General Information and Certification

AIR OPERATING PERMIT RENEWAL APPLICATIONS

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ORCAA

1. Company Name: Sierra Pacific Industries
2. Plant or Facility Name: Sierra Pacific Industries - Aberdeen Division
3. Air Operating Permit Number: 04AOP358
4. Facility Description: Cogeneration of steam and electricity from wood waste combustion
5. Facility Address: 301 Hagara Street Aberdeen, WA 98520
6. Mailing Address: (if different) - Same -
7. Parent Company: Sierra Pacific Industries
8. Parent Company Address if Different Than Above: P.O Box 496028 Redding, CA 96049
9. ORCAA File #: 244
10. Primary SIC: 4911
11. Facility contact familiar with the information contained in this application.
    - Name: John Gardner
    - Title: Co-gen Supervisor
    - Telephone: (360) 532-2323
12. Permit cover page changes (Responsible Official, Contact Person...):
    Responsible Official - local : Matthew Tabarski - Plant Manager
    Responsible Official - Corporate : Dave Brown - Director of Environmental Affairs
13. Were there any off-permit changes according to WAC 173-401-724? [yes☐ no☒] If yes, integrate changes into permit? [yes☐ no☐; if no, explain]:
14. Were there any Section 502(b)(10) changes? [yes☐ no☒] If yes, integrate changes into permit? [yes☐ no☐; if no, explain]:
15. Are the current emissions units correctly identified and defined in the permit? [yes☒ no☐]

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16. Does the accidental release prevention regulation apply to the facility? [yes☐ no☒; if yes, list the regulated substances present in processes at the facility and identify the applicable program]

17. Are there any other new applicable requirements? [yes☐ no☒; if yes, list the new applicable requirements, emissions units, and monitoring requirements]

18. Is the source in compliance with all of the conditions of the current permit [yes☒ no☐; if no, attach a compliance schedule]

19. Are there any requested changes to testing conditions? [yes☐ no☒; if yes, identify the condition, the requested change and the reason]

20. Are there any requested changes to monitoring conditions other than those being replaced by CAM?? [yes☐ no☒; if yes, identify the condition, the requested change and the reason]

21. Are there any requested changes to recordkeeping conditions? [yes☐ no☒; if yes, identify the condition, the requested change and the reason]

22. Are there any requested changes to reporting conditions? [yes☐ no☒; if yes, identify the condition, the requested change and the reason]

23. Are there any requested changes to the non-applicable conditions? [yes☐ no☒; if yes, identify the condition, the requested change and the reason]

24. Are there any other requested changes to any conditions? [yes☐ no☒; if yes, identify the condition, the requested change and the reason]

25. Claim of Confidentiality:
Some of the records and information contained in this application are☐ are not☒ (check one) unique to the applicant and/or are likely to adversely affect the competitive position of the applicant if released to the public or a competitor. If a claim of confidentiality is made for this application, provide a separate application for general distribution which is devoid of confidential information.

26. I certify that I am the responsible official, as defined in WAC 173-401-200(27) for this facility. I further certify as required by WAC 173-401-520, that, based on information and belief formed after reasonable inquiry, the statements and information in this application are true, accurate, and complete.

Signature of Responsible Official	Date	Title
[signature]	01/10/12	Division Manager

Matthew J Takorski
Printed Name

Emissions Units

AIR OPERATING PERMIT RENEWAL APPLICATIONS

Emissions Unit Name	Significant or Insignificant (S or I) WAC 173-401-530	Existing Permit Condition Number	Potential to Emit of Each Pollutant for Unit as if the Control Device is Not Considered	CAM needed? If yes, provide copy of CAM plan
EU1 (Wood fired Boiler)	S	5.1	NOx - 135 T/Y	
EU1	S	5.1	CO - 475 T/Y	
EU1	S	5.1	SO_2 - 33.9 T/Y	
EU1	S	5.1	PM_{10} - 27.0 T/Y	CAM
EU1	S	5.1	VOC - 33.9 T/Y	
EU1	S	5.1	Acetaldehyde - 2.22E-01 T/Y	
EU1	S	5.1	Acrolein - 4.28E-02 T/Y	
EU1	S	5.1	Ammonia - 85.5 T/Y	
EU1	S	5.1	Antimony - 3.11E-02 T/Y	
EU1	S	5.1	Arsenic - 7.61E-03 T/Y	
EU1	S	5.1	Benzene - 1.01 T/Y	
EU1	S	5.1	Beryllium - 2.10 E-03 T/Y	
EU1	S	5.1	Bromomethane - 3.80E-02 T/Y	
EU1	S	5.1	Cadmium - 3.93E-03 T/Y	
EU1	S	5.1	Carbon Tetrachloride - 6.16E-02 T/Y	
EU1	S	5.1	Chlorobenzene - 4.50E-02 T/Y	
EU1	S	5.1	Chloroform - 3.73E-02 T/Y	
EU1	S	5.1	2-Chlorophenol - 4.57E-05 T/Y	
EU1	S	5.1	Chromium (vi) - 4.23E-03 T/Y	
EU1	S	5.1	Chromium (iii) - 2.08E-03 T/Y	
EU1	S	5.1	Cobalt - 1.69E-04 T/Y	

