS OF THE PERMIT**

### **4.1 Permit Content**

Applicable requirements that were satisfied by a single past action on the part of the source are not included in the permit, but are discussed in the statement of basis. An example would be performance testing to demonstrate compliance with applicable emission limitations as a requirement of initial startup. Also, regulations that require action by a regulatory agency, but not of the regulated source, are not included as applicable permit conditions.

### **4.2 One-Time Requirements**

The following actions were noted as having been completed as required by Notice of Construction Approvals or Federal New Source Performance Standards:

- Initial NSPS notifications and performance testing and initial performance testing required under OAC 304 were done long before the facility was purchased by Puget Sound Energy.
- PSE Sumas notified NWCAA that the Sumas Cogeneration Company, L.P. was transferring ownership of the gas-fired electrical cogeneration facility to Puget Sound Energy in compliance with Section 323.3 of the NWCAA Regulation.
- PSE Sumas submitted a Certificate of Representation to EPA on October 15, 2008 pursuant to 40 CFR 72.24.
- PSE Sumas submitted a CEMS Monitoring Plan for the Sumas Generating Station, pursuant to 40 CFR 75.53 on December 30, 2008.
- PSE Sumas provided notification of initial certification testing of the monitoring system at the Sumas Generating Station under the Acid Rain Rules, pursuant to 40 CFR 75.61(a)(1) on December 30, 2008. Testing was to take place from January 20 through 26 of 2009.
- PSE Sumas submitted an Acid Rain Permit application to EPA on May 28, 2009 pursuant to 40 CFR 72.30 and 72.31.
- PSE Sumas submitted an air operating permit application to NWCAA on July 21, 2009. Additional information was submitted in response to NWCAA request on August 20, 2009.
- PSE Sumas performed a series of four, equally-spaced quarterly tests for determination of the GHG gases N<sub>2</sub>O and CH<sub>4</sub> and establishment of emission factors as required by WAC 173-407-120, -140, and -230, and Section 367 and Appendix A of the NWCAA Regulation. Tests were performed during 2009, with the final testing performed on November 5<sup>th</sup> and 6<sup>th</sup>, 2009.
- PSE Sumas submitted a request for a new source review determination for the Aqueous Ammonia Conversion Project. The project includes converting the existing anhydrous ammonia storage, handling and injection system to an aqueous ammonia system. NWCAA determined that the project would not require a NOC application, so long as the facility continues to comply with existing ammonia emission limits, and the project is completed by no later than March 7, 2011. The project has been completed.

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### **4.3 Federal Enforceability**

Federally enforceable requirements are terms and conditions required under the Federal Clean Air Act (FCAA) or under any of its promulgated regulations. NWCAA and state regulations may become federally enforceable by formal approval and incorporation into the State Implementation Plan (SIP). Federally enforceable requirements are enforceable by the EPA and citizens. All applicable requirements in the permit including standard terms and conditions, generally applicable requirements, and specifically applicable requirements are federally enforceable unless they are identified in the permit as enforceable only by the state. Two different versions (identified by the date) of the same regulatory citation may apply to the source if SIP approval/delegation lags behind changes made to the Washington Administrative Code (WAC) or to the NWCAA Regulation. For Washington Administrative Code (WAC) regulations, the date listed in parenthesis in the air operating permit represents the State Effective date. For NWCAA regulations, the date represents the most recent NWCAA Board of Directors adoption date, which is identified as the "Passed" or "Amended" date in the NWCAA Regulation. The date associated with an OAC or PSD permit represents the latest issuance date of that order. For Federal rules, the date is the rule's most recent promulgation date.

Chapter 173-401 WAC is not federally enforceable although the requirements of this regulation are based on federal requirements for the air operating permit program. Upon issuance of the permit, the terms based on Chapter 173-401 WAC will become federally enforceable for the source.

### **4.4 Gap Filling and Sufficiency Monitoring**

Title V of the Federal Clean Air Act is the basis for the EPA's 40 CFR 70, which is the basis for the State of Washington air operating permit regulation, Chapter 173-401 WAC. Title V requires that all air pollution regulations applicable to the source be called out in the AOP for that source. Title V also requires that each applicable regulation be accompanied by a federally enforceable means of "reasonably assuring continuous compliance." Title V, 40 CFR 70, and WAC 173-401-615 all contain a "gap-filling" provision that enables NWCAA to add monitoring where no monitoring is present<sup>4</sup>. 40 CFR Part 70.6(c)(1) and WAC 173-401-630(1) contain authority to address situations where monitoring exists, but is deemed to be insufficient. NWCAA relied upon these authorities to add monitoring where needed to the AOP.

