



**Pacific Mountain Energy Center**  
Application for Site Certification Agreement

Submitted to  
**Washington Energy Facility  
Site Evaluation Council**

Application 2006-01

September 12, 2006

# Pacific Mountain Energy Center

---

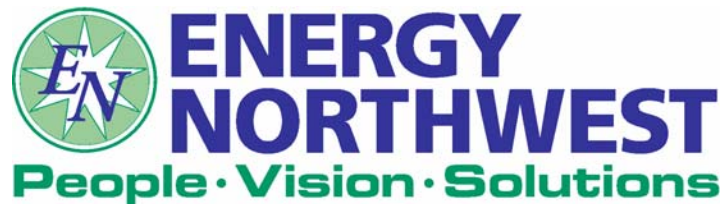
Application for Site Certification Agreement

Submitted to

Washington Energy Facility Site Evaluation Council

Application 2006-01

---



September 12, 2006

September 12, 2006

Mr. Jim Luce, Chair  
Washington Energy Facility Site Evaluation Council  
925 Plum Street SE  
P.O. Box 43172  
Olympia WA 98504-3172

Dear Mr. Luce:

Subject:       **SUBMITTAL OF APPLICATION FOR SITE CERTIFICATION  
PACIFIC MOUNTAIN ENERGY CENTER, KALAMA, WASHINGTON**

Energy Northwest hereby submits its application for Site Certification for construction and operation of the Pacific Mountain Energy Center (PMEC) to the Energy Facility Site Evaluation Council (EFSEC).

The Application being submitted has been prepared in compliance with the regulations found in Section 463-60 of the Washington Administrative Code (WAC). The submittal includes:

- (1)     Sixty-five (65) copies of the Application for Site Certification; and
- (2)     Twenty (20) copies of the Application in electronic format (Adobe .pdf format).

The Application was prepared jointly by Energy Northwest, URS Corporation, and Geomatrix Consultants. Energy Northwest hereby certifies that, to the best of our knowledge, all EFSEC requirements have been reviewed, that the data has been prepared by qualified professional personnel, and the Application is substantially complete.

As stated in the application, Ms. Laura Schinnell and Mr. Thomas Krueger will serve as the point of contacts during the review process. This Application was prepared by a project team composed of staff from Energy Northwest and supporting consultants. As always, our team is prepared to meet with you to discuss the application review process.

Mr. Jim Luce  
September 12, 2006  
Page 2

**SUBMITTAL OF APPLICATION FOR SITE CERTIFICATION  
PACIFIC MOUNTAIN ENERGY CENTER, KALAMA, WASHINGTON**

On behalf of Energy Northwest, I wish to extend our thanks for the assistance of Mr. Allen Fiksdal, Mr. Mike Mills, and Ms. Irina Makarow for their valuable guidance and cooperation during the preparation of this Application.

Respectfully,

A handwritten signature in black ink, appearing to read "J.W. Baker". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

J.W. Baker, Vice President  
Energy/Business Services

## **Documents Submitted For File at EFSEC**

One copy each of the following documents has been submitted to EFSEC and is available for public review at the offices of EFSEC.

### **Cowlitz County**

Cowlitz County Comprehensive Plan (November 6, 1976)

Cowlitz County Code

Chapter 16.10, Gas and Oil Pipelines (March 12, 1971)

Chapter 16.25, Floodplain Management Ordinance (June 22, 1987)

Chapter 16.30, Public and Private Utility Franchise (August 8, 1977)

Chapter 18.10, Land Use Ordinance (January 20, 1998)

Chapter 19.15, Critical Areas Ordinance (February 9, 1998)

Chapter 19.20, Shoreline Master Program (1977)

### **City of Kalama**

City of Kalama Comprehensive Plan (December 7, 2005)

City of Kalama Municipal Code (last updated January 19, 2005)

Title 17, Zoning Regulations

Chapter 14.16, Floodplain Management Ordinance

Chapter 15.02, Critical Areas Protection Ordinance

Chapter 15.08, Shoreline Master Program

Appendix A – Industrial Lease Agreement between the Port of Kalama and Energy Northwest dated October 26, 2005.

Appendix F – Documents Referenced in Section 4.1.3 Releases or Potential Releases to the Environment Affecting Public Health

Appendix F-1 Previous Environmental Site Assessment Reports

Appendix F-2 Site Photographs

Appendix F-3 Agency Database Review, Environmental Data Resources, Inc.

