PREVENTION OF SIGNIFICANT DETERIORATION (PSD) PERMIT

Issued To:	Energy Northwest 3000 George Washington Way Richland, WA 99352
Facility Location:	Kalama Energy Center, LLC North Port Marine Industrial Park–Port of Kalama Kalama, Washington 98625
Permit Number:	**PSD-11-04, Proposed**
Date of Original Permit Issuance:	**[Insert issuance date]**
Effective Date of Permit:	**[Insert Effective date]**

This PSD permit is issued under the authority of the Washington State Clean Air Act, Chapter 70.94 Revised Code of Washington; the Washington State Department of Ecology regulations for the Prevention of Significant Deterioration of Air Quality as set forth in Washington Administrative Code 173-400-700 through 750; and the agreement for the delegation of the federal Prevention of Significant Deterioration regulations by the United States Environmental Protection Agency to the Washington State Department of Ecology, dated November 17, 2011.

REVIEWED BY:

_____ _____

Robert C. Burmark, P.E. Date
Science and Engineering Section
Air Quality Program

APPROVED BY:

_____ _____

Stuart A. Clark Date
Air Quality Program Manager
Washington State Department of Ecology

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PROJECT SUMMARY

Energy Northwest proposes to construct and operate the Kalama Energy Center electrical power generating facility. Natural gas would fuel a combined-cycle combustion turbine generating plant to provide electricity for intermediate-loads and renewable-shaping services. The Kalama Energy Center's nominal net output would be approximately 346 megawatts electrical (MWe) at design (i.e., average ambient) conditions. The facility would be designed to include a nominal 309 MWe from the combustion turbine and steam turbine, and a nominal 37 MWe of additional capacity through duct firing. The facility's maximum net output capacity under design conditions will be less than 350 MWe.

The electric power generating facility would have a combustion turbine generator (CTG) and a steam turbine generator (STG). The expansion of hot combustion gases inside the combustion turbine creates rotational energy that spins the generator and produces electricity. The hot exhaust gases exiting the CTG pass through a heat recovery steam generator (HRSG), a type of boiler where steam is produced. The resulting steam is piped to a steam turbine that is connected to an electric generator. The expansion of steam inside the steam turbine spins the generator to produce electricity.

From an air pollution perspective, the key components of the Kalama Energy Center are:

- One combustion turbine
- One HRSG with duct burners
- One auxiliary boiler
- One cooling tower
- One diesel-powered backup generator
- One diesel-powered emergency fire pump
- Five circuit breakers containing sulfur hexafluoride (SF_6)

The proposed project is expected to emit nitrogen oxides (NO_X), carbon monoxide (CO), particulate matter and particulate matter less than 10 and 2.5 microns in diameter ($PM/PM_{10}/PM_{2.5}$ are all considered to be equal and smaller than $PM_{2.5}$ for this permit), volatile organic compounds (VOC), and greenhouse gases (GHG) at rates greater than their Prevention of Significant Deterioration (PSD) significance thresholds.

The emissions of other air pollutants not subject to PSD review will be covered in the Southwest Clean Air Agency (SWCAA) Notice of Construction (NOC) approval for this project.

A full technical review of the project, including a Best Available Control Technology (BACT) analysis, and the project's effect on National Ambient Air Quality Standards (NAAQS), PSD increments, visibility, soils, and vegetation, is included in a Technical Support Document (TSD) prepared by the Washington State Department of Ecology (Ecology) issued on July 30, 2012.

APPROVAL CONDITIONS

Based on the PSD permit application submitted by Energy Northwest on June 30, 2011, the additional information submitted on October 3, 2011, November 3, 2011, December 8, 2011, February 14, 2012, and the technical review performed by Ecology, Ecology finds that all requirements for issuance of this PSD permit have been satisfied. Ecology found that the application was complete as of August 4, 2011. Approval of the project described above is granted subject to the following conditions:

I. EFFECTIVE DATE OF PERMIT

In accordance with the Washington Administrative Code (WAC) 173-400-730(2), the effective date of this PSD permit is one of the following dates:

A. If no comments on the preliminary determination were received: the date of issuance.

B. If comments were received: thirty (30) days after the applicant and the commenters receive the final determination.

C. If a review of the final determination is requested pursuant to WAC 173-400-730(4), the effective date of this permit is suspended until such time as the review and any subsequent appeal against this permit are resolved.

II. PERMIT EXPIRATION

Pursuant to WAC 173-400-730(5), and unless an extension is requested prior to expiration, this PSD permit will become invalid if construction:

A. Has not commenced (as defined in 40 CFR § 52.21(b)(9)) within eighteen (18) months of the effective date of this permit.

B. Is discontinued for a period of eighteen (18) months or more.

C. Is not completed within a reasonable time.

III. PERMIT NOTIFICATION REQUIREMENTS

A. Most Permittee's requirements in this PSD permit to notify, report to, or acquire approval or agreement from "Ecology and/or the Southwest Clean Air Agency (SWCAA)" may be satisfied by providing such notification, reporting, or approval request to SWCAA if the conditions of this PSD permit have been incorporated into the Kalama Energy Center's Title V Air Operating Permit issued pursuant to WAC 173-401. A request to change a permit condition requires Ecology approval.