The majority of cases where monitoring needed to be added were older regulations and permits that contain no monitoring. For example, NWCAA used its gap-filling authority to

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<sup>4</sup> WAC 173-401-615(1) Monitoring. Each permit shall contain the following requirements with respect to monitoring:

(a) 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 FCAA;

(b) Where the applicable requirement does not require periodic testing or instrumental or noninstrumental 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 subsection (3) of this section. Such monitoring requirements shall assure use of terms, test methods, units, averaging periods, and other statistical conventions consistent with the applicable requirement. Recordkeeping provisions may be sufficient to meet the requirements of this paragraph; and

(c) As necessary, requirements concerning the use, maintenance, and, where appropriate, installation of monitoring equipment or methods.

add monitoring for the 20% visible emission standard, NWCAA 451.1. In any term where gap-filling has taken place, the regulatory citation for that term will contain the words “directly enforceable” and the introductory paragraphs for the AOP table include the reference to the citation of the gap-filling requirement.

There may also be some limited cases where monitoring exists but was found to be insufficient. NWCAA can use its sufficiency monitoring authority (WAC 173-401-630(1)) to add monitoring in those cases. Sufficiency monitoring was not needed for the PSE Sumas AOP.

The type and frequency of monitoring added under the authority in WAC 173-401-615 and WAC 173-401-630(1) were set based on the following factors:

1. **Historical Compliance:** NWCAA reviewed the facility’s past compliance with the underlying requirement. This information helped inform the decision about monitoring frequency and stringency.
2. **Margin of Compliance:** The margin of compliance is a measure of whether the facility can easily achieve compliance with a requirement, or whether they operate close to the limit. NWCAA considered the facility’s margin of compliance for each underlying requirement in setting monitoring for that requirement.
3. **Variability of Process and Emissions:** Processes that vary their production rates and/or emissions over time require different monitoring from steady-state processes. NWCAA considered process and emission variability in setting monitoring.
4. **Environmental Impact of a Problem – Exceedances of some permit requirements have greater environmental consequences than others. For example, a problem that causes an exceedance of the ammonia emission limit in the SCR for a turbine could have a greater environmental impact than failing to use ultra-low sulfur diesel at an emergency generator. NWCAA considered the environmental impact of a problem in setting monitoring.**
5. **Clarity and Complexity – The requirements that apply to AOP facilities are numerous, varied, and can be complex. The greater the number, variety, and complexity of requirements, the harder it is for a facility to understand and comply. NWCAA’s goal is to write clear, concise permits the facilities can understand. To help achieve this goal, when possible, NWCAA aligned additional monitoring with monitoring that the facility is already performing. This approach required careful thought. NWCAA reviewed the monitoring the facility is already performing to see if it was adequate to stand-in as monitoring for the permit term, and only used it if deemed adequate.**

The following table lists where NWCAA used its gap-filling monitoring authority. No Directly enforceable – sufficiency provisions exist in the AOP.

**Table 4-1 AOP terms with Directly Enforceable gapfill provisions**

AOP Term	Description	Monitoring
4.1	Required monitoring reports	Reporting periods identified
4.2	Operation and maintenance	Monitor, keep records and report
4.3-4.6, 4.22	Nuisance	Procedure followed when complaints are received

AOP Term	Description	Monitoring
4.7-4.11	Fugitive PM	Procedure followed when complaints are received
4.12-4.16	Visible emissions	Visible emissions monitoring
4.17-4.21	Sulfur dioxide	Burn biomass or natural gas only
5.1	Use of natural gas	Recordkeeping to demonstrate natural gas used meets definition in 40 CFR 72.2
5.2	Turbine visual emissions	Action taken to monitor VE

**4.5 Future Requirements**

No pending requirements that may apply to PSE Sumas at a later date are included in the permit. Some requirements that are not applicable until triggered by an action, such as the requirement to file an application prior to constructing a new source, are addressed within the standard terms and conditions section of the permit. PSE certified in their renewal permit application that the facility will meet any future applicable requirements on a timely basis.

**4.6 Compliance Options**

Puget Sound Energy did not request emissions trading provisions or specify more than one operating scenario in the air operating permit application, therefore, the permit does not address these options as allowed under WAC 173-401-650. This permit does not condense overlapping applicable requirements (streamlining), nor does it provide any alternative emission limitations.

