Statement of Basis
Centrio

Purpose of this Statement of Basis

This document summarizes the legal and factual basis for the draft permit conditions in the air operating permit to be issued to under the authority of the Washington Clean Air Act, Chapter 70.94 Revised Code of Washington (RCW), Chapter 173-401 of the Washington Administrative Code (WAC), and the Puget Sound Clean Air Agency (previously known as Puget Sound Air Pollution Control Agency (PSAPCA)) Regulation I, Article 7. Unlike the permit, this document is not legally enforceable. It includes references to the applicable statutory or regulatory provisions that relate to Centrio (formerly Enwave Seattle and Seattle Steam) air emissions, and provides a description of Centrio activities, including a short compliance history.

Source Description

Why Centrio is an Air Operating Permit Source

The Centrio is subject to the requirement to obtain an air operating permit because it is a "major source" as defined in the federal and state operating permit regulations [Title V of the federal Clean Air Act Amendments of 1990 and its implementing regulation 40 CFR Part 70, and RCW 70.94.161 and its implementing regulation, Chapter 173-401 WAC]. A major source has the potential to emit more than 100 tons per year of any criteria pollutant (such as CO, SO_2, NO_X, VOC, particulate matter, etc.) or 10 tons per year or more of any single hazardous air pollutant listed in Section 112(b) of the federal Clean Air Act (such as hydrochloric acid), or 25 tons per year or more of any combination of hazardous air pollutants.

General Description

Centrio has produced general heating steam for buildings in the downtown Seattle area for over 100 years. The facility operates and maintains four boilers for steam production; 24 hours per day, 365 days per year. Originally the facility used coal as its primary fuel. Coal was replaced by fuel oil, then by natural gas, as the primary fuel, with No. 6 "residual" oil used as the backup fuel.

The four water tube boilers consist of a Riley-Stoker installed in 1955, Garrett & Shaffer installed in 1960, Combustion Engineering (A) installed in 1970, and Combustion Engineering (D) installed in 1974. All fire natural gas with residual oil used during periods of natural gas curtailment and during training exercises. Natural gas is brought to the facility by pipeline and is not stored on site. Residual oil is brought to the site by truck and is stored on site in two underground storage tanks (252,000 and 126,000 gallon capacity).

When firing residual oil the exhaust gases from the Riley-Stoker and Garrett & Shaffer boilers are routed to pass through multi-clones that remove particulate matter before discharge to a common stack (silver). The multi-clone particulate control system was originally installed to control particulate matter emitted when the facility was fired by

coal. The Combustion Engineering boilers D and A have no exhaust gas pollution control equipment and discharge to a common stack (black).

Centrio is allowed to burn residual oil for a maximum of 31 days each heating season subject to specific conditions approved in Board Resolution 893 as an alternative means of compliance by the Puget Sound Clean Air Agency Board of Directors on September 9, 1999 (see discussion of General Regulatory Order 7740 on Page 4 below).

By Board Resolution No. 893, adopted September 9, 1999, and approving an alternate means of compliance, Centrio is allowed to burn residual oil for a maximum of 31 days each heating season subject to certain conditions (See Section I.B.1. of the permit).

The Centrio facility has a number of minor emission sources which include: a diesel-fired engine/generator for emergency power production, a diesel fuel storage tank (250 gallon) and residential-sized gas-fired water heaters.

Emission Units That Have Specific Requirements in the Air Operating Permit

Emission Unit #1 (EU-1) Steam Generating Process

This emission unit consists of the following boilers used for generating steam at the Centrio:

Boiler No.	Manufacturer	Stack (vented to)	Rated Capacity, lb/hr steam	Typical Operating Maximum	Fuels	Year Installed	Controls
1	Garrett & Shaffer #861 Water Tube	Silver	150,000 @ 140 psig (210 MMBtu/hr†)	100,000 (140 MMBtu/hr)	Nat Gas/Res Oil	1960‡	Multiclone (installed 1962)
2	Riley Stoker #1899 Water Tube	Silver	200,000 @ 140 psig (280 MMBtu/hr†)	150,000 (210 MMBtu/hr)	Nat Gas/Res Oil	1955‡	Multiclone (installed 1962)
3	Comb.-Engr. (A) #110511 Water Tube (Standby)	Black	170,000 @ 140 psig (238 MMBtu/hr†)		Nat Gas/Res Oil	1974	
4	Comb.-Engr. (D) #110272 Water Tube	Black	120,000 @ 140 psig (168 MMBtu/hr†)		Nat Gas/Res Oil	1970	

Notes:

† The boilers are large enough that the Subpart Db of the New Source Performance Standards in Title 40, Code of Federal Regulations, Part 60 would apply, except that no construction[1], modification[2], or reconstruction[3], as defined in 40 CFR 60, has occurred after the June 19, 1984 effective date of Subpart Db.

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1 *Construction* means fabrication, erection, or installation of an affected facility.

2 *Modification* means any physical change in, or change in the method of operation of, an existing

‡ Boiler No. 2 was installed before the Puget Sound Clean Air Agency was established, before there was a requirement for pre-construction approval.

Permit History

Original Permit

An air operating permit application was received by the Puget Sound Clean Air Agency from Centrio on June 2, 1995 pursuant to WAC 173-401-500(3). The application was acknowledged to be complete in an October 27, 1995 letter from the Puget Sound Clean Air Agency. The draft air operating permit was published on December 8, 1997; the 30-day comment period expired January 7, 1998. The air operating permit had to be redrafted and republished due to the issuance of General Regulatory Order 7740. The Puget Sound Clean Air Agency "air operating permit template" had undergone significant changes by this time, calling for an extensive revision to not only the content, but also the format of the air operating permit. Draft was due to complete February 2001.

Administrative Amendment 1

On July 28, 2004, Seattle Steam submitted an application to change the Responsible Official from James G. Young to Stanley Gent, P.E. Administrative Amendment 1 to make this change was issued on March 30, 2005.

Administrative Amendment 2

On February 18, 2015, Miller Nash Graham & Dunn submitted a letter advising the Agency of a change of ownership, and requested our records be changed to reflect the new company name, Enwave Seattle. This change was made.

Administrative Amendment 3

On March 16, 2017, Seattle Steam submitted a request to change the Responsible Official from Stanley Gent to Brandon Oyer. This change was made.

Administrative Amendment 4

On November 1, 2018, Enwave submitted a request to change the Responsible Official

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facility which increases the amount of any air pollutant (to which a standard applies) emitted into the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) into the atmosphere not previously emitted.

3 *Reconstruction* means the replacement of components of an existing facility to such an extent that:

(1) The fixed capital cost of the new components exceeds 50 percent of the fixed capital cost that would be required to construct a comparable entirely new facility, and

(2) It is technologically and economically feasible to meet the applicable standards set forth in 40 CFR 60.

from Brandon Oyer to Clarence Clipper. This change was made.

Administrative Amendment 5

On February 26, 2023 Centrio submitted a request to change the Responsible Official to Jim Lodge. The facility name is also now Centrio instead of Enwave, so that change was also made.

Notice of Construction and Regulatory Order History

Installation of the Riley-Stoker and Garrett & Shaffer Boilers predate the Puget Sound Clean Air Agency. While the Puget Sound Clean Air Agency has never issued Orders of Approval for construction of these emission units, they do have to comply with all the "general" Puget Sound Clean Air Agency regulations.

Notice of Construction (NOC) Order of Approval No. 106, issued July 3, 1969 for the installation of a Combustion Engineering (D) Boiler. The Puget Sound Clean Air Agency issued this NOC approval with no emission unit-specific approval conditions.

NOC Order of Approval No. 1066, issued September 25, 1973 for the installation of a Combustion Engineering (A) Boiler. This approval was issued with no emission unit-specific approval conditions.

General Regulatory Order No. 6517 issued May 8, 1997 for an alternate means of compliance was superceded and canceled by General Regulatory Order No. 7740.