# TABLE OF CONTENTS

## PART 1 GENERAL

SECTION 1.1	DESCRIPTION OF APPLICANT .....	1.1-1
1.1.1.	Applicant.....	1.1-1
1.2.1.	Energy Northwest .....	1.1-1
SECTION 1.2	DESIGNATION OF AGENT.....	1.2-1
SECTION 1.3	ASSURANCES .....	1.3-1
SECTION 1.4	MITIGATION MEASURES .....	1.4-1
1.4.1	Mitigation Measures .....	1.4-1
1.4.2	Fair Treatment.....	1.4-18
SECTION 1.5	SOURCES OF INFORMATION .....	1.5-1
1.5.1	Introduction.....	1.5-1
1.5.2	Site Description.....	1.5-1
1.5.3	Protection From Natural Hazards .....	1.5-1
1.5.4	Earth.....	1.5-2
1.5.5	Air .....	1.5-5
1.5.6	Water.....	1.5-8
1.5.7	Habitat, Vegetaiton, Fish and Wildlife .....	1.5-8
1.5.8	Wetlands .....	1.5-10
1.5.9	Energy and Natural Resources.....	1.5-11
1.5.10	Environmental Health .....	1.5-11
1.5.11	Land Use .....	1.5-12
1.5.12	Transportation.....	1.5-13
1.5.13	Socioeconomic Impact.....	1.5-13

## PART 2 PROPOSAL

SECTION 2.1	SITE DESCRIPTION .....	2.1-1
2.1.1	Location of PMEC .....	2.1-1
2.1.2	Prominent Geogrpahic Features.....	2.1-1
2.1.3	Typical Geological and Climatological Characteristics .....	2.1-5
2.1.4	Land Use Plans and Zoning Ordinances.....	2.1-6
SECTION 2.2	LEGAL DESCRIPTIONS AND OWNERSHIP INTERESTS .....	2.2-1
2.2.1	Introduction.....	2.2-1
2.2.2	Legal Description of Property and Easements.....	2.2-1
2.2.3	Natural Gas Pipeline .....	2.2-4
2.2.4	Proof of Lease .....	2.2-4
SECTION 2.3	CONSTRUCTION ON SITE .....	2.3-1
2.3.1	Pacific Mountain Energy Center Summary .....	2.3-1
2.3.2	Site Arrangement .....	2.3-3
2.3.3	Major Equipment List.....	2.3-3
2.3.4	PMEC Rendering .....	2.3-5

# TABLE OF CONTENTS (Continued)

2.3.5	PMEC Configuration and Performance .....	2.3-5
2.3.6	Gasification Process Description .....	2.3-7
2.3.7	Utility Systems.....	2.3-13
2.3.8	Cathodic and Freeze Protection Systems.....	2.3-15
2.3.9	Combustion Turbine Generators.....	2.3-15
2.3.10	Heat Recovery.....	2.3-15
2.3.11	Steam Turbine Generators .....	2.3-15
2.3.12	Cooling System.....	2.3-15
2.3.13	Water Supply and Discharge Systems .....	2.3-16
2.3.14	Fuel Supply .....	2.3-16
2.3.15	Railroad Spur and Rail Loop .....	2.3-20
2.3.16	Natural Gas System.....	2.3-20
2.3.17	Instrument Air/Service Air Systems .....	2.3-21
2.3.18	Electrical System .....	2.3-21
2.3.19	Capital Costs.....	2.3-23
<b>SECTION 2.4</b>	<b>ENERGY TRANSMISSION SYSTEMS.....</b>	<b>2.4-1</b>
<b>SECTION 2.5</b>	<b>WATER SUPPLY SYSTEM.....</b>	<b>2.5-1</b>
2.5.1	Water Intake and Conveyance Facilities.....	2.5-1
2.5.2	Water Supply and Usage Alternatives .....	2.5-1
2.5.3	Water Rights and Authorizations.....	2.5-3
2.5.4	Potable Water.....	2.5-3
<b>SECTION 2.6</b>	<b>SYSTEM OF HEAT DISSIPATION .....</b>	<b>2.6-1</b>
2.6.1	Introduction.....	2.6-1
2.6.2	System of Heat Dissipation.....	2.6-1
2.6.3	Alternative Forms of Heat Dissipation .....	2.6-2
<b>SECTION 2.7</b>	<b>CHARACTERISTICS OF AQUATIC DISCHARGE SYSTEMS.....</b>	<b>2.7-1</b>
2.7.1	Introduction.....	2.7-1
2.7.2	Discharge Location.....	2.7-5
<b>SECTION 2.8</b>	<b>WASTEWATER TREATMENT .....</b>	<b>2.8-1</b>
2.8.1	Introduction.....	2.8-1
2.8.2	Process Wastewater Sources.....	2.8-1
2.8.3	Evaluation and Selection of Wastewater Treatment Alternatives .....	2.8-3
2.8.4	Waste Discharge/Water Quality Standards.....	2.8-3
<b>SECTION 2.9</b>	<b>SPILLAGE PREVENTION AND CONTROL .....</b>	<b>2.9-1</b>
2.9.1	Purpose and Scope .....	2.9-1
2.9.2	References.....	2.9-1
2.9.3	Definitions.....	2.9-1
2.9.4	Responsibilities.....	2.9-2
2.9.5	Procedure Requirements .....	2.9-2
<b>SECTION 2.10</b>	<b>SURFACE WATER RUNOFF.....</b>	<b>2.10-1</b>
2.10.1	Stormwater Erosion Control During Construction .....	2.10-2
2.10.2	Permanent Stormwater Management.....	2.10-5
2.10.3	Permanent Waterways .....	2.10-8