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EU1 (Wood fired boiler)	S	5.1	Copper - 1.01E-02 T/Y	
EU1	S	5.1	1,2-Dichloroethane - 3.96E-02 T/Y	
EU1	S	5.1	Dichloromethane - 3.89E-01 T/Y	
EU1	S	5.1	1,2-Dichloropropane - 4.52E-02 T/Y	
EU1	S	5.1	Ethylbenzene - 4.24E-02 T/Y	
EU1	S	5.1	Formaldehyde - 2.33 T/Y	
EU1	S	5.1	Hexane - 8.89E-01 T/Y	
EU1	S	5.1	Hydrogen Chloride - 4.75 T/Y	
EU1	S	5.1	Lead - 6.71E-02 T/Y	
EU1	S	5.1	Manganese - 1.33E-01 T/Y	
EU1	S	5.1	Mercury - 5.64E-04 T/Y	
EU1	S	5.1	Naphthalene - 1.28E-01 T/Y	
EU1	S	5.1	Nickel - 3.43E-03 T/Y	
EU1	S	5.1	Nitric Oxide - 92.0 T/Y	
EU1	S	5.1	Pentachlorophenol - 3.08E-05 T/Y	
EU1	S	5.1	Phenol - 1.70E-02 T/Y	
EU1	S	5.1	Selenium - 2.36E-03 T/Y	
EU1	S	5.1	TCDD - Total - 2.77E-07 T/Y	
EU1	S	5.1	Tetrachloroethane - 5.18E-02 T/Y	
EU1	S	5.1	Tin - 8.99E-03 T/Y	
EU1	S	5.1	Toluene - 2.88E-02 T/Y	

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EU1 (Wood fired boiler)	S	5.1	1,1,1 - Trichloroethane - 4.17E-02 T/Y	
EU1	S	5.1	Trichloroethane - 4.11E-02 T/Y	
EU1	S	5.1	Trichlorofluoromethane - 5.49E-02 T/Y	
EU1	S	5.1	2,4,6 - Trichlorophenol - 1.54E-05 T/Y	
EU1	S	5.1	Vanadium - 1.84E-03 T/Y	
EU1	S	5.1	Vinyl Chloride - 2.49E-02 T/Y	
EU1	S	5.1	o-Xylene - 3.32E-02 T/Y	
EU1	S	5.1	Benzo(a)anthracene - 7.53E-07 T/Y	
EU1	S	5.1	Benzo(a)pyrene - 1.01E-06 T/Y	
EU1	S	5.1	Benzo(b)fluoranthene - 7.49E-07 T/Y	
EU1	S	5.1	Benzo(k)fluoranthene - 7.37-07 T/Y	
EU1	S	5.1	Chrysene - 8.69E-07 T/Y	
EU1	S	5.1	Dibenzo(a,h)anthracene - 7.27E-07 T/Y	
EU1	S	5.1	Indeno(1,2,3-c,d)pyrene - 7.35E-07 T/Y	
EU2 (Cooling Tower)	S	5.2	PM_{10} - 0.043 T/Y	
EU3 (Backup Diesel Generator)	S	5.3	NO_x - 1.9 T/Y	
			CO - 0.45 T/Y	
			SO_2 - 0.031 T/Y	
			PM_{10} - 0.065 T/Y	

Emissions Units

AIR OPERATING PERMIT RENEWAL APPLICATIONS

Emissions Unit Name	Significant or Insignificant (S or I) WAC 173-401-530	Existing Permit Condition Number	Potential to Emit of Each Pollutant for Unit as if the Control Device is Not Considered	CAM needed? If yes, provide copy of CAM plan
EU3 (Backup Diesel Generator)	S	5.3	VOC - 0.035 T/Y	

COMPLIANCE ASSURANCE MONITORING PLAN
SIERRA PACIFIC INDUSTRIES, ABERDEEN DIVISION
ELECTROSTATIC PRECIPITATOR

I. Background

A. Emissions Unit

Description:	Hog fuel boiler with natural gas used as a secondary fuel
Identification:	Boiler may be identified as emission point EU1
APCD ID:	ESP1
Facility:	Sierra Pacific Industries – Aberdeen Division Aberdeen, Washington