General Regulatory Order No. 7740 issued September 9, 1999 for an alternate means of compliance. Puget Sound Clean Air Agency Regulation I, Article 9.04, Opacity Standards for Equipment with Continuous Opacity Monitoring Systems, requires emission monitoring for all fuel burning equipment (excluding equipment burning distillate oil or gaseous fuel) rated at 100 million Btu per hour or greater. This requirement affects Centrio. Centrio requested an alternate means of compliance, as allowed by Puget Sound Clean Air Agency Regulation I, Section 3.23, to operate its boilers without the installation of continuous monitors. This was because Seattle Steam uses less than 3,822,000 gallons of No. 6 oil (residual oil) as backup fuel for per year, which is equivalent to about 30 days per year of operation. The Puget Sound Clean Air Agency Board of Directors approved the alternate means of compliance as Board Resolution No. 893 on September 9, 1999, and the Puget Sound Clean Air Agency has submitted such approval to the Washington Department of Ecology for inclusion in the State Implementation Plan (SIP).

Compliance History

During the past five years, the Puget Sound Clean Air Agency conducted seven compliance inspections of Centrio. The Agency has not issued any notices of violation during this time, but has issued the following Compliance Status Reports (CSRs).

January 25, 2001: CSR requesting clarification on statement that established correlation factors "in process of being incorporated into O/M plan" as required by Condition 5 of

General Regulatory Order 7740. Response indicated that operating procedures were amended to provide new operating guidelines in early December of 2000.

June 6, 2000: CSR requiring Seattle Steam to report containing monthly residual fuel oil usage for calendar year 1999, pursuant to Condition 3 of General Regulatory Order 7740. The report was submitted by the deadline of June 30, 2000.

September 11, 1998: CSR requiring Seattle Steam to report residual fuel oil usage May 1997 thru May 1998 per Condition 4 of General Regulatory Order 6517. On September 16, 1998 Seattle Steam submitted a report indicating usage 23,553 gallons residual oil over that time period (in compliance with applicable limits).

April 4, 1996: CSR requiring Seattle Steam to explain and describe corrective actions regarding disturbed pipe insulation that was "asbestos containing material (ACM)." According to Seattle Steam response, ACM had been disturbed January 1996. The disturbed ACM was abated by April 8, 1996, according to a written response statement provided to the Agency by Seattle Steam on April 15, 1996.

Emission Inventory

Emissions at this facility come primarily from the operation of the four boilers. The boilers operate almost entirely on natural gas and only use residual fuel as an emergency backup fuel when natural gas is curtailed, and for training. Curtailment usually is caused by the cold weather demands during the winter months. Puget Sound Clean Air Agency Order No. 7740 limits Centrio's use of residual oil to not more than 3,822,000 gallons during any 12-month period. This is equivalent to about 31 days of full operation. The actual amount of time residual oil has been used is about a half-dozen times per year, and some of the times the use of oil has been for training.

The emissions of common pollutants are listed below.

Criteria Air Pollutants					
	1994 tons	**1995 tons**	**1996 tons**	**1997 tons**	**1998tons**
Carbon Monoxide	28	27	30	28	28
Nitrogen Oxides (Oxides of Nitrogen)	230	238	215	213	197
Particulate Matter	3	2	4	3	6
Sulfur Dioxide (Sulfur Oxides)	12	2	25	7	68
Volatile Organic Compounds (VOCs)	1	1	1	1	1

Toxic Air Contaminants					
	1994 lbs	**1995 lbs**	**1996 lbs**	**1997 lbs**	**1998 lbs**
Toxic Air Contaminants (TACs)	Not Available	1,920	2,240	2,040	2,188

The total annual reported emissions of VOC has been 1 ton per year since 1993 as calculated using published EPA emission factors. This value limits the total amount of TACs to less than the reporting trigger values of 2 tons for any one TAC as required in Regulation I, Section 7.09(a).

Explanation of Applicable Requirements

Applicable requirements are listed in several sections of this operating permit as outlined below. The permit only lists the requirements that the Puget Sound Clean Air Agency has determined to be within the scope of the definition of "applicable requirements" under the operating permit program. Centrio is legally responsible for complying with all applicable requirements of the operating permit as well as other requirements that do not fit the definition of "applicable requirements" found in Chapter 173-401 Washington Administrative Code (WAC). Some of the applicable requirements contain terms or monitoring, maintenance and recordkeeping that require detailed explanation in this statement of basis. The specific conditions are listed below, along with any necessary explanations in monitoring, maintenance and recordkeeping requirements.

Applicable Requirements

Centrio is subject to all the requirements listed in Section I of the permit. Section I.A contains the requirements that are applicable facility-wide and Section I.B contains requirements applicable only to specific emission units. The requirements in Section I.B apply only to the specific emission units cited; however, the requirements in Section I.A also apply to the specific emission units or activities described in Section I.B. If the monitoring, maintenance and recordkeeping method for any requirement in Section I.A is more extensive for specific emission units, that requirement is repeated in Section I.B with the additional monitoring, maintenance and recordkeeping requirements.

The requirement tables in Section I contain the following columns, identified here as column 1 on the left through column 7 on the right:

1. The identifier for the requirement, with each row numbered sequentially. Each row number is preceded by an identifier; "I.A." for facility-wide emission limits, and "EU-N.n" for emission unit specific conditions, where "N" is the number of the emission unit, and "n" is the row number of the requirement. This column is for information only and is not enforceable.
2. The citation for the applicable requirement. This can be a Puget Sound Clean Air Agency requirement, a Washington State Department of Ecology requirement, or a federal requirement. All requirements are federally enforceable unless they are identified in column two by the words "*STATE ONLY*."
3. The adoption or effective date of the requirement. In some cases, the effective dates of the **federally enforceable requirement** and the **state only requirement** are different because only requirements approved by EPA through Sections 110, 111, and 112 of the federal Clean Air Act are federally enforceable, and either the

state has not submitted the requirement to the EPA or the EPA has not yet approved it. When the EPA does approve the later requirement by adopting it into the State Implementation Plan, or "SIP"[4], the old requirement will be replaced and superceded by the new requirement. This replacement will take place automatically, with no changes being made to this permit until the permit is reissued.

4. A "paraphrasing" of the applicable requirement. In the event of conflict or omission between the information contained in the fourth column and the actual statute or regulation cited in the second column, the requirements and language of the actual statute or regulation cited shall govern. This column is for information only and is not enforceable.
5. The Monitoring, Maintenance & Recordkeeping Method that will be used by the facility to "reasonably assure continuous compliance" with the applicable requirement. Each compliance method is listed and linked to a full description in Section II of the air operating permit. Following these methods is an enforceable requirement of this permit.
6. The averaging time for the reference test method.
7. The reference method associated with an applicable emission limit that is to be used if a source test is required. In some cases where the applicable requirement does not cite a test method, one has been added.

Section I.A. (Facility-wide)

Requirement IA.1 – General Regulation

Requirement IA.1 contains the preamble to WAC 173-400-040, which itself contains all the basic emission limitations in Chapter 173-400 WAC. The brief sentence "Emissions from a common stack must meet the most restrictive standard of any of the connected emissions units" paraphrases several sentences in the actual regulation. The intent of this part of the rule is that when a facility has two or more processes venting through a common stack, and there is no practical way to distinguish how much each process contributes to the emissions from the stack, the most stringent emission standard in Chapter 173-400 WAC applies. It should be noted, however, that the "most stringent standard" provision does not apply to emission limits not contained in Chapter 173-400 WAC, such as the limits in notices of construction.

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4 "SIP" means "state implementation plan" which is a plan for improving or maintaining air quality and complying with the Federal Clean Air Act. The Federal Clean Air Act requires states to submit these plans to the US EPA for its review and approval. This plan must contain the rules and regulations of the state agency or local air authority necessary to implement the programs mandated by Federal law. Once the EPA adopts the plan or elements of it, the plan and its requirements become "federally enforceable" by EPA. New or modified state or local rules are not federally enforceable until they are "adopted into the SIP" by the EPA.

Centrio has two exhaust stacks; the silver stack vents both the RS and GS boilers while the black stack vents both the CED and CEA boilers.