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## **5 PERMIT ELEMENTS, BASIS FOR TERMS AND CONDITIONS**

The PSE Sumas air operating permit is divided into the following sections:

- Permit Information
- Attest
- Table of Contents
- Section 1 Emission unit Identification
- Section 2 Standard Terms and Conditions
- Section 3 Standard Terms and Conditions for NSPS
- Section 4 Generally Applicable Requirements
- Section 5 Specifically Applicable Requirements
- Section 6 Acid Rain Permit

### **5.1 Permit Information**

The Information Page of the permit identifies the source and provides general information about the permit, the responsible corporate official, and the agency personnel responsible for permit preparation, review and issuance.

### **5.2 Attest**

The Attest Page provides authorization for the source to operate under the terms and conditions contained in the permit.

### **5.3 Section 1 Emission Unit Identification**

Section 1 lists emission units, emission points and control devices present at PSE Sumas. Additional information about the facility may be found in the operating permit application and in supplementary files.

### **5.4 Section 2 Standard Terms and Conditions**

The Standard Terms and Conditions section of the permit contains administrative requirements and prohibitions that do not have ongoing compliance monitoring requirements. The citations giving legal authority to the Standard Terms and Conditions are provided in the section. At times, requirements are paraphrased. In this case the language of the cited regulation takes precedence over the paraphrased summary. For understanding and readability, the terms and conditions have been grouped by function. Similar requirements from State and NWCAA regulations are grouped together where possible. There are several requirements included that are not applicable until triggered. Examples of these would be the requirement to file a "Notice of Construction and Application for Approval" (NOC).

### **5.5 Section 3 Standard Terms and Conditions for NSPS and NESHAP**

The Standard Terms and Conditions for NSPS and NESHAP contain applicable requirements from 40 CFR 60 Subpart A - General Provisions and 40 CFR 63 Subpart A - General Provisions, respectively.

### **5.6 Sections 4 and 5 Generally and Specifically Applicable Requirements**

Requirements that limit emissions and broadly apply through the facility are identified in Section 4 - Generally Applicable Requirements. Requirements that limit emissions and apply specifically to emission units at PSE Sumas are identified in Section 5 - Specifically

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Applicable Requirements. Both section tables are organized by pollutant type for better readability. The first column contains the term number followed by the pollutant type. The second column identifies the regulatory citation. The third column provides a brief description of the applicable requirements for informational purposes and is not enforceable. The fourth column identifies monitoring, recordkeeping and reporting requirements in accordance with WAC 173-401-605(1), -615(1) & (2) and is enforceable except that insignificant emission units are exempt from all MR&R. Test methods associated with each applicable requirement or in accordance with WAC 173-401-615(1)(a) are included in this column.

Many generally applicable requirements do not specify test and/or monitoring methods within the text of the regulation or statute even though WAC 173-401-615 requires the permit to feature monitoring and recordkeeping adequate to demonstrate compliance with such requirements. In these cases, site-specific monitoring methods (gap filling) were developed as discussed in Section 4.4 above.

Sulfur emission limits of all units contained in the Generally and Specifically Applicable Requirements section of the permit are inherently met if the turbines burn only natural gas containing less than 20 grain/100 SCF sulfur. This is reflected in the July 2004 NSPS Subpart GG revisions which allow the source to keep documentation from its natural gas supplier that the fuel has less than 20 grains/100 SCF sulfur in lieu of testing or perform initial testing demonstrating that the natural gas meets the definition.

Requirements pertaining to operation and maintenance, nuisance, fugitive emissions and odor may be met through adherence to PSE Sumas internal operation and maintenance (O&M) plan and a commitment to timely complaint response and follow-up corrective action. It should be noted that PSE Sumas O&M plan is not included as part of their air operating permit.

## **5.7 Section 6 Acid Rain Permit**

The acid rain permit and certificate of representation for the combustion turbine (EU-1) at PSE Sumas are contained in this section of the air operating permit.

**6 INSIGNIFICANT EMISSIONS UNITS**

Some categorically exempt insignificant emission units (IEU) as defined in WAC 173-401-532 are present at PSE Sumas and are not listed in the permit. Emission units at PSE Sumas that have been determined to be insignificant on the basis of size or production rate, as defined in WAC 173-401-533 are listed in Table 6-1, and are not listed in the permit.