B. Permittee must notify Ecology and SWCAA in writing or electronic mail of the:

1. Date construction is commenced, postmarked or received no later than thirty (30) days after such date.

2. Anticipated date of initial start-up of the combustion turbine not more than sixty (60) days nor less than thirty (30) days prior to such date. For the purpose of this permit, initial start-up occurs when fuel is first introduced to the subject combustion turbine.

3. Actual date of initial start-up of the combustion turbine, postmarked or received no later than fifteen (15) days of the date.

4. Actual date of commercial start-up of the turbine, postmarked within fifteen (15) days of the date.

5. The date construction of the auxiliary boiler is commenced, postmarked no later than thirty (30) days after such date. Notification shall include the design heat input capacity, identification of fuels to be combusted, and the anticipated annul capacity factor.

6. The actual date of initial start-up of the auxiliary boiler, postmarked within fifteen (15) days after such date. Notification shall include the design heat input capacity, identification of fuels to be combusted, and the anticipated annual capacity factor.

IV. EQUIPMENT AND FUEL RESTRICTIONS

A. This PSD permit allows for the discharge of air contaminants from the following equipment:

Equipment/Activity	Equipment Description
1. Combustion turbine	• One Siemens SGT6-5000F(4) combustion turbine with a maximum heat input rate of 2,247 MMBtu/hr (HHV) that is vented to the HRSG. • Emissions of NO_X controlled by dry low-NO_X combustors.
2. HRSG	• One HRSG with supplemental duct burners with a combined nominal heat input of up to 281 MMBtu/hr (HHV). • Emissions of NO_X controlled by SCR, and emissions of CO controlled by an oxidation catalyst.
3. Auxiliary boiler	• One auxiliary boiler with a maximum heat input rate of 36.5 MMBtu/hr (HHV). • NO_2 emissions controlled by ultra low-NO_X burners.
4. Cooling tower	• One 6-cell cooling tower.

Equipment/Activity	Equipment Description
	• 73.5 million lb/hr (MMlb/hr) maximum water circulation rate. • High efficiency (0.0005% of circulation rate) drift eliminators control particulate emissions.
5. Emergency generator engine	• One diesel-fired Internal Combustion (IC) engine, rated at nor more than 1,227 brake horsepower (bhp). • Certified to meet EPA Tier II emission standards of 40 CFR § 89.112 for the year of purchase except that NO_X to be certified to meet the 2.6 g/hp-hr* Tier IV interim standard.
6. Emergency fire pump engine	• One diesel-fired IC engine rated at nominally 240 bhp or less. • Complies with 40 CFR Part 60, Subpart IIII emission standards for fire pumps for the year of purchase.
7. SF_6 circuit breakers	• Five enclosed-pressure SF_6 circuit breakers. • 0.5% (by weight) maximum annual leakage rate design. • Leak detection system.
* Grams per horsepower hour	

B. Air Pollution Control Equipment and Operation

1. On or before the date of initial start-up of the emission units identified in Condition IV.A.1 and IV.A.2., and thereafter, except during periods of start-up and shutdown as provided for in Condition V.A.4, the Permittee shall install, continuously operate, and maintain a selective catalytic reduction (SCR) system for control of NO_X emissions and an oxidation catalyst for control of CO emissions from the unit identified in Condition IV.A.2.

C. Fuel Requirements

1. The combustion turbine, the duct burner, and the auxiliary boiler shall combust only natural gas.

2. The auxiliary boiler may combust a maximum of 159,870 MMBtu natural gas per rolling 12-month period.

3. The emergency generator engine and fire pump engine shall combust only ultra low sulfur diesel fuel with a sulfur content of 15 parts per million (ppm) or lower. A fuel certification from the fuel supplier may be used to demonstrate compliance with this requirement.

D. Stack Parameters

1. The final exhaust stack parameters shall comply with the following nominal dimensions:

Equipment	Minimum Stack Height (ft)	Stack Exit Point Maximum Inside Diameter (ft)
a. Combustion turbine generator/HRSG	140	20
b. Cooling tower	48	33
c. Emergency generator engine	28	0.67
d. Emergency fire pump engine	28	0.42
e. Auxiliary boiler	85	2.75

2. Within 180 days after initial start-up of the facility, the Permittee shall determine the actual stack exit point dimensions and certify in writing to Ecology and/or SWCAA, as specified in Condition III.A., that the exhaust stack dimensions comply with the nominal values in Condition IV.D.1.

   a. The certification required by Condition IV.D.1. shall contain the actual heights and diameters of the stacks as built. A copy of this certification shall be retained on-site and be made available for inspection by the United States Environmental Protection Agency (EPA), Ecology, or SWCAA upon request.

V. EMISSION LIMITS

Specific operating requirements, compliance monitoring requirements, and emission monitoring and testing requirements for Conditions A, B, C, D, and E of this section are given in Sections VI, VII, and VIII, respectively.