Requirements IA.2 - General Opacity

Requirement IA.2 regulates visible emissions from opacity emission points that do not have continuous opacity monitoring systems (COMS). Both WAC 173-400-040(1) and Puget Sound Clean Air Agency Regulation I, Section 9.03 standards are 20% opacity and apply to all stationary sources. Regulation I, Section 9.03 applies to all stationary sources that do not have continuous opacity monitoring systems, but WAC 173-400-040(1) applies to all sources, with or without a COMS. The monitoring method is based on monthly visual inspections of all emission points (including the stacks, and anything else that might emit any opacity) at Centrio, with the source taking corrective action or using the reference test method, WDOE Method 9A, to determine opacity if any visible emissions are noted. The Puget Sound Clean Air Agency has determined that the monitoring should be monthly for the reasons listed below:

1) Initial compliance. The Puget Sound Clean Air Agency has not issued a Notice of Violation (NOV) to Centrio for a violation of visible emission requirements in the past five years.

2) Margin of compliance. The Centrio does not have any units that normally emit opacity, other than specifically listed emission units such as the boilers. No Puget Sound Clean Air Agency inspector has observed opacity emissions from any source other than the boiler stacks.

3) Variability of process and emissions. The ancillary processes are variable, depending upon fuel type and overall rate of operation of the particular emission unit. All potential sources of particulate emissions and/or opacity are to be maintained in accordance with the O&M Plan. The most significant variable affecting emissions would be the degree to which Centrio follows the O&M Plan.

4) Environmental impacts of problems. Observed opacity is generally related to emissions of particulate matter or finely divided liquid droplets. All the emission points at Centrio combined, including the boiler stacks, normally emit less than three tons of particulate per year, which is not significant in most cases. A temporary maintenance problem is unlikely to result in emissions that would have a significant environmental impact.

5) Technical considerations. Centrio is required to inspect all areas of the facility that have a reasonable chance of having opacity emissions at least once per quarter, and is required to follow O&M Manual procedures for minimizing opacity and particulate matter emissions by careful maintenance of good combustion conditions and during boiler ash handling operations.

Requirement IA.3 – Standards, SO_2

Puget Sound Clean Air Agency Regulation I, Section 9.07 and WAC 173-400-040(6) have been grouped together under Requirement IA.3 since they are equivalent

requirements (SO_2 emissions not to exceed 1,000 parts per million on a dry, volumetric basis[5] (ppmdv) corrected to 7% O_2) and have the same monitoring requirements.

The second paragraph of WAC 173-400-040(6), which is not in the Puget Sound Clean Air Agency regulations and is not adopted into the SIP, allows for exceptions to this requirement if the source can demonstrate that there is no feasible method of reducing the SO_2 concentrations to 1,000 ppmdv. This requirement is not federally enforceable.

The boilers primarily burn natural gas, with No. 6 residual oil as "back-up" during periods of natural gas curtailment and training. Puget Sound Clean Air Agency Regulatory Order No. 7740 limits Centrio's use of residual oil to not more than 3,822,000 gallons during any 12-month period. Centrio is incapable of violating the SO_2 limit while complying with the other requirements in the air operating permit. The following calculations for natural gas and residual oil show that it is mathematically impossible for a unit to emit 1,000 ppmdv sulfur dioxide while burning natural gas or complying with the sulfur content limitation in Puget Sound Clean Air Agency Reg I: 9.08(a).

Natural gas:

Natural gas is a mixture of gaseous hydrocarbons, with at least 80 percent methane (by volume), and of pipeline quality, such as the gas sold or distributed by any utility company regulated by the Washington Utilities and Transportation Commission. Natural gas may also be referred to as "pipeline quality natural gas." Centrio receives the same natural gas as all of the other natural gas consumers, private and industrial, in the Northwest. According to Section 1.4-3 of AP-42, natural gas contains approximately 0.2 grain per hundred cubic feet (2000 grains of sulfur per 10^6 ft^3), which is equivalent to approximately 3.4 parts of sulfur per million cubic feet of natural gas, as shown in the following calculation:

Equation 1

$$\left(\frac{2{,}000\,gr\,S}{1{,}000{,}000\,ft^3\,nat.gas}\right)\left(\frac{1\,lb}{7000\,gr}\right)\left(\frac{385\,\frac{ft^3}{mole\,S}}{32\,\frac{lb}{mole\,S}}\right)=3.44\times10^{-6}\,\frac{ft^3\,S}{ft^3\,nat.gas}\equiv 3.44\,ppmdv\,S$$

According to *Perry's Chemical Engineer's Handbook*, each cubic foot of natural gas requires approximately 10 cubic feet of air for combustion, yielding approximately 11

[5] "ppm" means "parts per million on a dry, volumetric basis." Sometimes this is written as "ppmdv." Stack gas is usually sampled through a probe placed somewhere in the middle of the stack cross-section. The moisture is removed from the gas stream as part of the sampling process. The stack gas sample is analyzed for the pollutant in question, with the lab results being calculated as cubic feet (or cubic meters) of pollutant per million cubic feet (or cubic meters) of dry stack gas. If you had a stack with 50% moisture that was running right at the 1,000 ppm SO_2 standard, you would have 1,000 cubic feet of SO_2 for every million cubic feet of dry stack gas. You would also have 1,000 cubic foot of SO_2 for every *two* million cubic feet of "wet" (as is) stack gas, which is 500 ppm. This is why it's important to know how stack sampling is done and why stack sampling and continuous emission monitoring methods are so specific.

cubic feet of combustion exhaust gases, consisting mostly of nitrogen, water vapor, and carbon dioxide. The sulfur in the natural gas will almost all be converted to sulfur dioxide, with each cubic foot of sulfur producing the same volume of sulfur dioxide. Since each cubic foot of natural gas contains 4.08×10^{-5} cubic foot of sulfur, each cubic foot of stack exhaust will contain approximately:

Equation 2

$$\left(3.44\times10^{-6}\frac{ft^3\,S}{ft^3\,nat.gas}\right)\left(\frac{1\,ft^3\,SO_2}{1\,ft^3\,S}\right)\left(\frac{1\,ft^3\,nat.gas}{11\,ft^3\,stack\,exhaust}\right)=3.13\times10^{-7}\frac{ft^3\,SO_2}{ft^3\,stack\,exhaust}$$

This is equivalent to 0.31 ppmdv SO_2 at stoichiometric combustion conditions. Correcting to 7% oxygen, we get:

Equation 3

$$0.31ppmdv\left(\frac{20.9}{20.9-\%O_{2\,(dry)}}\right)=0.31ppmdv\left(\frac{20.9}{20.9-7}\right)=0.46ppmdv$$

Note that this estimated value is less than one-tenth of one percent of the 1,000 ppmdv SO_2 standard. Therefore, it is reasonable to assume that combustion units that are fired on natural gas cannot exceed the 1,000 ppmdv SO_2 limits in Puget Sound Clean Air Agency Regulation I, Section 9.07 and WAC 173-400-040(6).

The above calculations were done using virtually universally accepted AP-42 factor for sulfur in natural gas. New data came to light during the course of permitting activities in the winter and spring of 2001, which indicated that sulfur in natural gas has been averaging around 3.5 grains per hundred cubic feet, with occasional spikes to as high as 10 grains per hundred cubic feet. **Scaling up the calculations shown above, we get 8 ppmdv SO_2 by burning 3.5 grain sulfur gas and 23 ppmdv SO_2 by burning 10 grain sulfur gas.**

Residual oil:

According to Table 19.1 of EPA Reference Method 19:

- Burning a million Btu of oil produces **9,190** dry standard cubic feet of stack gas.
- One part per million SO_2 is equivalent to **1.66×10^{-7}** pound of sulfur dioxide per dry standard cubic foot.

Equation 4 is derived from Equation 19-1 from EPA Reference Method 19, which is used to calculate SO_2 emissions in terms of pounds per million British thermal units of heat energy input (lb/MMBtu) at the emission limit of 1,000 ppmdv SO_2, corrected to 7% O_2.