# TABLE OF CONTENTS (Continued)

SECTION 2.11 EMISSION CONTROL.....	2.11-1
2.11.1 Introduction.....	2.11-1
2.11.2 Criteria Pollutants .....	2.11-2
2.11.3 Toxic Air Pollutants.....	2.11-4
2.11.4 Greenhouse Gas (GHG) Emissions .....	2.11-9
2.11.5 CO2 Emissions From P MEC .....	2.11-10
2.11.6 GHG Offset.....	2.11-10
2.11.7 Types of GHG Offset Projects.....	2.11-11
2.11.8 P MEC GHG Offset Proposal .....	2.11-11
SECTION 2.12 CONSTRUCTION AND OPERATION ACTIVITIES .....	2.12-1
2.12.1 Construction Schedule and Milestones.....	2.12-1
2.12.2 Construction Workforce.....	2.12-1
2.12.3 Operation.....	2.12-8
SECTION 2.13 CONSTRUCTION MANAGEMENT .....	2.13-1
2.13.1 Construction Management Organization .....	2.13-1
2.13.2 Safety Program.....	2.13-1
2.13.3 Training Programs .....	2.13-2
2.13.4 Quality Control Systems and Record Keeping.....	2.13-3
SECTION 2.14 CONSTRUCTION METHODOLOGY .....	2.14-1
2.14.1 P MEC Construction .....	2.14-1
2.14.2 Natural Gas Pipeline Construction.....	2.14-3
2.14.3 Railroad Spurs and Rail Loop Construction .....	2.14-8
SECTION 2.15 PROTECTION FROM NATURAL HAZARDS .....	2.15-1
2.15.1 Introduction.....	2.15-1
2.15.2 Earthquake Hazard.....	2.15-1
2.15.3 Slope Failure and Mass Wasting.....	2.15-3
2.15.4 Volcanic Eruption .....	2.15-3
2.15.5 Flooding .....	2.15-4
SECTION 2.16 SECURITY CONCERNS.....	2.16-1
2.16.1 Security Plan for the Pacific Mountain Energy Center.....	2.16-1
SECTION 2.17 STUDY SCHEDULES .....	2.17-1
2.17.1 Additional Submittals .....	2.17-1
SECTION 2.18 POTENTIAL FOR FUTURE ACTIVITIES AT THE SITE.....	2.18-1
2.18.1 Development of Pacific Mountain Energy Center (P MEC) .....	2.18-1
SECTION 2.19 ANALYSIS OF ALTERNATIVES.....	2.19-1
2.19.1 Introduction.....	2.19-1
2.19.2 P MEC Site Selection Process .....	2.19-1
2.19.3 Gas Transmission Routing Alternatives .....	2.19-3
2.19.4 Cooling System Alternatives .....	2.19-6
2.19.5 Alternative Technologies and Fuel .....	2.19-7
2.19.6 No Action Alternative.....	2.19-8
SECTION 2.20 PERTINENT FEDERAL, STATE AND LOCAL REQUIREMENTS .....	2.20-1



## TABLE OF CONTENTS (Continued)

2.20.1	Table of Applicable Federal, State and Local Permit Requirements .....	2.20-1
2.20.2	Federal Permits .....	2.20-3
2.20.3	State Permits .....	2.20-3
2.20.4	Port of Kalama .....	2.20-9
2.20.5	Local Permits .....	2.20-10
2.20.6	City of Kalama.....	2.20-14

### **PART 3 NATURAL ENVIRONMENT**

SECTION 3.1	EARTH .....	3.1-1
3.1.1	Introduction.....	3.1-1
3.1.2	Geology.....	3.1-1
3.1.3	Seismicity.....	3.1-6
3.1.4	Soils.....	3.1-12
3.1.5	Topography .....	3.1-17
3.1.6	Unique Physical Features.....	3.1-18
3.1.7	Erosion/Enlargement of Land Area (Accretion).....	3.1-18
SECTION 3.2	AIR QUALITY.....	3.2-1
3.2.2	Odor .....	3.2-14
3.2.3	Climate, Visible Plumes, Fogging, Misting, Icing.....	3.2-15
3.2.4	Dust .....	3.2-15
3.2.5	Mitigation.....	3.2-15
SECTION 3.3	WATER .....	3.3-1
3.3.1	Surface Water Resources (Movement/Quality/Quantity).....	3.3-1
3.3.2	Runoff/Absorption .....	3.3-4
3.3.3	Floodplains.....	3.3-5
3.3.4	Groundwater Resources .....	3.3-5
3.3.5	Public water Supplies.....	3.3-6
3.3.6	Proposed PMEC Water Usage .....	3.3-7
3.3.7	Water Supply During Construction .....	3.3-7
3.3.8	Future Conditions .....	3.3-7
3.3.9	Impacts to Public Water Supplies .....	3.3-8
3.3.10	Private Water Supplies.....	3.3-8
SECTION 3.4	HABITAT, VEGETATION, FISH AND WILDLIFE .....	3.4-1
3.4.1	Habitat and Vegetation .....	3.4-1
3.4.2	Fish.....	3.4-8
3.4.3	Wildlife .....	3.4-23
SECTION 3.5	WETLANDS.....	3.5-1
3.5.1	Existing Conditions.....	3.5-1
3.5.2	Impacts.....	3.5-2
3.5.3	Mitigation Measures .....	3.5-3