A. Combustion Turbines HRSG Emission Limits

1. Consistent with the requirements of 40 CFR § 52.21(j), (BACT), the Permittee shall not discharge or cause the discharge of emissions into the atmosphere from the Combustion Turbine/HRSG system in excess of the following, except during periods of start-up and shutdown, which are provided for under Condition V(A)(3), or during the turbine shakedown period as defined in Section X.C:

Pollutant	Emission Limit	Averaging Period
a. NO_X	2.0 ppmvd @ 15% O_2 18.5 lb/hr	1-hr average 1-hr average
b. CO	2.0 ppmvd @ 15% O_2 11.3 lb/hr	1-hr average 1-hr average
c. VOC	1.0 ppmvd @ 15% O_2 3.2 lb/hr	1-hr average 1-hr average
d. $PM/PM_{10}/PM_{2.5}$	17.1 lb/hr 0.0068 lb/MMBtu	3-hr average 3-hr average

2. Including periods of start-up and shutdown, the Permittee shall not discharge or cause the discharge of emissions into the atmosphere from the Combustion Turbine/HRSG system in excess of:

Pollutant	Emission Limit	Averaging Period
a. NO_X	15 ppmvd @ 15% O_2 102.4 tpy	30-day average, per 40 CFR Part 60, Subpart KKKK 12-mo rolling total
b. CO	131.1 tpy	12-mo rolling total
c. VOC	47.8 tpy	12-mo rolling total
d. $PM/PM_{2.5}$	70.0 tpy	12-mo rolling total
e. GHGs (CO_2e)	858 lb/MWhe 1,204,060 tpy	12-mo rolling average 12-mo rolling total

3. Additional requirements during combustion turbine start-up and shutdown

   a. Start-up is defined as the period beginning with ignition and lasting until either the equipment complies with all normal operation permit limits or the maximum time allowed for the event, whichever occurs first.

      i. Cold start-ups include all start-ups that begin 64 or more hours after the previous shutdown.

      ii. Warm start-ups include all start-ups that begin less than 64 hours and more than 16 hours since the previous shutdown.

      iii. Hot start-ups include all start-ups that begin 16 or less hours since the last shutdown.

   b. Shutdown is defined as the period beginning with the lowering of equipment from normal operating load and lasting until fuel flow is completely off and combustion has ceased.

   c. The duration and frequency of the combustion turbine and associated HRSG unit start-up and shutdown events shall not exceed:

	Cold Start-Up	Warm Start-Up	Hot Start-Up	Shutdown
i. Duration	1-hr/event	1-hr/event	1-hr/event	1-hr/event
ii. Frequency limit	730 start-up events/calendar year			
Emission Limits				
iii. NO_X	135 lb/event	138 lb/event	137 lb/event	60 lb/event
iv. CO	600 lb/event	357 lb/event	343 lb/event	112 lb/event
v. VOC	182 lb/event	143 lb/event	137 lb/event	46 lb/event

d. NO_X and CO emissions during periods of start-up and shutdown shall be determined from Continuous Emissions Monitoring System (CEMS) data if emissions are within the measurement range of the CEMS. NO_X and CO emissions that exceed the CEMS measurement ranges shall be estimated by vendor supplied emission factors; source test data; or other methods approved by SWCAA and Ecology.

e. VOC emissions during periods of start-up and shutdown shall be estimated by vendor supplied emission factors; source test data; or other methods approved by SWCAA and Ecology.

f. The Permittee must record the start time, date, and duration of each start-up and shutdown event. The records must identify the quantity of NO_X, CO, and VOC emissions during each event.

g. The SCR system, including ammonia injection, shall be operated in a manner to minimize emissions, as early in the start-up as technologically feasible, but not later than when the combustion turbine reaches 50 percent of maximum heat input.

B. Auxiliary Boiler Emission Limits

1. At all times, including equipment start-up and shutdown, Permittee shall not discharge or cause the discharge of emissions from the auxiliary boiler into the atmosphere in excess of the following:

Pollutant	Emission Limit 1	Emission Limit 2	Averaging Period
a. NO_X	12 ppmvd @ 3% O_2	0.54 lb/hr	1-hr average
b. CO	30 ppmvd @ 3% O_2	0.81 lb/hr	1-hr average
c. $PM_{10}/PM_{2.5}$		0.28 lb/hr	1-hr average
d. GHG (as CO_2e) Natural gas fuel		9,353 tpy 159,870 MMBtu	12-mo rolling total 12-mo rolling total

C. Cooling Tower Emission Limits

1. The cooling tower drift rate shall not exceed 0.0005 percent with a maximum circulation rate of 73 million pounds/hour; and the total dissolved solids (TDS) shall not exceed 2,400 ppm averaged over a calendar month.

2. Particulate matter emissions from cooling tower drift shall not exceed 0.88 lb/hr averaged over a calendar month, and 3.9 tons per year (tpy). All particulate matter emissions from cooling tower drift shall be considered $PM_{2.5}$.

3. Annual emissions of particulate matter from cooling tower drift shall be determined using a manufacturer supplied drift factor and measurements of TDS in the cooling water discharge per Conditions VII.C.2 and VIII.B.2. The TDS value used to calculate annual emissions shall be the average of the TDS results from all sampling performed during the annual period.

D. Emergency Generator and Emergency Fire Pump Emission Limits

1. The emergency generator engine shall be:

   a. Nominally rated 1,227 bhp or less.

   b. Certified to not exceed its applicable EPA Tier II standard, with the exception that,

   c. Its NO_X emissions shall be certified by the manufacturer to not exceed 2.6 g/hp-hr.

2. The fire pump engine shall be:

   a. Nominally rated at 240 bhp or less.

   b. Certified to not exceed its applicable 40 CFR Part 60 Subpart IIII emission standards for fire pumps.

3. Compliance with Conditions V.D.1 and V.D.2 shall be determined by:

   a. A written manufacturer supplied certification for each engine.

   b. Maintaining the engine according to manufacturer's recommendations.

   c. Records of the engine run times, duration, and purpose of each use.