Equation 4

$$E = C_d F_d \left(\frac{20.9}{20.9 - \%O_2} \right) = (1{,}000)(9{,}190)(1.66 \times 10^{-7}) \left(\frac{20.9}{20.9 - 7.0} \right) = 2.2938 \frac{lb}{MMBtu}$$

According to AP-42, Section 1.3:

- Burning 1,000 gallons of No. 6 oil produces **157** pounds of SO_2 multiplied by the percent sulfur ***(S)*** in the oil (using the actual percentage, not the decimal equivalent).
- There are **150** MMBtu/10^3 gallons of No. 6 oil.

Equation 5 is derived from the emission factor in Table 1.3-1, and is used to calculate the "sulfur content-dependent" SO_2 emissions in lb/MMBtu.

Equation 5

$$E = 157(S) \left(\frac{lb}{10^3\ gal} \right) = 157(S) \left(\frac{10^3\ gal}{150\ MMBtu} \right) = 1.0467(S) \frac{lb}{MMBtu}$$

Setting Equation 4 equal to Equation 5 we can determine the value for "S", which is the sulfur content of No. 6 oil when fueling combustion with a SO_2 exhaust concentration of 1,000 parts per million corrected to 7% O_2.

Equation 6

$$1.0467(S) = 2.2938$$

and,

$$S = \left(\frac{2.2938}{1.0467} \right) = 2.19\%$$

Equation 6 shows that a boiler burning No. 6 oil with a sulfur content of 2.19% will have an exhaust concentration of 1,000 ppmdv corrected to 7% O_2. Therefore, it is reasonable to assume that the Boiler Stacks, which are the only significant source of SO_2 at the Centrio Facility, will not emit SO_2 in excess of 1,000 ppmdv corrected to 7% O_2 if the boilers burn only natural gas, or oil containing no greater than 2.0% sulfur by weight.

Requirements IA.4 and IA.5 – General and Combustion PM Concentration

Puget Sound Clean Air Agency Regulation I, Section 9.09(a) *[federally enforceable]* and Section 9.09 *[STATE ONLY]* set particulate matter emission concentration limits, depending upon whether the regulated equipment is used in a manufacturing process, or if it burns fuel of specified types. Requirement IA.4 applies mainly to manufacturing

process emission units with exhaust stacks. Requirement IA.5 incorporates these requirements, and applies mainly to combustion-type emission units with exhaust stacks (other than the boilers that are regulated under emission unit-specific requirements). The Centrio controls emissions of particulate matter by use of "good engineering practice for minimizing emissions" in accordance with operation and maintenance procedures that are documented in the O&M Manual.

Observable opacity and particulate matter concentration tend to increase and decrease in direct proportion. To some extent, the monthly opacity readings used to reasonably assure compliance with Requirements IA.2 (opacity limit) will also reasonably assure compliance with Requirements IA.4 and IA.5 (particulate matter limits). Generally, the same problems that cause opacity will also cause an increase in particulate matter concentration, and any corrective action taken to reduce observed opacity will also reduce particulate matter concentration.

The monitoring method is based on quarterly facility-wide and roof-top inspections of the entire Centrio, with the source taking corrective action if any problems, such as excessive corrosion or damage to air pollution-related process or control equipment, are observed. The Puget Sound Clean Air Agency has determined that the monitoring should be done at the specified frequency for the reasons listed below.

1) Initial compliance. Puget Sound Clean Air Agency Regulation I, Section 9.09(a) *[federally enforceable]* and Section 9.09 *[STATE ONLY]* are similar requirements that address particulate matter emissions. The facility has never been found to be in violation of these requirements.

2) Margin of compliance. The emission points at Centrio, other than the boiler stacks, are unlikely to generate air contaminant emissions in sufficient quantities to violate particulate emission standards if they are properly maintained.

3) Variability of process and emissions. All potential sources of air contaminant emissions and/or opacity are required to be maintained in accordance with the O&M Plan. The most significant variable affecting emissions would be the degree to which Centrio follows its O&M Plan.

4) Environmental impacts of problems. All the emission points at Centrio combined, other than the boiler stacks, normally emit only negligible amounts of particulate matter per year. A temporary maintenance problem, if addressed in accordance with the requirements contained in the air operating permit, is unlikely to result in emissions that would have a significant environmental impact.

5) Technical considerations. Centrio is required to inspect all areas of the facility at least once per quarter, and is required to follow O&M Manual procedures for minimizing entrainment of dust during boiler ash handling operations.

In addition to the periodic inspections described above, Centrio is also required to actively respond to citizen complaints. The complaint response monitoring, maintenance

and recordkeeping method is fully explained in Section II.A.1(b) of the air operating permit.

Requirements IA.6 – "Nuisance"

Puget Sound Clean Air Agency Regulation I, Section 9.11(a) and Department of Ecology WAC 173-400-040(5) state that a source shall not emit air contaminants in sufficient quantities and of such characteristics and duration as is, or is likely to be, injurious to human health, plant or animal life, or property, or which unreasonably interferes with enjoyment of life and property.

The monitoring methods are based on responding to complaints and general, facility-wide inspections of the facility to identify any emissions that are likely to be injurious to human health, plant or animal life, or property, or that unreasonably interfere with enjoyment of life and property. Receiving complaints does not necessarily mean Centrio is in violation of this requirement; however, Centrio has a responsibility to investigate complaints and take corrective action if necessary. Other than boiler ash, Centrio does not handle or process material that is likely to cause fugitive dust emissions. Therefore, the Puget Sound Clean Air Agency has determined that complaint response and the quarterly facility-wide inspections required in Section II.A.1(c) of the permit are sufficient to monitor for changes that would cause fugitive emissions. The Puget Sound Clean Air Agency has determined that the monitoring should be done at the specified frequencies for the reasons listed below.

1) Initial compliance. The facility has never been found to be in violation of the requirements of Puget Sound Clean Air Agency Regulation I, Section 9.11(a).

2) Margin of compliance. The most likely source of air contaminants that could violate Section 9.11(a) would be from smoke emissions resulting from a change from natural gas to residual oil during natural gas curtailment or training exercises. Trained Boiler operators oversee boiler operation continuously to ensure proper combustion conditions are present during all operational modes, including the critical natural gas to residual oil switchover, minimizing emissions of air pollutants. Plant personnel will be able to take corrective action before problems with the boilers could become bad enough to cause a violation of Section 9.11(a).

3) Variability of process and emissions. All potential sources of air contaminant emissions and/or opacity are maintained in accordance with the O&M Plan. The most significant variable affecting emissions would be the degree to which Centrio follows the O&M Plan (same rationale as Requirements IA.2 and IA.11, above).

4) Environmental impacts of problems. A temporary maintenance problem is unlikely to result in emissions that would have a significant environmental impact (same rationale as Requirements IA.2 and IA.11, above).

5) Technical considerations. Centrio is required to inspect all areas of the facility at least once per quarter, and is required to follow O&M Manual procedures for minimizing air pollution emissions during fuel change over events and exercises.

In addition to the periodic inspections described above, Centrio is also required to actively respond to citizen complaints. The complaint response monitoring, maintenance and recordkeeping method is fully explained in Section II.A.1(b) of the air operating permit.

Requirements IA.7 through IA.11– Fugitive Dust

It should be noted that the Centrio is nothing more than a medium-sized building with four boilers inside and two stacks coming out of the top; there are no sources of fugitive emissions on the entire facility. Company personnel have asked why these requirements are in the air operating permit if there are no sources of fugitive emissions. The answer is that these requirements are in the air operating permit because they apply to all sources within the boundaries of the Puget Sound Clean Air Agency. The inspections for these requirements can be incorporated into the routine facility-wide inspections and complaint response activities.

"Fugitive dust" is particulate matter that is emitted from some opening, hole, or gap on a piece of equipment, or from unpaved haul roads, as opposed to emissions of particulate matter from a smoke stack or vent designed for the purpose of exhausting air pollutant emissions.