# TABLE OF CONTENTS (Continued)

SECTION 3.6	ENERGY AND NATURAL RESOURCES .....	3.6-1
3.6.1	Introduction.....	3.6-1
3.6.2	Energy Required .....	3.6-1
3.6.3	Source and Availability of Energy and Natural Resources .....	3.6-2
3.6.4	Nonrenewable Resources.....	3.6-3
3.6.5	Conservation and Renewable Resources .....	3.6-3
3.6.6	Scenic Resources .....	3.6-4

## **PART 4 BUILT ENVIRONMENT**

SECTION 4.1	ENVIRONMENTAL HEALTH.....	4.1-1
4.1.1	Noise .....	4.1-1
4.1.2	Risk of Fire Or Explosion.....	4.1-17
4.1.3	Releases or Potential Releases to the Environment Affecting Public Health.....	4.1-22
4.1.4	Safety Standards Compliance .....	4.1-37
4.1.5	Radiation Levels .....	4.1-38
4.1.6	Emergency Plans.....	4.1-38
SECTION 4.2	LAND AND SHORELINE USE .....	4.2-1
4.2.1	Land Use .....	4.2-1
4.2.2	Light and Glare .....	4.2-10
4.2.3	Aesthetics.....	4.2-11
4.2.5	Historic and Cultural Preservation.....	4.2-26
4.2.6	Agricultural Crops/Animals.....	4.2-37
SECTION 4.3	TRANSPORTATION.....	4.3-1
4.3.1	Existing Conditions.....	4.3-1
4.3.2	Impacts.....	4.3-4
4.3.3	Mitigation Measures .....	4.3-8
SECTION 4.4	SOCIOECONOMIC IMPACT .....	4.4-1
4.4.1.	Existing Conditions.....	4.4-1
4.4.2.	Impacts.....	4.4-14
4.4.3.	Mitigation.....	4.4-24

## **PART 5 APPLICATIONS FOR PERMITS AND AUTHORIZATIONS**

SECTION 5.1	AIR EMISSIONS PERMITS AND AUTHORIZATIONS .....	5.1-1
5.1.1	Introduction.....	5.1-1
5.1.2	Emissions .....	5.1-2
5.1.3	Local Air Quality Impact Assessment .....	5.1-32
5.1.4	Regional air Quality Impact Assessment.....	5.1-49
SECTION 5.2	WASTEWATER AND STORMWATER DISCHARGE PERMIT APPLICATION .....	5.2-1
5.2.1	Wastewater Discharge .....	5.2-1
5.2.2	Stormwater Discharge.....	5.2-1

## List of Tables

1.4-1	Race and Sex Composition in the PMEC Vicinity, 2004
1.4-2	Population living Under the Poverty Level, 2000
2.6-1	Comparison of Alternative Forms of Heat Dissipation
2.8-1	Major Wastewater Sources, Water Cooled System
2.9-1	Oils, Fuels and Hazardous Materials Stored at PMEC
2.11 -1	Permitted Emission Rates for IGCC Units
2.11-2	Proposed BACT Controls and Anticipated Emissions
2.11-3	Estimated Annual Criteria Pollutant Emissions
2.11-4	Estimated Toxic Air Pollutant Emissions from Combustion Turbines
2.12-1	Estimated Quarterly Construction Personnel
2.12-2	Operation Staff Breakdown
2.14-1	Cover Standards for Buried Pipelines
2.19-1	Initial Site Screening
2.19-2	Second Tier Site Screening
2.19-3	Comparison of Alternative Forms of Heat Dissipation
2.20-1	Applicable Federal, State and Local Requirements
3.1-1	Largest Known Earthquakes Felt in Washington
3.2-1	Ambient Air Quality Standards and PSD Increments
3.2-2	Summary of Air Quality Data (2004 and 2005)
3.2-4	Historical Relative Humidity, Precipitation, and Fogging
3.2- 5	Comparison of Model Predictions with Class Ii Increments and SILS
3.2-6	Comparison of Model Predictions with Class I Increments and SILS
3.2-7	Comparison of Cumulative Concentrations with Ambient Air Quality Standards
3.2-8	Maximum Predicted Short-Term (24-hr) TAP Concentrations
3.2-9	Maximum Predicted Annual TAP Concentrations
3.4-1	Plant Species Observed on PMEC Site or Along Railroad Spur and Pipeline Alignments
3.4-2	Threatened and Endangered Fish Species Potentially Present Within Each PMEC Component
3.4-3	Relatively Common Wildlife Species That May Be Found in or Near the PMEC Vicinity
3.6-1	Estimated Plant Energy Consumption
4.1-1	Common Sound Levels/Sources and Subjective Human Responses
4.1- 2	Washington Maximum Permissible Sound Levels (dBA)
4.1- 3	New Industrial and Commercial Noise Source Standards (dBA)
4.1- 4	Range of Measured Hourly Sound Levels (dBA)
4.1- 5	Typical Construction Equipment Noise
4.1- 6	Summary of PMEC Noise Sources
4.1- 7	Project and Cumulative Sound Levels
4.1- 8	Calculated Sound Levels
4.1- 9	Estimated Low Frequency Sound Levels at Residential Receivers
4.1-10	Historic Findings