4. GHG (CO_2e) emissions associated with maintenance and testing shall not exceed the following:

Engine	Limit (tons)	Averaging Period
Generator	33.6	12-mo rolling total
Fire pump	7.1	12-mo rolling total

E. Circuit Breakers

The circuit breakers shall:

1. Be of a pressure-enclosed design with a maximum annual leakage rate of 0.5 percent.

2. Have a leak detection system that meets the requirements of Condition VIII.B.3.a.

VI. SPECIFIC OPERATING REQUIREMENTS

A. Combustion Turbine, Duct Burners, and Auxiliary Boiler

1. The auxiliary boiler shall utilize an oxygen trim system or SWCAA and/or Ecology-approved equivalent to assure proper combustion conditions and efficiency across the full range of load conditions under which the auxiliary boiler is operated.

2. The auxiliary boiler shall be equipped with a non-resettable fuel meter to monitor total fuel consumption.

   If the test results from any performance monitoring event for the auxiliary boiler indicate that emission concentrations may exceed 12 ppmvd NO_X @ 3 percent O_2 or 30 ppmvd CO @ 3 percent O_2, the Permittee shall either perform 60 minutes of additional monitoring to more accurately quantify CO and NO_X emissions, or initiate corrective action. Additional testing or corrective action shall be initiated as soon as practical but no later than three days after the potential exceedance is identified. Corrective action includes tuning, maintenance by service personnel, limitation of boiler load, or other action taken to maintain compliance with permitted limits. Monitoring of unit emissions must be conducted within three days following completion of any corrective action to confirm that the corrective action has been effective. Corrective action shall be pursued until observed emission concentrations no longer exceed 12 ppmvd NO_X or 30 ppmvd CO, corrected to 3 percent O_2.

B. Emergency Generator Engine and Emergency Fire Pump Engines

1. Operation of the emergency generator engine and emergency fire pump engine shall be limited to maintenance checks, readiness testing, and as necessary to provide emergency power or emergency fire water pumping.

2. Operation of the emergency generator engine and emergency fire pump engine for maintenance checks and readiness testing shall not exceed 52 hours per 12-month rolling period each, and a total of 275 hours each per 12- month rolling period for all purposes. A non-resettable time totalizer shall be installed on each engine and used to measure hours of operation.

3. The emergency generator engine and the emergency fire pump engine may not be operated at the same time for maintenance checks and readiness testing.

VII. COMPLIANCE MONITORING REQUIREMENTS

A. The hourly average of the following data for the Combustion Turbine/HRSG exhaust stack shall be recorded by an automated data acquisition system and readily available on-site for inspection:

1. NO_X (ppmvd @ stack O_2).
2. NO_X (ppmvd @ 15 percent O_2).
3. CO (ppmvd @ stack O_2).
4. CO (ppmvd @ 15 percent O_2).
5. O_2 concentration (dry volume percent).
6. Combustion turbine fuel consumption.
7. Duct burner fuel consumption.
8. Combustion turbine generator and steam turbine generator gross output and facility net electrical output (megawatts).

B. All data collected to comply with Condition VII.A. shall be readily identifiable (i.e., appropriately labeled) in the record. All periods of monitor downtime shall be clearly identified.

C. The following information shall be collected, recorded at the intervals specified below, and readily available on-site for inspection:

1. The results of all CEMS calibrations and quarterly cylinder gas audits shall be recorded for each occurrence.

2. The cooling water discharged from the cooling tower shall be analyzed for TDS at least each calendar week when operating, and the results of the analysis recorded for each sampling event.

3. The amount of water circulated through the cooling towers shall be recorded for each calendar month.

4. Hourly (averaged over a calendar month) and annual emission rates of $PM/PM_{10}/PM_{2.5}$ from cooling tower drift shall be determined using a manufacturer supplied drift factor and measurements of TDS in the cooling water discharge. The TDS value used to calculate the monthly average hourly emissions rate shall be the result of the most recent cooling water discharge

analysis. The TDS value used to calculate annual emissions shall be the average of the TDS results from all sampling performed during the annual period.

5. The amount of natural gas combusted by the auxiliary boiler shall be recorded for each calendar month.

6. The number of hours the emergency generator engine operated shall be recorded for each calendar month.

7. The number of hours the emergency fire pump engine operated shall be recorded for each calendar month.

8. The fuel sulfur content of the diesel burned in the emergency generator engine and the emergency fire pump engine shall be determined and recorded for each fuel delivery. A fuel supplier certification may be used in lieu of actual fuel testing.

9. Maintenance and repair activities that may affect emissions from the combustion turbine, duct burners, auxiliary boiler, cooling tower, emergency generator engine, and emergency fire pump engine shall be recorded for each occurrence.

10. Maintenance and repair activities for emission control systems (e.g., catalytic oxidation system, SCR system) and CEMS shall be recorded for each occurrence.

VIII. EMISSION MONITORING AND TESTING REQUIREMENTS

A. CEMS for the Combustion Turbine/HRSG System

1. Permittee shall install, calibrate, operate, maintain, certify, and quality-assure a CEMS for the Combustion Turbine/HRSG system that measures stack gas NO_X , CO, and O_2 concentrations in ppmv. The NO_X and CO concentrations shall be correctable to 15 percent O_2 on a dry basis.