- Requirement IA.7 includes the federally enforceable version of Puget Sound Clean Air Agency Regulation I, Section 9.15(a), which requires that "best available control technology" be employed by Centrio to minimize fugitive dust emissions. This requirement also includes WAC 173-400-040(3), which addresses fugitive dust emissions for some activities, and WAC 173-400-040(8), which requires reasonable precautions or reasonably available control technology (RACT) to control fugitive emissions.
- Requirement IA.8 includes the federally enforceable version of Puget Sound Clean Air Agency Regulation I, Section 9.15(b), which requires Seattle Steam to prevent track-out and spillage of particulate matter on paved public roadways.
- Requirement IA.9 includes the federally enforceable version of Puget Sound Clean Air Agency Regulation I, Section 9.15(c), which requires Seattle Steam to prevent fugitive dust emissions from any fuel burning equipment, equipment used in a manufacturing process, or control equipment.
- Requirement IA.10 includes the non-federally enforceable version of Puget Sound Clean Air Agency Regulation I, Section 9.15(c), which requires Seattle Steam to not deposit particulate matter beyond property boundaries in sufficient quantity to interfere unreasonably with the use and enjoyment of the property.
- Requirement IA.11 includes the non-federally enforceable version of Puget Sound Clean Air Agency Regulation I, Section 9.15(a) makes fugitive particulate emissions illegal unless "reasonable precautions" are employed, and then even goes of to describe some of the precautionary measures.

All of these requirements are generally interpreted to mean that equipment has to be operated and maintained so that fugitive emissions are minimized, and when that doesn't happen, corrective action must be taken.

The Puget Sound Clean Air Agency Board of Directors revised Section 9.15 on March 11, 1999 and it became effective April 17, 1999. The amended version has been

forwarded to EPA as a SIP amendment. Upon approval of the SIP changes, the revised version of Regulation I, Section 9.15 will be federally enforceable and the old version will no longer apply. The revised rule requires the use of reasonable precautions for fugitive dust and lists some examples of reasonable precautions, and is listed in the AOP as Requirement IA.11.

Recording of fugitive dust emissions during routine facility-wide inspections and following up on complaints is not necessarily a violation of these requirements, since the requirements do not prohibit fugitive dust emissions, but prohibits fugitive dust emissions when the required level of precautions is not employed.

The monitoring method is based on rapid complaint response and on quarterly facility-wide and roof-top inspections of the entire Centrio, with the source taking corrective action if any problems, such as excessive corrosion or damage to air pollution-related process or control equipment, are observed. The monitoring method is consistent with Puget Sound Clean Air Agency's *"Agency Policy on Fugitive Dust Controls, March 1995,"* which specifies reasonable precautions that must be taken to prevent fugitive dust emissions, but does not necessarily define BACT for all processes. The Puget Sound Clean Air Agency has determined that the monitoring should be done at the specified frequencies for the reasons listed below.

1) Initial compliance. No complaints have been received and no Notices of Violation (NOVs) issued by the Puget Sound Clean Air Agency as a result of fugitive emissions. This is because the Centrio does not have any sources of fugitive emissions. Therefore, the Puget Sound Clean Air Agency concludes that Centrio is generally in compliance with the fugitive emission requirements.

2) Margin of compliance. The monitoring method is designed so that the source will take corrective action before a violation occurs.

3) Variability of process and emissions. All potential sources of air contaminant emissions and/or opacity are maintained in accordance with the O&M Plan. The most significant variable affecting emissions would be the degree to which Centrio follows the O&M Plan.

4) Environmental impacts of problems. A temporary maintenance problem at the emission points of Centrio, if corrected as required in the monitoring method, is unlikely to result in emissions that would have a significant environmental impact.

5) Technical considerations. Centrio is required to inspect all areas of the facility at least once per quarter, and is required to follow O&M Manual procedures for minimizing entrainment of dust from storage piles or during boiler ash handling operations.

In addition to the periodic inspections described above, Centrio is required to actively respond to citizen complaints. The complaint response monitoring, maintenance and recordkeeping method is fully explained in Section II.A.1(b) of the air operating permit.

Requirements IA.12 and EU-1.1 – Maintain In Good Working Order

Puget Sound Clean Air Agency Regulation I, Section 9.20 requires Centrio to maintain equipment in good working order. Section 9.20(a) applies to sources that received a NOC Order of Approval under Puget Sound Clean Air Agency Regulation I, Article 6. Section 9.20(b) applies to equipment not subject to Section 9.20(a). Section II.A, Monitoring, Maintenance and Recordkeeping Procedures of the permit, identifies the minimum monitoring criteria for maintaining equipment in good working order. The section identifies both facility-wide criteria and specific criteria for the emission units and activities. In addition, the facility-wide inspections provide monitoring of the general effectiveness of Centrio O&M Plan. The Puget Sound Clean Air Agency chose to list all of Section II.A as the monitoring method because many parts of Section II.A apply to several emission units and activities. Where there are specific monitoring requirements for specific emission units, the Puget Sound Clean Air Agency has listed them in Section II.A.2. The Puget Sound Clean Air Agency has determined that following the requirements of Section II of the permit provides sufficient monitoring criteria to certify that the equipment has been maintained in good working order. However, the Puget Sound Clean Air Agency reserves the right to evaluate the maintenance of each piece of equipment to determine if it has been maintained in good working order. Note that EU-1.1 is an emission unit-specific requirement, but it has been included here because this explanation is exactly the same as it would be if it were repeated in the "Emission Unit Specific" section below.

Requirement IA.13 – O&M Plan

In accordance with Puget Sound Clean Air Agency Regulation I, Section 7.09(b), Centrio is required to develop and implement an O&M Plan to assure continuous compliance with Puget Sound Clean Air Agency Regulations I, II, and III. The requirement specifies that the plan shall reflect good industrial practice, but does not define how to determine good industrial practice. To clarify the requirement, the Puget Sound Clean Air Agency has added that, in most instances, following the manufacturer's operations manual or equipment operational schedule, minimizing emissions until the repairs can be completed and taking measures to prevent recurrence of the problem may be considered good industrial practice. This requirement is consistent with a Washington Department of Ecology requirement in WAC 173-401-615(1)(c). The Puget Sound Clean Air Agency has also added language establishing criteria for determining if good industrial practice is being used. These criteria include: monitoring results, opacity observations, review of operations and maintenance procedures, and inspections of the emission unit or equipment. The Puget Sound Clean Air Agency added this wording in response to Washington State court decision, Longview Fibre Co. v. DOE, 89 Wn. App. 627 (1998), which held that similar wording was not vague and gave sufficient notice of the prohibited conduct.

Puget Sound Clean Air Agency Regulation I, Section 7.09(b) also requires Centrio to promptly correct any defective equipment. However, the underlying requirement in most instances does not define "promptly"; so the Puget Sound Clean Air Agency added

clarification that "promptly" usually means "as soon as possible, but not later than within 24 working hours" from when the problem is first observed. For many insignificant emission units and for equipment not listed in the permit, "promptly" cannot be defined, because the emission sources and suitable pollution control techniques vary widely, depending on the contaminant sources and the pollution control technology employed. However, the permit identifies a means by which to identify if Centrio is following good industrial practice.

As described in Section V.P, Centrio must report to the Puget Sound Clean Air Agency any instances where it failed to promptly repair any defective equipment. In addition, Centrio has the right to claim certain problems were unavoidable (Section V.R) or the result of an emergency (Section V.Q).

Following these requirements demonstrates that Centrio has properly implemented the O&M Plan, but it does not prohibit the Puget Sound Clean Air Agency or EPA from taking any necessary enforcement action to address violations of the underlying applicable requirements after proper investigation.

Requirement IA.14 - Odors

WAC 173-400-040(4) addresses odors. The monitoring method is based on responding to complaints and general inspections of the facility to identify emissions of odor-bearing contaminants and correcting any problems identified as a result of the inspection or investigation. Receiving complaints does not necessarily mean Centrio is in violation of this requirement, since the regulation does not prohibit the emission of odors, but prohibits the emissions of odors if BACT is not employed to control emissions. Complaints will trigger action by Centrio to investigate and prevent a violation.

Requirement IA.15 – Fugitive Dust

RCW 70.94.040 is similar to Puget Sound Clean Air Agency Regulation I, Section 9.11 and is listed separately here because it is not a federally enforceable requirement.