4.1-11	Agency Database Review
4.2-1	Estimated Heights of P MEC Components
4.2-2	Summary of Visual Impacts from Representative Viewpoints
4.2-3	Public Park and Recreation Facilities Nearby the P MEC and Natural Gas Pipeline Alignment
4.3-1	Existing Traffic Volumes, 2000
4.3-2	TRB Rating System: Level of Service and Delay for Unsignalized Intersections
4.3-3	Estimate Future Traffic Volumes without P MEC, 2012
4.3-4	Estimated Future Traffic Volumes with P MEC, 2012
4.3-5	Level Of Service Summary
4.4-1	Population Distribution in the P MEC Vicinity
4.4-2	Population Age Distribution in the P MEC Vicinity, 2005
4.4-3	Race and Sex Composition in the P MEC Vicinity, 2004
4.4-4	Population Living Under the Poverty Level, 2000
4.4-5	Population Growth Trends and Projections for the P MEC Vicinity
4.4-6	Housing Characteristics in the P MEC Vicinity, 1990, 2000
4.4-7	Housing Values, 2000
4.4-8	Temporary Lodging Units
4.4-9	Employment and Income Data for Cowlitz County, 2004
4.4-10	Major Employers in Cowlitz County
4.4-11	Fire Departments in the P MEC Vicinity
4.4-12	Police Department Staffing Levels in the P MEC Vicinity
4.4-13	Ambulance Service Providers in the P MEC Vicinity
4.4-14	Estimated Quarterly Construction Personnel
4.4-15	Average Power Plant Construction Workforce Composition, By Occupation
4.4-16	Economic Impacts of Construction
4.4-17	Operation Staff Breakdown
4.4-18	Economic Impacts of Operation
5.1-1	Summary of New Source performance Standards
5.1-2	Maximum Annual Emissions from Each Turbine
5.1-3	Short-Term Emissions from Each Turbine
5.1-4	Short-Term and Annual Emissions from the Tank Vent Oxidizer
5.1-5	Short-Term and Annual Emissions from the Auxiliary Boiler
5.1-6	Short-Term and Annual Emissions from the Flare
5.1-7	Short-Term and Annual PM <sub>10</sub> Emissions from the Cooling Towers
5.1-8	Short-Term and Annual Emissions from the Emergency Diesel Equipment
5.1-9	Short-Term and Annual Emissions of Fugitive Dust
5.1-10	Short-Term and Annual VOC Emissions from the Fugitive Equipment Leaks
5.1-11	Short-Term Emissions Summary
5.1-12	Annual Emissions Summary
5.1-13	Summary of TAPs Analyzed for the P MEC
5.1-14	TAP Emissions from both Turbines
5.1-15	TAP Emissions Tank Vent Oxidizer
5.1-16	TAP Emissions from Flare
5.1-17	TAP Emissions from Auxiliary Boiler
5.1-18	TAP Emissions from Emergency Fire Water Pump

5.1-19	TAP Emissions from Emergency Generator
5.1-20	TAP Emissions from the Cooling Towers
5.1-21	TAP Emissions from Fugitive Equipment Leaks
5.1-22	Maximum Annual TAP Emissions from the P MEC
5.1-23	Stack Parameters for Normal Annual Operations
5.1-24	Summary of Air Quality Data (2004 and 2005)
5.1-25	Maximum Predicted Ground Level Concentrations from Normal Operations of the Project– With Selexol and SCR Controls (ICT)
5.1-26	Maximum Predicted Ground Level No 2 Concentrations from Normal Operations of the Project – With Diluent Injection Nox Control (BACT)
5.1-27	Maximum Predicted Short-Term TAP Concentrations
5.1-28	Maximum Predicted Annual TAP Concentrations
5.1-29	Comparison with Applicable Ambient Air Quality Standards for Normal Operations
5.1-30	Comparison with Applicable Ambient Air Quality Standards for Worst-Case Short-Term Startup or Upset Conditions
5.1-31	Class I Area Distances from Proposed Project Site
5.1-32	Speciated 24-Hour Emission Rates for AQRV Analysis
5.1-33	Speciated Annual Emission Rates for AQRV Analysis
5.1-34	CALPUFF Release Parameters for AQRV Analysis
5.1-35	Non Default Calmet Options
5.1-36	Existing Background Deposition in Class I Areas and CRGNSA
5.1-37	Background Aerosol Concentrations for the CRGNSA
5.1-38	Predicted Class I Area and CRGNSA Criteria Pollutant Concentrations
5.1-39	Predicted Class I Area and CRGNSA Deposition Fluxes
5.1-40	Ten Days with Maximum Predicted Class I Area and CRGNSA Extinction Change
5.1-41	Maximum Predicted Extinction Change by Class I Area and CRGNSA