2. The NO_X and O_2 CEMS shall meet the applicable requirements of 40 CFR Part 60, Appendix B, Performance Specifications 2 and 3, and 40 CFR Part 60, Appendix F, Procedure 1. Alternatively, the NO_X CEMS may meet the installation and certification requirements of 40 CFR Part 75.

3. The CO CEMS shall meet the applicable requirements of 40 CFR Part 60, Appendix B, Performance Specification 4, and 40 CFR Part 60, Appendix F,

Procedure 1, except the relative accuracy specified in Section 13.2 of 40 CFR Part 60 Appendix B, Performance Specification 4 shall not exceed 20 percent.

4. CEMS shall meet the requirements of 40 CFR § 60.13. Data sampling, analyzing, and recording shall also be adequate to demonstrate compliance with emission limits during start-up and shutdown.

5. No later than 90 days prior to the date of initial start-up of the Facility, the Permittee shall submit to Ecology and/or SWCAA, as specified in Condition III.A., a quality assurance project plan for the certification and operation of the continuous emission monitors. The plan shall be updated and resubmitted upon request by Ecology and/or SWCAA. The protocol shall specify how emissions during start-ups and shutdowns will be determined and calculated, including quantifying flow accurately if calculations are used.

6. The Combustion Turbine/HRSG system CEMS shall be tested annually and audited quarterly in accordance with the requirements of 40 CFR Part 60, Appendix F, Procedure 1.

7. Permittee shall submit a CEMS performance test protocol to Ecology and/or SWCAA, as specified in Condition III.A., no later than 30 days prior to the test date.

8. Permittee shall furnish Ecology and/or SWCAA, as specified in Condition III.A., a written report of the results of performance tests within 60 days of completion.

9. Permittee shall measure and record the hourly fuel consumption by the Combustion Turbine/HRSG (including duct burners) system.

10. Permittee shall measure and record, for the Combustion Turbine/HRSG/Steam Turbine system, the following:

    a. Net energy output (MWh) on an hourly basis.
    b. Net heat rate (Btu/kWh) on an hourly average basis.
    c. Tons CO_2 emitted on an hourly basis.

B. Performance Tests

1. Stack testing

    a. Emissions testing of the Combustion Turbine/HRSG system and the auxiliary boiler shall be conducted as follows:

i. Within 60 days after initial commercial operation, but not later than 180 days after the initial start-up of equipment, and unless otherwise specified, annually thereafter (within 30 days of the initial performance test anniversary), Permittee shall conduct performance tests (as described in 40 CFR § 60.8) to measure NO_X, CO, VOC, and PM,/PM_{10}/$PM_{2.5}$ emissions from the Combustion Turbine/HRSG system in accordance with Conditions VIII.B.1.b through h. of this permit. Performance tests conducted to satisfy initial CEMS certification and annual Relative Accuracy Test Audit (RATA) requirements shall also satisfy performance testing requirements for NO_X and CO.

ii. Once three consecutive years of tests on the Combustion Turbine/HRSG stack have indicated compliance with the PM/PM_{10}/$PM_{2.5}$ mass limit and the VOC limits, the stack shall be tested at least once every five calendar years. If a once every 5-year test indicates noncompliance, the testing frequency reverts to yearly until three consecutive years of testing indicating compliance is achieved.

iii. Initial performance testing of the auxiliary boiler shall be conducted within 60 days of initial commercial operation of the facility. Additional performance testing of the auxiliary boiler shall be conducted at least once every five years (within 30 days of the initial performance test anniversary) in accordance with Conditions VIII.B.1.b. through h. of this permit.

iv. Performance monitoring of the auxiliary boiler shall be conducted at least annually (at least once every 12 months following the initial performance test) as described in Appendix A of this permit. Performance monitoring is not required in any year during which source emissions testing of the unit is conducted in accordance with Condition VIII.B.1.a.ii.

b. The performance tests shall be conducted in accordance with the requirements of 40 CFR Part 60, Appendix F, Procedure 1, Section 5.11.

c. Permittee shall submit a performance test protocol to Ecology and/or SWCAA, as specified in Condition III.A., no later than 30 days prior to the test. The performance test shall be conducted in accordance with the submitted protocol, and any changes required by Ecology and/or SWCAA.

d. Performance tests shall be conducted in accordance with the test methods set forth in 40 CFR § 60.8 and 40 CFR Part 60, Appendix A, as modified

below. In lieu of the specified test methods, alternative methods may be used with prior written approval from Ecology and SWCAA:

i. EPA Methods 1-4 and 7E for NO_X emissions measured in ppmvd.

ii. EPA Methods 1-4, 7E, and 19 for NO_X emissions measured on a heat input basis.

iii. EPA Methods 1-4 and 10 for CO emissions.

iv. EPA Method 5 or Method 201A for filterable $PM_{10}/PM_{2.5}$, and Method 202, for condensable $PM_{10}/PM_{2.5}$.

v. EPA Reference Method 25A or 24B, South Coast Air Quality Management District Method 25.3, or an equivalent method for VOC, agreed to in advance by Ecology.

e. If the emissions unit to be tested is not operated in a month during which performance testing is due, testing must be conducted no later than the end of the calendar month in which it is next operated unless otherwise authorized by SWCAA or Ecology.

f. Upon written request and adequate justification from the Permittee, Ecology and SWCAA may waive or delay a specific performance test and/or allow for testing to be done at less than maximum operating capacity.

g. For performance test purposes, sampling ports, platforms, and access meeting the requirement of 40 CFR § 60.8(e) shall be provided on the Combustion Turbine/HRSG system and auxiliary boiler exhaust stacks.

h. Permittee shall furnish Ecology and/or SWCAA, as specified in Condition III.A., a written report of the results of performance tests within 60 days of completion of the tests.