Section I. B. (Emission Unit Applicable Requirements)

Section I.B. of the permit lists applicable requirements that are specific to an emission unit or activity. The Generally Applicable Requirements of Section I.A. apply to all the emission units listed in Section I.B. and are not repeated in this section. Monitoring Methods and Reference Methods are also identified if they are different from, or in addition to, those listed in Section I.A.

The EPA incorporates what the EPA has determined to be "all necessary monitoring" into all recently adopted federal air pollution regulations. Where a recently adopted federal regulation does not identify a monitoring method, the permit does not identify one either, except in some cases where the Puget Sound Clean Air Agency has determined additional monitoring to be necessary. Finally, any requirements that are inapplicable to the specific emission unit are also listed in this section.

Requirements EU-1.3 – Standards, Fuel

These permit requirements all contain Puget Sound Clean Air Agency Regulation I, Section 9.08(a), which sets limits for ash, sulfur, trace metals, and flash temperature in fuel oil. These regulatory limits have been incorporated into the Revised Code of Washington, Section 70.94.610, "Burning used fuel oil in land-based facilities." "Used" oil is typically oil that has been drained from a gasoline or diesel fueled internal combustion engine at the end of the oil service interval. Regulation I, Section 9.08(a) attempts to limit emissions of trace compounds from an oil-fired boiler by setting limits on the trace compounds that might be present in fuel oil. These limits were developed to restrict blending of used oil or solvents into fuel oils. Generally, any "new" or non-used distillate or very low sulfur oil does not contain any of the listed trace elements at concentrations even approaching the standards.

The U.S Oil & Refining Company is another source within the jurisdiction of the Puget Sound Clean Air Agency that is applying for an air operating permit. The U.S Oil & Refining Company also has to comply with Puget Sound Clean Air Agency Regulation I, Section 9.08(a). The U.S Oil & Refining Company tested and certified each batch of residual fuel oil prior to combustion in refinery fuel oil burning equipment in order to verify compliance with Regulation I, Section 9.08(a), and recently applied to the Puget Sound Clean Air Agency for permission to reduce the testing requirements because the test results are consistently far below the standards. The testing was done on all batches of residual fuel oil received from January 1994 through October 1997. The reported values were examined and the values that are closest to the allowable levels are shown in the table below:

Compound or parameter	Regulatory Limit	U S Oil and Refining Measurement	Percent of Standard
Ash	0.1%	0.026%	26%
Sulfur, used oil	1.0%	n/a	n/a
Sulfur, fuel oil	2.00%	1.92%	96%
Lead	100 ppmdv	<1ppmdv	1%
Arsenic	5 ppmdv	<1ppmdv	20%
Cadmium	2 ppmdv	<1ppmdv	50%
Chromium	10 ppmdv	<1ppmdv	10%
Total halogens	1,000 ppmdv	Non-detectable	n/a*
PCBs	2 ppmdv	Non-detectable	n/a*
Flash point (minimum allowable)	100 °F	184 °F	184%**

* Halogens and PCBs are only found in used oil.
** The regulatory limit of 100 °F is a minimum. Therefore, a higher percentage indicates a higher compliance "safety margin."

The Centrio can reasonably assure continuous compliance with Puget Sound Clean Air Agency Regulation I, Section 9.08(a) by filling the Power Plant oil tanks with new residual oil.

Requirement EU-1.4 through EU-1.8 – Standards, Residual Oil Usage, as surrogate for Opacity and Particulate Matter

Requirement EU-1.4 contains the limitations and usage requirements placed on combustion of residual oil by Seattle Steam, which is broken out into three parts:

- Puget Sound Clean Air Agency Regulation I, Section 9.04, which requires fuel burning equipment rated at ≥ 100 MMBtu/hr that burns residual oil for ≥ 31 days per year to have a CEMS for opacity;
- Puget Sound Clean Air Agency Regulation I, Section 3.23, which states that other emission control methods may be employed to achieve compliance if they are demonstrated to be just as effective and are included in a Puget Sound Clean Air Agency Regulatory Order or permit; and finally, because Seattle Steam did fulfill the Section 3.23 requirements,
- General Regulatory Order No. 7740 which requires Seattle Steam to limit the combustion of fuel oil to a maximum of 3,822,000 gallons in any consecutive 12-month period, notify Puget Sound Clean Air Agency prior to combustion of residual oil, to establish limit values and monitor combustibles and oxygen of boiler exhaust as required O&M Plan. Seattle Steam is also required to report monthly fuel oil usage to Puget Sound Clean Air Agency for any 12 consecutive month period that ≥ 3,000,000 gallons of residual oil are burned.

Conditions 1 through 8 of General Regulatory Order No. 7740 are mostly monitoring requirements, so they were placed as monitoring requirements in Section II.A.(2)(b), which are linked to Column 5 of Requirement EU-1.4.

EU-1.5 – Standards, Opacity

This requirement contains Puget Sound Clean Air Agency Regulation I, Section 9.03 and WAC 173-400-040(1), which limits the boiler stacks to no more than 20% opacity over periods aggregating more than three minutes in any hour. The monitoring methods for this requirement are those requirements in Order No. 7740 which limit oil usage and require Seattle Steam to correlate opacity to operating parameters, specifically stack oxygen and combustible gas concentrations, and to maintain those levels within specified limits.

EU-1.6 and EU-1.7 – Standards, Particulate Matter

EU-1.6 contains Puget Sound Clean Air Agency Regulation I, Section 9.09 (both federally-enforceable and non federally-enforceable versions), which limit the boiler stacks to no more than 0.05 grain of particulate matter per dry standard cubic foot, corrected to 7% O_2. EU-1.7 contains WAC 173-400-050(1) and (3) which limit the boiler stacks to no more than 0.10 grain of particulate matter per dry standard cubic foot, corrected to 7% O_2. The monitoring methods for this requirement are those requirements in Order No. 7740 which require Seattle Steam to stack test for particulate matter emissions when burning residual oil for more than 14 consecutive days, in addition to the monitoring required for UE-1.5, above.

Requirement EU-1.8 – Standards, SO_2

As shown above in the discussion for Requirement IA.3, above, Seattle Steam will not exceed the 1,000 ppmdv sulfur dioxide limit (corrected to 7% O_2) while burning natural gas or complying with the sulfur content limitation in Puget Sound Clean Air Agency Reg I: 9.08(a).

Requirement EU-1.9 – Hydrogen Chloride

Puget Sound Clean Air Agency Regulation I, Section 9.10(a) specifies that HCl emissions shall not exceed 100 ppmdv (dry), corrected to 7% O_2 for combustion sources. Since Centrio currently burns only pipeline-grade natural gas and "new" residual fuel oil.

Refer to the "Conversion Factors for Concentration" table in Section 2 of Reference Method 19 to compute value for C_d. *Note that this factor is equal to molecular weight of the pollutant divided by* 10^6*, and then divided by* 385.3 ft^3 *per mole.* The conversion factor for HCl is $36.46\times10^{-6}/385.3$ $ft^3 = 9.463\times10^{-8}$ lb/dscf-ppmdv. One part per million of HCl is equivalent to 9.463×10^{-8} lb HCL per dry standard cubic foot of stack gas.

Residual oil:

According to AP-42, Section 1.3:

- Burning 1,000 gallons of No. 6 "residual" oil produces 0.347 pound of chloride. Assume all of the chloride is emitted in the form of hydrogen chloride.
- There are 150 MMBtu/10^3 gallons of No. 6 oil.

Equation 7 converts the emission factor for chloride in Table 1.3-11from pounds of HCl per 1,000 gallons of oil burned to pounds per million Btu.

Equation 7

$$E = 0.347\ \frac{lb}{10^3\ gal} = 0.347\ \frac{10^3\ gal}{150\ MMBtu} = 0.00231\ \frac{lb}{MMBtu}$$

According to Table 19.1 of EPA Reference Method 19:

- Burning a million Btu of oil produces 9,190 dry standard cubic feet of stack gas.
- One part per million SO_2 is equivalent to 9.463×10^{-8} pound of sulfur dioxide per dry standard cubic foot.

Equation 8 is derived from Equation 19-1 from EPA Reference Method 19, which may be used to calculate parts per million HCl, corrected to 7% O_2, from HCL emissions in lb/MMBtu.