B. Applicable Regulation, Emissions Limit, and Monitoring Requirements

Regulation:	PSD-02-02; NOC# 02NOC234
Emissions Limits:	
PM:	0.02 pounds per million British thermal units (24-hour average)
PM:	0.01 grains per dry standard cubic foot (24-hour average – not a permit limit, but roughly equivalent to other limits)
PM	27 tons per year (12-month average)
Current monitoring requirements:	Maintain and operate continuous opacity monitoring system (COMS)

C. Control Technology: Electrostatic precipitator.

II. Monitoring Approach

The key elements of the monitoring approach, including the indicators to be monitored, indicator ranges, and performance criteria are presented in Table 1 and Table 2.

TABLE 1. OPACITY MONITORING APPROACH

I. Indicator	Opacity is used as an indicator of ESP performance.
Measurement Approach	A continuous opacity monitor (COM) provides continuous information to boiler operators to confirm proper operation of the ESP.
II. Indicator Range	An excursion is defined as an hourly opacity average above 7% averaged over a six-minute period. Excursions trigger an inspection, corrective action, and a reporting requirement.
III. Performance Criteria A. Data Representativeness	More than 15 years of operating experience with a COM have demonstrated that opacity is an excellent indicator of ESP performance.
B. Verification of Operational Status	Displays in boiler control room confirm COM operational status.
C. QA/QC Practices and Criteria	Confirm the meters read zero when the unit is not operating. The COM is checked quarterly and calibrated as appropriate
D. Monitoring Frequency	Continuous monitoring by COM. Frequent visual observations of stack opacity by non-certified plant personnel.
Data Collection Procedures	COM observations are continuously recorded.
Averaging period	6 minutes

TABLE 2. ESP MONITORING APPROACH

I. Indicator	Secondary voltage (to transformer/rectifier [T/R]) is measured for each field to ensure that proper conditions exist in each field for particulate matter collection.
Measurement Approach	The secondary voltage to each T/R is monitored daily and recorded to confirm proper operation of the ESP. High and low voltage alarms for the operators are present in the control room.
II. Indicator Range	An excursion is defined as when the voltage to one or more of the transformer rectifier (T/R) sets is above 55 kilovolts or less than 10 kilovolts. Excursions trigger an inspection, corrective action, and a reporting requirement.
III. Performance Criteria A. Data Representativeness	The voltages are measured using the instrumentation the manufacturer provided with the ESP. The maximum and minimum allowable T/R voltages (alarm set points) are based on manufacturer recommended values.
B. Verification of Operational Status	Daily recording of T/R voltages and displays in boiler control room confirm operational status.
C. QA/QC Practices and Criteria	Confirm the meters read zero when the unit is not operating. Follow O&M manual for ESP.
D. Monitoring Frequency	Continuous monitoring by alarm and daily recording of T/R voltages.
Data Collection Procedures	Continuous monitoring by alarm and daily recording of T/R voltages.
Averaging period	Daily

I. Background

The pollutant-specific emission unit is a 3-field ESP controlling a wood waste-fired boiler. The boiler may also be fired with natural gas at up to 310 MMBtu/hr, but gas is primarily used for startup and to maintain good combustion. The boiler is rated at 160,000 pounds of steam per hour. The boiler is subject to New Source Performance Standard (NSPS) Subpart Db. The boiler normally is operated at full capacity, and most emission tests have been performed at or near full load. The boiler is not a "large" CAM source (the post-control PM emissions are less than 100 tons per year) so continuous monitoring is not required. However, a Continuous Opacity Monitor (COM) was required as a condition of its 2002 NOC permit and for compliance with the requirements of NSPS Subpart Db.

A two-stage control system ensures compliance with permit limits for particulate matter (PM) mass emissions limits. Large particles are removed in a mechanical collector (a "multiclone" cyclone separator). This initial stage of particle control removes about 70 percent of the particulate matter mass emissions. These larger particles and char are typically reinjected into the boiler to improve fuel efficiency and to reduce ash generation. An induced draft fan pulls flue gas through the multiclone and into a 42,263 square foot, three-field ESP designed by PPC Industries. The maximum power consumption of the ESP is 190 kW. The combined PM control (multiclone and ESP) is at least 99 percent.

After passing through the ESP, boiler exhaust gases are emitted from a 100-foot tall, 7-foot 2-inch diameter stack. Stack sampling test ports and an opacity monitor are located about half way up the stack.

The facility's Air Operating Permit identifies a variety of monitoring and record-keeping requirements. It also requires the development and use of an Operations and Maintenance Plan for both the multi-clone and the ESP. That O&M plan is attached.