2. Cooling Tower TDS Testing

a. The operator shall maintain a log that contains the date and result of each blow-down water quality test, and the resulting mass emission rate. This log shall be maintained on-site for a minimum of five years and shall be provided to authorized representatives of EPA, Ecology, or SWCAA upon request.

b. Permittee shall calculate $PM/PM_{10}/PM_{2.5}$ emission rate using the following calculation method:

$$E = Q \times TDS \times DR$$

Where:

E = average $PM/PM_{10}/PM_{2.5}$ emission rate in lb/hr
Q = average measured water circulation rate, in MMlb/hr
TDS = total dissolved solids measured in cooling water, in ppmw
DR = manufacturer supplied drift rate (0.0005 percent)

c. Thirty (30) days prior to the first blow-down water quality test, the operator shall provide a written test and emissions calculation protocol for Ecology and SWCAA's review and approval.

d. A maintenance procedure shall be established to ensure the integrity of the drift eliminators, that the TDS limits are not exceeded, and compliance with recirculation rates. This procedure is to be kept on-site and available to authorized representatives of EPA, Ecology, or SWCAA upon request. The Permittee shall promptly report any deviations from this procedure.

3. Circuit Breaker Monitoring

a. Permittee shall install and maintain a leak detection system on the circuit breakers that signals an alarm in the facility's control room in the event that any circuit breaker loses more than 10 percent (or an appropriate alternative amount if approved by Ecology and SWCAA) of its dielectric fluid. The owner/operator shall promptly respond to any alarm, investigate the circuit breaker involved, and fix any leak-tightness problems that caused the alarm.

IX. RECORDKEEPING AND REPORTING REQUIREMENTS

A. Prior to start-up, the Permittee shall provide SWCAA with the following details regarding the duct burners:

1. The make, model, and individual heat input capacity of the burners.

2. The number of burners installed.

B. The following records shall be reported to SWCAA for each calendar quarter no later than 30 days following the end of the calendar quarter:

1. The quantity of NO_X, CO, $PM/PM_{10}/PM_{2.5}$, VOCs, and GHG-e emitted by each emission unit for each month of the quarter along with their 12-month rolling totals for each month.

2. The number of hours operated and the quantity of fuel burned by the combustion turbine and duct burners shall be reported for each calendar month of the quarter.

3. All CEMS/DAS data recorded during the quarter as required by this permit shall be reported in an electronic format acceptable to SWCAA.

4. The facility net electrical output (megawatt-hours) as determined in accordance with WAC 173-407-230.

5. The GHG emission rate (lb CO_2e/kW-hr) for the combustion turbine and duct burners.

6. The results of all cooling water sampling for TDS conducted.

7. The amount of water circulated through the cooling towers.

8. The amount of natural gas combusted by the auxiliary boiler.

9. The number of hours the emergency generator engine operated.

10. The number of hours the emergency fire pump engine operated.

11. The results of monthly facility-wide inspections.

12. The pounds of dielectric fluid added to the circuit breakers each month.

C. Air emissions of NO_X, CO, $PM/PM_{10}/PM_{2.5}$, VOC, and GHGs (as CO_2e) shall be reported annually to SWCAA by March 15 for the previous calendar year.

D. Facility net electrical output (megawatt-hours) and emissions of carbon dioxide, methane, and nitrous oxide shall be reported to SWCAA and Ecology no later than January 31 for the previous calendar year in accordance with the requirements of WAC 173-407-230. All supporting information required for the emission calculations shall be included in the report.

E. Records shall be maintained of the occurrence and duration of any start-up, shutdown, or malfunction of the Combustion Turbine/HRSG system or the auxiliary boiler, any malfunction of the Combustion Turbine/HRSG system NO_X

controls, and any period during which the Combustion Turbine/HRSG system NO_X CEM is inoperable.

F. An excess emissions and monitor downtime report must be submitted for the Combustion Turbine/HRSG system in accordance with 40 CFR 60.7(c) and 60.4375 by January 30 and July 30 of each year.

G. Records must be retained for not less than five (5) years after their origination.

1. At a minimum, the most recent two (2) years of data must be retained on-site (or be electronically accessible at the site). The remaining three (3) years of data may be retained off-site.

2. Records must be available for inspection by Ecology and SWCAA within ten (10) days of request.

X. GENERAL RESTRICTIONS ON FACILITY OPERATIONS

A. At all times, the Permittee must, to the extent practicable, maintain and operate the emission units identified in Condition IV.A., including any associated air pollution control equipment, in a manner consistent with good air pollution control practices for minimizing emissions.

B. Determination of whether acceptable operating and maintenance procedures are being used for the emission units identified in Condition IV.A. will be based on information available to Ecology, EPA, SWCAA and/or their authorized representatives, which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source.

C. The combustion turbine emission limits and requirements in Condition V.A. shall not apply during combustion shakedown periods. Shakedown is defined as the period beginning with the initial start-up and ending with successful initial performance testing, during which the Permittee conducts operational and contractual testing and tuning to ensure the safe, efficient, and reliable operation of the plant. The shakedown period shall not exceed 90 days. The requirements of Section X.A. of this permit shall apply at all times.