## List of Figures

2.1-1	General Vicinity
2.1-2	Site Vicinity
2.1-3	Existing Site Conditions
2.2-1	Surveyed Drawing of Site
2.3-1	Plot Plan
2.3-2	PMEC Computer Simulation
2.3-3	Feedstock
2.3-4	Proposed Rail Location
2.5-1	Location of Port's Well
2.7-1	Conceptual Drainage Plan
2.7-2	Existing Discharges
2.7-3	Sanitary and Process Wastewater Discharge
2.12-1	Project Milestones
2.15-1	Annual Probability of More than 10 cm of Volcanic Ash
3.1-1	Geology
3.1-2	Site Plan & Geologic Cross Section
3.1-3	Geologic Cross Sections
3.1-4	Tectonic Setting
3.1-5	Cross Sections of Earthquake Hypocenters
3.1-6	Epicenters and Dates of Larger Earthquakes
3.1-7	Quaternary Faults
3.1-8	Soils Map
3.2-1	Wind Rose
3.4-1	Habitat Types
4.1-1	SLM and Receptor Locations
4.1-2	Site Plan
4.2-1	City of Kalama Zoning
4.2-2	Viewpoints
4.2-3	Viewpoint 1
4.2-4	Viewpoint 2
4.2-5	Viewpoint 3
4.2-6	Viewpoint 4
4.2-7	Viewpoint 5
4.2-8	Recreation Areas
4.2-9	Portion of USGS Series
4.2-10	Portion of USGS Series
4.2-11	Overview of site facing SW
4.2-12	Overview of site facing S
4.2-13	Kalama River crossing
5.1-1	Major Structures
5.1-2	Wind Rose
5.1-3	Vicinity of Project Site

5.1-4	Receptor Grids
5.1-5	Receptor Grids
5.1-6	Receptor Grids
5.1-7	CALPUFF Domain UW MM5
5.1-8	CALPUFF Domain, 4 KM
5.1-9	Ozone Monitoring Stations
5.1-10	Surface Meteorological Sites
5.1-11	CalMet Predicted Versus Observed Winds
5.1-12	Max 24 hr PM 10
5.1-13	Max 24 hr SO2
5.1-14	Max 24 hr NOX
5.1-15	Max Annual Sulfur Dep
5.1-16	Max Annual Nitrogen Dep
5.1-17	Max 24-hr Extinction
5.1-18	Change to 24 Hr Extinction
5.2-1	Water Balance

## **List of Appendices**

Appendix A	Industrial Lease Agreement Between Port of Kalama and Energy Northwest (copy on file with EFSEC)
Appendix B	Air Quality B-1 BACT Analysis B-2 Cooling Tower Analysis B-3 Emission Calculations
Appendix C	Wetlands Report
Appendix D	Noise Measurements
Appendix E	Representative Health and Safety Codes
Appendix F	Phase I Environmental Site Assessment (F-1 Previous ESA Report, F-2 Site Photographs, F-3 Agency Database Review) (copy on file with EFSEC)
Appendix G	Tribal Consultation

## List of Acronyms

### A

AC	Alternative Connect
ACFM	Actual Cubic Feet per Minute
AGR	Acid Gas Removal System
AGS	Acid Gas System
AF/YR	Acre Feet Per Year
ALS	Advanced Life Support
AQRV	Air Quality Related Values
ARM	Ambient Ratio Method
ASIL	Acceptable Source Impact Level
ASTM	American Standards Testing and Materials
ASU	Air Separation Unit

### B

BACT	Best Available Control Technology
BART	Best Available Retrofit Technology
BCC	Bioaccumulative Chemical of Concern
BENMAP	Benefits Mapping and Analysis Program
BGS	Below Ground Surface
BMP	Best Management Practice
BNSF	Burlington Northern/Santa Fe
BOD	Biological Oxygen Demand
BPA	Bonneville Power Administration
BTU	British Thermal Unit