II. Rationale for Selection of Performance Indicators

Although the performance of an ESP can be assured by providing sufficient power to each field, SPI has never conducted tests that reveal the minimum power requirements needed to ensure compliance with the mass emission limit. As noted below, recent source tests have demonstrated that the facility meets its PM emission limit and its opacity limit, but neither test evaluated mass emissions as a function of power input to the ESP. Indicators in the control room identify problems with the ESP electrical systems and with opacity excursions, but there is no absolute means of quantifying PM mass emissions in real time.

In an ESP, electric fields are established by applying a direct-current voltage across a pair of electrodes, a discharge electrode and a collection electrode. Particulate matter suspended in the gas stream is electrically charged by passing through the electric field around each discharge electrode (the negatively charged electrode). The negatively charged particles then migrate toward the positively charged collection electrodes. The particulate matter is separated from the gas stream by retention on the collection electrode. Particulate is removed from the collection plates by shaking or rapping the plates.

As a general rule, ESP performance improves as total power input increases. This relationship is true when particulate matter and gas stream properties (such as PM concentration, size distribution, resistivity, and gas flow rate) remain stable and all equipment components (such as rappers, plates, wires, hoppers, and transformer-rectifiers) operate satisfactorily. The secondary voltage decreases when a malfunction, such as grounded electrodes, occurs in the ESP. When the secondary voltage drops, less particulate is charged and collected. Monitoring the secondary voltage helps ensure that proper conditions exist in each field for particulate collection.

SPI believes that opacity is a better indicator of ESP performance and mass emissions than measuring ESP parameters. Problems that would be detected by anomalies in power input will also be manifested in the opacity observations. Monitoring the voltages to the T/R sets will help track ESP performance, while the control room alarms will help identify potential operational problems with the ESP fields.

III. Rationale for Selection of Indicator Ranges

An ESP excursion is defined as two or more of the ESP T/R sets have voltages that are outside the acceptable voltage range (above minimum acceptable voltage and below maximum acceptable voltage) and a six-minute COM opacity reading exceeding ten percent. When an excursion occurs, corrective action will be initiated, beginning with an evaluation of the occurrence to determine the action required to correct the situation. All excursions will be documented and reported.

If the COM is not functioning, plant personnel will evaluate opacity visually once per shift. If there is a visible plume not attributable to water, plant personnel will consider that an excursion. When an excursion occurs, corrective action will be initiated, beginning with an evaluation of the occurrence to determine the action required to correct the situation. All opacity excursions will be documented and reported.

The 7 percent opacity criterion was selected based upon more than 15 years of operating experience and the current permit limit for opacity. SPI personnel know that opacity limits are virtually always less than 5 percent when the ESP is operating properly. Table 3 indicates that concurrent observations of opacity and mass emissions from a recent source test indicate that opacity levels of 1 percent or less correspond with mass emissions that are about 50 percent or less of the mass emissions limit.

TABLE 3. PM10 SOURCE TEST SUMMARY

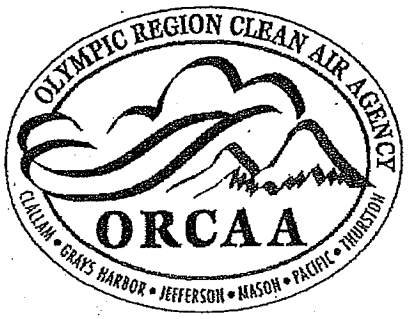
Date of Test	Time of Test	Gas Flow Rate (scfm)	PM10 Conc.[a] (gr/dscf)	Emission Factor (lb/MMBtu)	Annual Emissions (tons/yr)	Opacity (%)
8/12/03	0945-1150	57,628	0.003	0.006	7.18	1.2
8/12/03	1305-1515	59,874	0.005	0.010	12.18	0.9
8/12/03	1555-1800	59,182	0.001	0.003	3.10	0.9
Average	---	58,895	0.003	0.006	7.49	1.0
Permit Limits			*0.01*[b]	*0.02*	*27*	*10*

a. Concentrations are corrected to seven percent oxygen.
b. Not a permit condition, but roughly equivalent to the 0.02 lb/MMBtu permit limit.

Although we do not have concurrent opacity measurements during the most recent source test, PM10 emissions were found to be less than five percent of the mass emissions limit even when the boiler was operating at near capacity. This test confirms that the properly functioning ESP results in mass emission limits that are below permit limits, and that a wide margin of safety is present.

The performance indicator ranges for the ESP T/R are the maximum and minimum allowable T/R voltages (alarm set points) based on manufacturer recommended values. These T/R voltages are:

Minimum T/R voltage: 10 kilovolts
Maximum T/R voltage: 55 kilovolts



Air Quality Operating Permit Renewal Application and Instructions