XI. MALFUNCTION AND EXCESS EMISSIONS REPORTING

A. Prior to incorporation of the conditions of this PSD permit into the Permittee's Title V Air Operating Permit issued pursuant to 40 CFR Part 70, Permittee must report to Ecology and SWCAA, in writing or electronic mail, following the discovery of any malfunction of air pollution control equipment, process

equipment, or of a process, which results in an increase in emissions above the allowable emission limits specified in Conditions V. and VI. of this permit, in accordance with WAC 173-400-107 and the following conditions:

1. As used in WAC 173-400-107(3), "as soon as possible" shall mean in no case later than twelve (12) hours following the discovery of any occurrence of excess emissions above the allowable emission limits specified in Conditions V. and VI. of this permit that represent a potential threat to human health or safety.

2. Permittee must notify Ecology and SWCAA, in writing or electronic mail, postmarked or received within thirty (30) days after the end of the month in which a malfunction is discovered, for any malfunction of air pollution control equipment, process equipment, or of a process, which results in an increase in emissions above the allowable emission limits specified in Conditions V. and VI. of this permit. This notification must include a description of the malfunctioning equipment, process equipment or process, the date and time of the initial malfunction (if known), the period of time over which emissions were increased due to the malfunction, the cause of the malfunction (if known), the estimated resultant emissions in excess of those allowed in Conditions V. and VI., and the methods utilized to mitigate emissions and restore normal operations.

3. For purposes of Condition XII.A., "malfunction" means any failure of air pollution control equipment, process equipment, or of a process to operate in a normal manner.

B. After the conditions of this PSD permit have been incorporated into the Permittee's Title V Air Operating Permit issued pursuant to 40 CFR Part 70, Permittee shall report to SWCAA the discovery of any malfunction of air pollution control equipment, process equipment, or of a process, which results in an increase in emissions above the allowable emission limits specified in Conditions V. and VI. of this permit pursuant to the deviation reporting requirements and, if applicable, pursuant to the unavoidable excess emissions reporting requirements, of that Title V Air Operating Permit.

C. Compliance with the malfunction notification requirements of Conditions XI.A. or XI.B., as applicable, will not excuse or otherwise constitute a defense to any violation of this PSD permit or any law or regulation such malfunction may cause.

XII. RIGHT OF ENTRY

Section 114 of the federal Clean Air Act, 42 U.S.C. § 7414, the Revised Code of Washington (RCW) 70.94.200, and WAC 173-400-105(3) provide authorized representatives of EPA, Ecology, and SWCAA the right to enter and inspect the source.

Refusal by the Permittee to allow such entry and inspection may be a violation of the federal Clean Air Act and/or the RCW subject to penalty as provided in those statutes. Pursuant to these statutes, authorized representatives of EPA, Ecology, and SWCAA, upon the presentation of credentials:

A. Have a right of entry to, upon, or through any premises of the Permittee or any premises in which any records this permit requires the Permittee to maintain are located.

B. Have the right, at reasonable times, to access and copy any records this permit requires the Permittee to maintain.

C. Have the right, at reasonable times, to inspect any monitoring equipment or method required by this permit.

D. Have the right, at reasonable times, to sample any emissions that the Permittee is required to sample under this permit.

XIII. TRANSFER OF OWNERSHIP

A. In the event of any changes in control or ownership of facilities to be constructed, this PSD permit will be binding on all subsequent owners and operators. The applicant must notify the succeeding owner and operator of the existence of this PSD permit and its conditions by letter, a copy of which must be forwarded to Ecology and/or SWCAA, as specified in Condition III.A.

B. If the conditions of this PSD permit have been incorporated into Kalama Energy Center's Title V Air Operating Permit issued pursuant to 40 CFR Part 70, then the provisions for amending that Title V Air Operating Permit to allow for a change in ownership or operational control shall apply in place of the notification provisions in Condition XIII.A.

XIV. ADHERENCE TO APPLICATION AND COMPLIANCE WITH OTHER ENVIRONMENTAL LAWS

A. Pursuant to 40 CFR § 52.21(r)(1), the Permittee must construct and operate the Kalama Energy Center in accordance with this PSD permit and the application on which this permit is based.

B. Pursuant to 40 CFR § 52.21(r)(3), this PSD permit shall not relieve the Permittee of the responsibility to comply fully with applicable provisions of the State Implementation Plan and any other requirements under local, state, or federal law.

C. Any applicant who fails to submit any relevant facts or who has submitted materially incorrect relevant information in a permit application must, upon

becoming aware of such failure, or incorrect submittal, promptly submit such supplementary facts or corrected information.

D. To the extent provided by 40 CFR § 52.12(c), for the purpose of establishing whether or not the Permittee has violated or is in violation of any requirement of this permit, nothing in this permit shall preclude the use, including the exclusive use, of any credible evidence or information relevant to whether the Permittee would have been in compliance with applicable requirements if the appropriate performance or reference test or procedure had been performed.