Equation 8

$$C_d = E\left(\frac{\left(\frac{20.9-\%O_{2\,(dry)}}{20.9}\right)}{F_d}\right) = 0.00231\ \frac{lb}{MMBtu}\left(\frac{\left(\frac{20.9-7}{20.9}\right)}{\left(9{,}190\ \frac{dscf}{MMBtu}\right)\left(9.46\times10^{-8}\ \frac{lb}{dscf-ppmdv}\right)}\right) = 1.77\ ppmdv$$

Therefore, based on the AP-42 emission factor for HCl (expressed as chloride) from new residual oil, the concentration of HCl in the boiler exhaust will be less than 2% of the regulatory limit of 100 ppmdv, corrected to 7% O_2,.

Monitoring, Maintenance and Recordkeeping Procedures

Centrio must follow the procedures contained in Section II of the permit, Monitoring, Maintenance and Recordkeeping Procedures. Failure to follow a requirement in Section II may not necessarily be a violation of the underlying applicable emission standard in Section I. However, not following a requirement of Section II is a violation of Section II and Centrio must report such violations, as well as violations or deviations from any other permit condition, as a deviation under Section V.P.1.(b) of the permit. In addition, all information collected as a result of implementing Section II can be used as credible evidence under Section V.N.2 of the permit. Reporting a permit deviation and taking

corrective action does not relieve Centrio from its obligation to comply with the underlying applicable requirement.

In determining the appropriate monitoring frequencies for monitoring identified in Section II.A of the permit, the Puget Sound Clean Air Agency considered several factors, including the following:

1) Centrio compliance history and the likelihood of violating the applicable requirement;

2) The complexity of the emission unit including the variability of emissions over time;

3) The likelihood that the monitoring would detect a compliance problem;

4) The likely environmental impacts of a deviation;

5) Whether add-on controls are necessary for the unit to meet the emission limit;

6) Other measures that Centrio may have in place to identify problems;

7) The type of monitoring, process, maintenance, or control equipment data already available for the emissions unit;

8) The technical and economic considerations associated with the range of possible monitoring methods; and

9) The type of monitoring found on similar emissions units.

EPA Region 10 expressed concern as to the adequacy of the chosen monitoring, maintenance and recordkeeping methods, particularly pertaining to the monitoring frequencies chosen. Meetings were held with EPA Region 10 in an effort to establish an acceptable procedure for determining the appropriate monitoring frequencies for the various monitoring methods. An agreement was reached that the Puget Sound Clean Air Agency would evaluate monitoring frequencies in accordance with the procedures and factors below:

1) Initial compliance;

2) Margin of compliance;

3) Variability of process and emissions;

4) Environmental impacts of problems; and

5) Technical considerations.

The permit requires Centrio to conduct quarterly facility-wide inspections. These inspections are to include checking for prohibited activities under Section III of the permit and activities that require additional approval under Section IV of the permit, as well as checking for any "nuisance" odor bearing contaminants. The Puget Sound Clean Air Agency determined the frequency of these inspections after considering the potential

for emissions, the lack of federally required monitoring, Centrio in-house training practices, and similar factors. If problems are identified, Centrio has the responsibility to not only correct the specific problem, but also to adjust the work practices and training to prevent future problems.

Prohibited Activities

Some of the requirements Centrio identified in the operating permit application are included in Section III as prohibited activities. The Puget Sound Clean Air Agency has listed these activities in this section to highlight that they cannot occur at the facility. Since these activities are prohibited, routine monitoring of parameters is not appropriate; however, the permit does require Centrio to look for such activities during a routine facility-wide inspection.

Puget Sound Clean Air Agency Regulation I, Section 9.13 and WAC 173-400-040(7) contain similar requirements addressing concealment and masking of emissions. Although both requirements apply, the permit language has been simplified by grouping these requirements together.

Activities Requiring Additional Approval

Some of the requirements Centrio identified in the operating permit application are included in Section IV as activities that require additional approval. For new source review, the permit language has been simplified. Chapter 173-460 WAC and Puget Sound Clean Air Agency Regulation I, Article 6 New Source Review Programs require approval to construct, install, establish, or modify an air contaminant source. All these requirements apply, but the language in these requirements has been incorporated into one section to simplify the permit language. WAC 173-400-110 does not apply within Puget Sound Clean Air Agency's jurisdiction because the rule exempts areas that have a local program that is incorporated into the state implementation plan.

Standard Terms and Conditions

This section contains the standard terms and conditions specifically listed in WAC 173-401-620, as well as other conditions that apply to Centrio.

Some of the requirements Centrio identified in the operating permit application are included in Section V, Standard Terms and Conditions. This section also contains the standard terms and conditions specifically listed in WAC 173-401-620.

Section V.P.1.(b) of the permit requires Centrio to report deviations of the permit to the Puget Sound Clean Air Agency, normally within 30 days after the end of the month. Section V.P.1.(e) of the permit requires that a responsible official certify all required reports at least once every six months. Centrio may submit the certification with the report or certify all the reports submitted in the previous six months. For example, if Centrio detected a deviation in January, it must report the deviation to the Puget Sound Clean Air Agency in February. A responsible official must certify the report according to

WAC 173-401-520 at the time the report is submitted or any other time within six months of submitting the report.

If Centrio does not detect any deviations to report for a six-month period, then Centrio shall report that there were no deviations during the six-month period.

Section V.V of the permit requires Centrio to comply with Section 112(r) Risk Management program of the EPA, as required in 40 CFR Part 68. Centrio has certified that it does not use any 112(r) regulated substances in excess of the threshold quantities.

Insignificant Emission Units

As of the date of permit issuance, the emission units listed below are defined as insignificant for the reasons indicated. Centrio does not have to certify these emission units are in compliance with the generally applicable requirements listed in Section I.A. of this permit. [WAC 173-401-530(2)(d) and WAC 173-401-533]

Unit	Basis for IEU Designation
Roadways	WAC 173-401-530(1)(d)
Emergency diesel generators, 947 HP, 140 gal/hr fuel consumption	Regulation I, Section 5.03(4), WAC 173-401-533 (Ecology February 6, 1995 memo)
Diesel storage tanks (250 gallons)	WAC 173-401-533(2)(c)
Hot water heaters, natural gas-fired, <5 MMBtu/hr heat input	WAC 173-401-530(1)(c), WAC 173-401-533(2)(e) WAC 173-401-533(2)(r)
Laboratory vent	WAC 173-401-532-9, WAC 173-401-533-3c
Steam vents and leaks	WAC 173-401-532-87
Maintenance activities	WAC 173-401-532-6, 12, 33, 39, 55, 67, 69, 73, 74, 88, WAC 173-401-533(2)(i)
Electrical equipment	WAC 173-401-532-118
Water treatment and conditioning	WAC 173-401-532(4), WAC 173-401-532(2)(s)
Office and related activities	WAC 173-401-532-46, 48, 49, 79

Obsolete Requirements

The Puget Sound Clean Air Agency issued NOC Orders of Approval Nos. 106, 1066, 6517, and 7740 to Centrio. The Puget Sound Clean Air Agency has determined that some of the approval conditions are now informational statements because they have already been complied with and, therefore, do not meet the criteria of being applicable requirements. Those approval conditions are described here and are not listed in the air operating permit.

Condition No. 9 of General Regulatory Order No. 7740, issued on September 9, 1999, supersedes and cancels General Regulatory Order No. 6517 issued on May 8, 1997.

Condition No. 4 of General Regulatory Order No. 7740, issued on September 9, 1999, required Centrio to establish a correlation between stack opacity and exhaust concentrations of oxygen and combustibles, and to complete the study by February 29, 2000 and to submit results to the Puget Sound Clean Air Agency by March 17, 2000. Centrio fulfilled this requirement by April 11, 2000.