**Table 6-1 Insignificant Emission Units**

Emission unit	Description	Why IEU	Citation
Cooling tower	Non-contact 3-cell cooling tower	Processing non-contact cooling water	WAC 173-401-532(121)
Diesel storage tanks	One 1,000 gallon tank	Operation, loading and unloading of VOC storage tanks (including gasoline storage tanks), ten thousand gallons capacity or less, with lids or other appropriate closure, vapor pressure not greater than 80mm Hg at 21°C	WAC 173-401-533(2)(c)
Natural gas piping	Fuel supply line	Less than threshold quantities	WAC 173-401-530
Aqueous ammonia storage tank	One 12,000 gallon tank	Less than threshold quantities	WAC 173-401-530
Misc. wastewater collection pumps	50-150 gallons each	Less than threshold quantities	WAC 173-401-530
Facility operation and maintenance	Normal operation and maintenance, exclusive of fuel, associated with the operation of a combustion turbine	Less than threshold quantities	WAC 173-401-530
General welding	Welding for general maintenance and construction	Less than one ton of welding rod/day	WAC 173-401-533 (2)(i)
Emergency Generator cooling system	Non-contact, antifreeze based cooling system for generator	Not in contact with process streams, not using chromium-based corrosion inhibitors	WAC 173-401-533 (2)(m)
Space and hot water heaters	Natural gas or propane fired space heaters and hot water heaters.	Less than 5 MMBtu/hour heat input	WAC 173-401-533 (2)(r)



**Puget Sound Energy, Sumas Generating Station, Statement of Basis for AOP 021R2M1**

Final, February 28, 2023

Emission unit	Description	Why IEU	Citation
Storage, loading and unloading of distillate fuels	Distillate fuels have very low vapor pressures.	Vapor pressure less than 5 mm Hg @ 21°C (0.1 psia )	WAC 173-401-533 (2)(t)
Site drainage retention pond	Storm water and oily water collection system	Industrial Stormwater General Permit issued by Ecology. Used for removing suspended solids and oil.	WAC 173-401-533 (3)(d)

## **7 PUBLIC DOCKET**

Copies of PSE Sumas air operating permit, permit application and any technical support documents are available at the following locations:

Online:

[www.nwcleanairwa.gov](http://www.nwcleanairwa.gov)

Office:

Northwest Clean Air Agency  
1600 South Second Street  
Mount Vernon, WA 98273-5202

360-428-1617 (call for an appointment to review)

Note that during the COVID-19 pandemic, the NWCAA office may be closed. During this time, copies of the documents will be sent to the requestor upon request.

No comments were received during the public comment period. EPA notified NWCAA via email on 4/14/2021 that they do not plan to review the proposed permit action and would not object to its issuance.

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## **8 DEFINITIONS AND ACRONYMS**

Definitions are assumed to be those found in the underlying regulation. A short list of definitions has been included to cover those that may not have been previously defined.

An "applicable requirement" is a provision, standard, or requirement in any of the listed regulations or statutes as it applies to an emission unit at a stationary source.

An "emission unit" is any part or activity of a stationary source that emits or has the potential to emit pollutants.

"Permit" means for the purposes of the air operating permit program an air operating permit issued pursuant to Title V of the 1990 Federal Clean Air Act.

"Technology-Based Emission Standard" means a standard, the stringency of which is based on determinations of what is technologically feasible considering relevant factors.

"State" means for the purposes of the air operating permit program the NWCAA or the Washington State Department of Ecology.

The following is a list of Acronyms and definitions used in the Air Operating Permit and/or Statement of Basis:

AOP.....	Air Operating Permit
ASTM.....	American Society for Testing and Materials
CEMS.....	Continuous Emissions Monitoring System
CFR .....	Code of Federal Regulations
BACT .....	Best Available Control Technology
BHP .....	Brake horse power
Btu.....	British Thermal Units
CO .....	carbon monoxide
dscf.....	dry standard cubic feet
FCAA .....	Federal Clean Air Act
GHG .....	Greenhouse Gas
ISO .....	International Organization for Standardization
KW .....	Kilowatt
MMBtu .....	Million British Thermal Units
MR&R .....	monitoring, recordkeeping and reporting
MW .....	Megawatt
NH <sub>3</sub> .....	ammonia
NO <sub>x</sub> .....	nitrogen oxides
NSPS .....	New Source Performance Standard
NSR.....	New Source Review
NWCAA .....	Northwest Clean Air Agency
OAC .....	Order of Approval to Construct

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PSE .....Puget Sound Energy  
ppmvd .....parts per million by volume (dry basis)  
ppmw .....parts per million by weight  
RCW .....Revised Code of Washington  
scf.....standard cubic foot  
SCR.....Selective catalytic reduction  
SIP.....State Implementation Plan  
STP .....standard temperature and pressure (14.7 psia and 60°F)  
SO<sub>2</sub> .....sulfur dioxide  
VE.....Visual emissions  
WAC.....Washington Administration Code  
WDOE.....Washington State Department of Ecology