XV. APPEAL PROCEDURES

This PSD permit, or any conditions contained in it, may be appealed to:

A. The Pollution Control Hearings Board (PCHB) as provided in Chapter 43.21B RCW and Chapter 371-08 WAC; and/or

B. EPA's Environmental Appeals Board (EAB) as provided in 40 CFR § 124.13 and 40 CFR § 124.19.

ACRONYMS AND ABBREVIATIONS

°C	degrees Celsius
BACT	Best Available Control Technology
Btu	British thermal unit
CAA	Clean Air Act
CEMS	Continuous Emission Monitoring System
CFR	Code of Federal Regulations
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalents
EAB	Environmental Appeals Board
Ecology	Washington State Department of Ecology
EPA	United States Environmental Protection Agency
gal	gallon(s)
GHG	greenhouse gas
GHG-e	greenhouse gas equivalent
gpm	gallons per minute
HHV	higher heating value
HRSG	heat recovery steam generator
kJ	kilojoule
kW	kilowatt
kWh	kilowatt-hour
lb	pound(s)
lb/hr	pound(s) per hour
MMBtu/hr	million Btu per hour
MW	megawatt
MWe	megawatt electrical
MWh	megawatt-hour
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards

NOC	Notice of Construction
NO_X	nitrogen oxides
O_2	oxygen
PCHB	Pollution Control Hearings Board
PM	particulate matter
PM_{10}	particulate matter less than 10 micrometers in diameter
$PM_{2.5}$	particulate matter less than 2.5 micrometers in diameter
ppm	parts per million
ppmvd	parts per million by volume dry
PSD	Prevention of Significant Deterioration of Air Quality
RCW	Revised Code of Washington
scfm	standard cubic feet per minute
SCR	selective catalytic reduction
SF_6	sulfur hexafluoride
SWCAA	Southwest Clean Air Agency
TDS	total dissolved solids
tpy	tons per year
ton/day	tons per day
ton/yr	tons per year
TSD	Technical Support Document
ULSD	ultra-low sulfur diesel
U.S.C.	United States Code
VOC	volatile organic compounds
WAC	Washington Administrative Code

APPENDIX A

PERFORMANCE MONITORING REQUIREMENTS
AUXILIARY BOILER

1. Introduction:

   a. The purpose of periodically monitoring the exhaust of the auxiliary boiler is to minimize emissions and provide a reasonable assurance that the unit is operating properly.

   b. Periodic monitoring may be conducted with an electrochemical cell combustion analyzer, analyzers used for reference method testing, or other analyzers pre-approved by Ecology and SWCAA.

2. Monitoring Requirements:

   a. Monitoring to determine emission concentrations of the following constituents shall be conducted for the boiler during each calendar year. The use of an alternative test schedule must be pre-approved by Ecology and SWCAA in writing.

      <u>Constituents to be Measured</u>
      Carbon Monoxide (CO)
      Nitrogen Oxides (NO_X)
      Oxygen (O_2)

   b. Source operation during monitoring must be representative of maximum intended operating conditions during that year.

   c. Alternative monitoring methodologies must be pre-approved by Ecology and SWCAA.

3. Minimum Quality Assurance/Quality Control Measures:

   a. The analyzer(s) response to span gas of a known concentration shall be determined before and after testing. No more than 12 hours may elapse between span gas response checks. The results of the analyzer response check shall not be valid if the difference between the pre-test and post-test response checks exceeds 10 percent of the pre-test response value.

   b. The CO and NO_X span gas concentrations shall be no less than 50 percent and no more than 200 percent of the emission concentration corresponding to the permitted emission limit. A lower concentration span gas may be used if it is more representative of measured concentrations. Ambient air may be used to zero the CO and NO_X cells/analyzer(s) and span the oxygen cell/analyzer.

c. Sampling of the exhaust stack shall consist of at least one test consisting of at least five minutes of data collection following a "ramp-up phase." The ramp-up phase ends when analyzer readings have stabilized (less than 5 percent per minute change in emission concentration). Emission concentrations shall be recorded at least once every 30 seconds during testing. All test data collected following the ramp-up phase(s) shall be reported to EFSEC or their representative. Alternative testing methods may be utilized provided pre-approval is obtained from Ecology and SWCAA.

d. If the test results from any monitoring event indicate that emission concentrations may exceed 12 ppmvd NO_X @ 3 percent O_2 or 50 ppmvd CO @ 3 percent O_2, the Permittee shall either perform 60 minutes of additional monitoring to more accurately quantify CO and NO_X emissions, or initiate corrective action. Additional testing or corrective action shall be initiated as soon as practical, but no later than three days after the potential exceedance is identified. Corrective action includes tuning, maintenance by service personnel, limitation of boiler load, or other action taken to maintain compliance with permitted limits. Monitoring of unit emissions must be conducted within three days following completion of any corrective action to confirm that the corrective action has been effective. Corrective action shall be pursued until observed emission concentrations no longer exceed 12 ppmvd NO_X or 30 ppmvd CO, corrected to 3 percent O_2. Initiation of corrective action does not shield the Permittee from enforcement actions by Ecology.

4. Reporting:

a. All monitoring results shall be recorded at the facility and reported to SWCAA. The following information shall be included in the report:

(1) Time and date of the emissions evaluation.

(2) Identification of the personnel involved.

(3) A summary of results, reported in units consistent with the applicable emission standard(s) or limit(s).

(4) A summary of equipment operating conditions.

(5) A description of the evaluation methods or procedures used including all field data, quality assurance/quality control procedures and documentation.

(6) Analyzer response-check documentation.

b. Performance monitoring test results shall be corrected to 3 percent O_2.

c. Monitoring results shall be reported to SWCAA within 15 calendar days of test completion.