Requirements Listed as "Inapplicable" by the Applicant but Not Accepted by Puget Sound Clean Air Agency

Public Comments and Responses

Public Notice

A notice soliciting public comments about this draft air operating permit was published on March 27, 2002 in the Journal of Commerce and the Seattle Times. This message was posted on the Puget Sound Clean Air Agency web site:

Seattle Steam
Permit #13786
Posted online: 3-25-2002 | Opens: 3-27-2002 | Closes: 4-26-2002

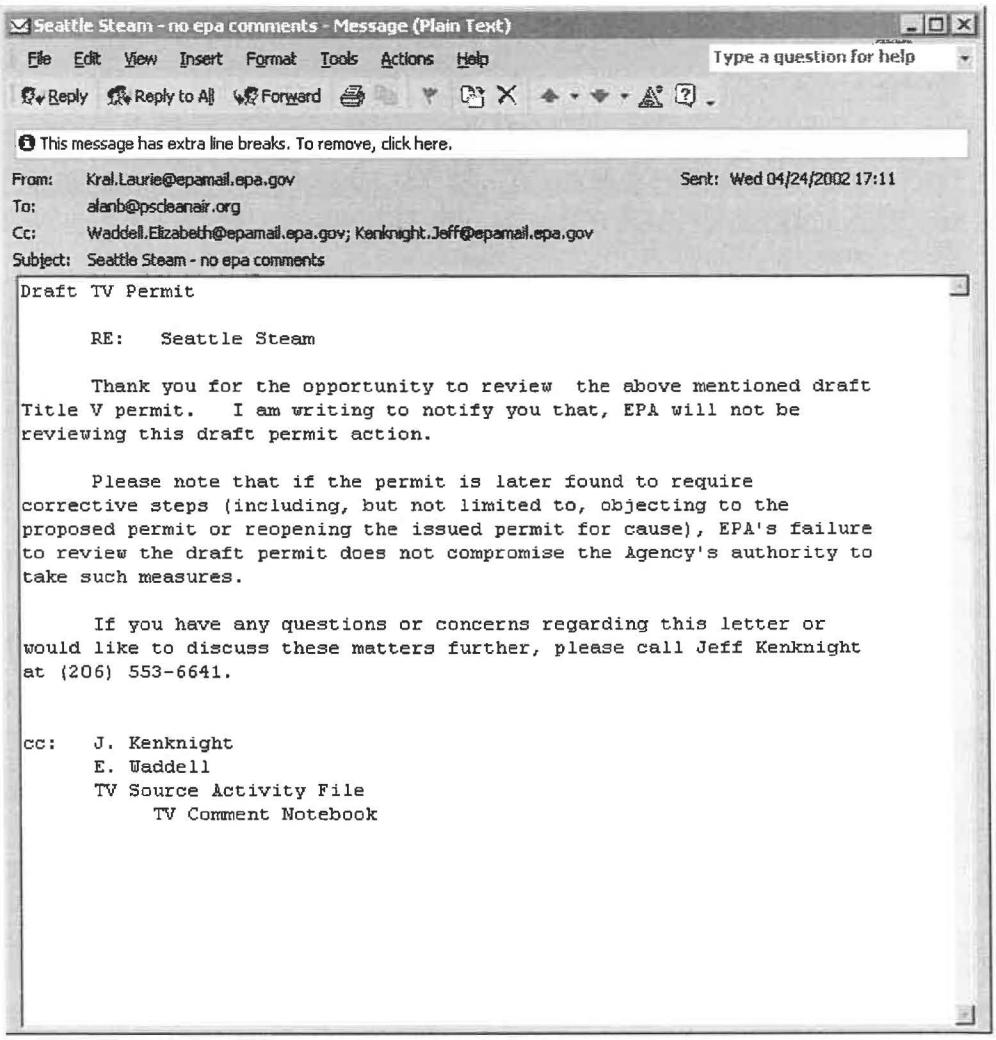
- Overview
    - Puget Sound Clean Air Agency is seeking comments on a draft Air Operating Permit for Centrio, located at 1319 Western Avenue in Seattle, Washington 98101. Centrio is a steam supply company that releases oxides of nitrogen, carbon monoxide, sulfur dioxide, and particulate matter to the outside air. This draft Air Operating Permit compiles existing air quality requirements into one document and establishes monitoring and recordkeeping to ensure compliance with those requirements. The permit does not affect the type or quantity of air emissions from the facility, and does not authorize any increase in emissions above that already allowed.
- Files available for viewing/downloading as PDF files:
    - Public Notice [PDF, 72KB]
    - Statement of Basis [PDF, 262KB]
    - Draft Air Operating Permit [PDF, 372KB]
- Technical contact information:
    - Alan Butler
- General agency contact info:
    - Find our offices

- Main agency numbers

Comments Received

EPA Region X:

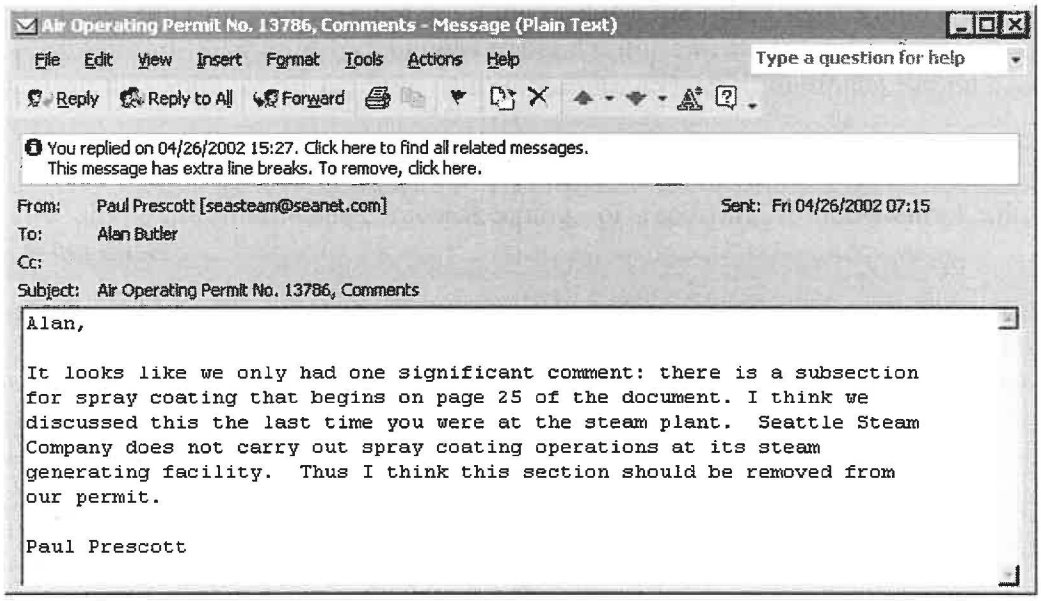
Comment:



Puget Sound Clean Air Agency Response:

No response necessary.

Seattle Steam:



Puget Sound Clean Air Agency Response:

Section IV.D in the air operating permit simply states in the AOP a rule that applies to Seattle Steam whether they spray-paint anything or not. The rule, Puget Sound Clean Air Agency Regulation I, Section 9.16, contains general requirements for indoor and outdoor spray-painting that apply to all facilities within the jurisdiction of the Puget Sound Clean Air Agency.

Currently "non-exempt" painting is not being done at Seattle Steam. Section IV.D does not require any extra monitoring, recordkeeping, or reporting if non-exempt spray-painting is not done.

With Section IV.D in the air operating permit, if Seattle Steam ever does need to do indoor or outdoor non-exempt spray-painting, all they have to do is apply to the Agency, which will review the application and issue a Notice of Construction Order of Approval. Monitoring, recordkeeping, and any necessary reporting requirements that are required to "reasonably assure continuous compliance" of the new painting operation will be placed in the Order. The order will be attached to the air operating permit, and will be fully incorporated into that air operating permit when the air operating permit is open for routine renewal.

If Section IV.D. is removed from the air operating permit, a statement will have to be placed in Section VIII of the air operating permit that Regulation I, Section 9.16 does not apply to Seattle Steam. This will not remove any monitoring requirements. Seattle Steam will then be prevented from conducting any non-exempt spray painting operations without first applying for and receiving a modification to their air operating permit.

Therefore, the Puget Sound Clean Air Agency has not made the change requested by Seattle Steam.