### C

CAA	Clean Air Act
CAO	Critical Areas Ordinance
CAPCOA	California Air Pollution Control Officers Association
CASAC	Clean Air Scientific Advisory Committee
CCC	Cowlitz County Code
CCPI	Clean Coal Power Initiative
CCSD	Cowlitz County Sheriff's Department
CD	Criteria Determinant
CCD5	Cowlitz County Fire District No. 5
CEMS	Continuous Emissions Monitoring
CE LLC	Cliffs Eris Limited Liability Company
CFB	Circulating Fluidized Bed
CFC	Chlorofluorocarbons
CFHMP	Comprehensive Flood Hazard Management Plan
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
CH4	Methane



CM	Crustal Mass
CN	Canadian National Railway
CO	Carbon Monoxide
CO <sub>2</sub>	Carbon Dioxide
COD	Chemical Oxygen Demand
COE	Cost of Electricity
Co-Op	Electric Cooperative Utilities
COMS	Continuous Opacity Monitoring System
COS	Carbonyl Sulfide
CRGNSA	Columbia River Gorge National Scenic Area
CSFB	Credit Suisse First Boston
CSGP	Construction Stormwater General Permit
CSZ	Cascadia Subduction Zone
CTED	Community Trade and Economic Development, Washington State
CTG	Combustion Turbine Generator

## **D**

DAT	Depositional Analysis Threshold
DC	Direct Connect
DCS	Distributed Control System
DGER	Division of Geology and Earth Resources, Washington State
DLN	Dry Lox-NO <sub>x</sub>
DO	Dissolved Oxygen
DPS	Distinct Population Segments

## **E**

EFH	Essential Fish Habitat
EFSEC	Energy Facility Site Evaluation Council
EGU	Electrical Generating Units
EIS	Environmental Impact Statement
EIV	Environmental Information Volume
ENR	Engineering News Record
EPC	Engineering procurement and Construction
EPRI	Electric Power Research Institute
ESA	Endangered Species Act
ESP	Electrostatic Precipitator
ESU	Evolutionary Significant Unit
EUR	European Currency (Euro)

## **F**

FLAG	Federal Land Managers Air Quality Related Values Workgroup
FEED	Front End Engineering Design
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FGD	Fluid Gas Desulfurization
FIRM	Flood Insurance Rate Maps

FLM	Federal Land Manager
FSQ	Full Slurry Quench
FT-MSL	Feet Above Mean Sea Level
<b>G</b>	
GE	General Electric Company
GCP	Good Combustion Practice
GEP	Good Engineering Practice
GHG	Greenhouse Gas
GI	Generator Interconnection
GMA	Grown Management Act
GO	Generator Outlet
GPD	Gallons per Day
GPM	Gallons per Minute
GW	Gigawatt
GWJ	Groundwater under the influence of surface water
<b>H</b>	
H	Hydrogen
HAP	Hazardous Air Pollutant
H <sub>2</sub> S	Hydrogen Sulfide
HDD	Horizontal Directional Drilling
HHV	High Heating Value
HG	Mercury
HP	High Pressure
hP	Horse Power
HRSG	Heat Recovery Steam Generator
HV	High Voltage
HVAC	High Voltage Alternative Current
HVDC	High voltage Direct Current
HVTL	High Voltage Transmission Line
<b>I</b>	
I-5	Interstate 5
ICF	ICF Consulting, LLC
ICT	Innovative Control Technology
IGCC	Integrated Gasification Combined Cycle
IOU	Investor Owned Utilities
IP	Intermediate Pressure
IPP	Independent Power Producers
IRP	Integrated Resource Plan
IRR	Iron Range Resources
ISBL	Inside the Boundary Limit
ISGP	Industrial Stormwater General Permit
ISO	International Organization for Standardization
ISPM	Industrial Safety Program Manual

IWAQM	Interagency Workgroup on Air Quality Modeling
<b>K</b>	
KFO	Kennewick Fertilizer Operations
KMC	City of Kalama Municipal Code
KPD	Kalama Police Department
KV	Kilovolt
KW	Kilowatt
KWH	Kilowatt-Hour
<b>L</b>	
LAER	Lowest Achievable Emission Rate
LDP	Laramore, Douglass and Popham Consulting Engineers
LEPGP	Large Electric Power Generating Plant
LGIA	Large Generator Interconnect Agreement
LGIP	Large Generator Interconnection Procedure
LGTI	Louisiana Gasification Technology, Inc.
LNB	Low-NOx Burners
LNG	Liquified Natural Gas
LP	Low Pressure
LSTK	Lump Sum Turnkey
<b>M</b>	
MIN	Mid-American Interconnected Network
MAPP	Midcontinent Area Power Pool
MAPPCOR	Mapp Services
MDEA	Methyldiethanolamine (Amine Absorbent)
MISO	Midwest Independent (Transmission) System Operator
MMBTU	Million British Thermal Units
MSDS	Material Safety Data Sheet
MSL	Mean Sea Level
MTCA	Model Toxics Control Act
MTEP	Miso Transmission Expansion Planning
MW	Megawatt
MWh	Megawatt Hour
MWLAP	Waste Land and Air Protection, British Columbia Ministry of
<b>N</b>	
NAAQS	National Ambient Air Quality Standard
NCEA	National Center for Environmental Assessment
NEPA	National Environmental Policy Act
NETL	National Energy Technology Laboratory
NGCC	Natural Gas-Fired Combined Cycle
NH3	Ammonia
NLCD	National Land Cover Dataset
NOAA	National Oceanic and Atmospheric Administration

NOI	Notice of Intent
NOX	Oxides of Nitrogen
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	National Resources Conservation Service
NRIS	Network Resource Interconnection Service
NSR	New Source Review
NSPS	New Source Performance Standards
NTP	Notice to Proceed
NWPCC	Northwest Power and Conservation Council
NWS	National Weather Service
<b>O</b>	
OAAQS	Oregon Ambient Air Quality Standard
OAQPS	Office of Air Quality Planning and Standards, USEPA
OC	Organic Carbon
OFA	Overfire Air
O&M	Operations and Maintenance
OMB	U.S. Office of Management and Budget
OSBL	Outside the Battery Limits
<b>P</b>	
PAH	Polycyclic Aromatic Hydrocarbons
PC	Pulverized Coal
PDP	Process Design Package
PEP	Project Execution Plan
PFC	Perfluorocarbons
PM	Particulate Matter
PM10	Particulate Matter of 10 microns in diameter or less
PM2.5	Particulate Matter of 2.5 microns in diameter or less
PMEC	Pacific Mountain Energy Center
PMEG, LLC	Pacific Mountain Energy Group, Limited Liability Corporation
PNUCC	Pacific Northwest Utilities Conference Committee
POI	Point of Interconnection
POTW	Publicly Owned Treatment Works
PPA	Power Purchase Agreement
PPB	Parts per Billion
PPM	Parts per Million
PPE	Personal Protective Equipment
PPMVD	Parts per million (dry basis)
PPMW	Parts per million by weight
PPSA	Power Plant Siting Act
PRB	Powder River Basin
PSD	Prevention of Significant Deterioration
PSIA	Pounds per square inch absolute
PSI	Public Service of Indiana

PSIG Pounds per square inch gauge  
PU Public Utility  
PUD Public Utility District

**Q**  
QPD Qualified Public Developer  
QA Quality Assurance  
QC Quality Control

**R**  
RACT Reasonably Achievable Control Technology  
RBLC RACT/BACT/LAER Clearinghouse  
RCW Revised Code of Washington  
RECB Regional Expansion Criteria and Benefits  
REMSAD Regional Modeling System for Aerosols and Deposition  
RM River Mile  
RFP Request for Proposal  
ROW Right-of-Way

**S**  
SACTI Seasonal Cooling Tower Impact  
SBUH Santa Barbara Urban Hydrograph  
SCAQMD South Cost Air Quality Management District  
SCR Selective Catalytic Reduction  
SCPC Supercritical Pulverized Coal Plant  
SEPA State Environmental Policy Act  
SF6 Sulfur Hexafluoride  
SIS System Impact Study  
SNCR Selective Non-Catalytic Reduction  
SNG Substitute Natural Gas  
SO2 Sulfur Dioxide  
SPCC Spill Prevention Control and Countermeasure  
SQER Small Quantity Emission Rate  
SRU Sulfur Recovery Unit  
STG Steam Turbine Generator  
SWMMWW Stormwater Management Manual for Western Washington, Washington  
Department of Ecology  
SYNGAS Synthesis Gas

**T**  
TAP Toxic Air Pollutant  
TCEQ Texas Commission on Environmental Quality  
TDS Total Dissolved Solids  
TER Triangle Economic Research, L.L.C  
TNRCC Texas Natural Resources Conservation Committee  
TOC Total Organic Carbon

TPD	Tons Per Day
TSS	Total Suspended Solids
TTRA	Taconite Tax Relief Area
<b>U</b>	
UFC	Uniform Fire Code
UP	Union Pacific Railroad
USACE	United States Army Corps of Engineers
USDOE	United States Department of Energy
USDOT	United States Department of Transportation
USEPA	United State Environmental Protection Agency
UPS	Uninterrupted Power System
USGS	United States Geological Service
USC	United States Code
USLE	Universal Soil Loss Equation
UTM	Universal Transverse Mercator
UW	University of Washington
<b>V</b>	
VOC	Volatile Organic Compounds
<b>W</b>	
WAAQS	Washington Ambient Air Quality Standards
WAC	Washington Administrative Code
WBS	Work Breakdown Structure
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington Department of Natural Resources
WOFM	Washington Office of Financial Management
WSDOT	Washington Department of Transportation
WSP	Washington State Patrol
WSU	Washington State University
WT	Weight
WUTC	Washington Utilities and Transportation Commission
<b>Z</b>	
ZLD	Zero Liquid Discharge