BEFORE THE STATE OF WASHINGTON

ENERGY FACILITY SITE EVAUATION COUNCIL

In the Matter of Application No. 2003-01: SAGEBRUSH POWER PARTNERS, LLC; KITTITAS VALLEY WIND POWER PROJECT	EXHIBIT 23 (MP-T)

APPLICANT'S PREFILED DIRECT TESTIMONY
WITNESS #4 : MICHAEL PAPPALARDO

Q Please state your name and business address.

A My name is Michael Pappalardo and my business address is 2300 NW Walnut Blvd, Corvallis OR 97330-3538.

Q What is your present occupation, profession; and what are your duties and responsibilities?

A I am employed by CH2M Hill. CH2M Hill provides environmental consulting services to organizations such Zilkha Renewable Energy. We assist those organizations in analyzing environmental impacts of projects such as the Kittitas Valley Wind Power Project. I am an

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Environmental Planner and a Geologist for CH2M Hill. My duties regarding this were to assist in the preparation of the Application for Site Certification for this Project.

Q Would you please identify what has been marked for identification as Exhibit 23-1 (MP-1).

A Exhibit 23-1 (MP-1) is a résumé of my educational background and employment experience.

Q Are you sponsoring any portions of the "Application for Site Certification" and "Clarification Information Provided to EFSEC Independent Consultant for EIS Preparation", for the Kittitas Valley Wind Power Project?

A Yes. I am sponsoring the following sections for which I was primarily responsible for the analysis and development:

Section 1.4.1.1 Storm Water Pollution Prevention Plan (Construction)
Section 1.4.1.3Dust Control
Section 1.4.2.1Storm Water Pollution Control Plan (Operation)
Section 2.1.2 Prominent Geographic Features
Section 2.1.3 Typical Geological Features
Section 2.10 Surface Water Runoff
Clarification Information Section 2.10.5 Underground Cable Trenching Storm Water Pollution Control Measures
Clarification Information Section 2.10.7 Substation Construction Storm Water Pollution Prevention Measures
Section 2.15 Protection from Natural Hazards

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Section 3.1 Earth

Section 3.3.1 Water-Introduction

Section 3.3.2 Surface Water

Section 3.3.3 Runoff and Absorption

Section 3.3.4 Floods

Section 3.3.5 Groundwater

Q What exhibits that are part of the Application that you are sponsoring?

A I am sponsoring Exhibit 13, "Department of Ecology Well Logs for the Project Area" to the Application.

Q Are you familiar with these sections of the Application and Exhibits?

A Yes

Q Did you prepare these sections and exhibits, or, if not, did you direct and/or supervise its preparation?

A I prepared all of these sections and exhibits.

Q Is the information in these sections and exhibits within your area of authority and /or expertise?

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A Yes

Q Are the contents of these sections and exhibits of the Application either based upon your own knowledge, or upon evidence, such as studies and reports as a reasonably prudent persons in your field and expertise are accustomed to rely in the conduct of their affairs?

A Yes.

Q To the best of your knowledge, are the contents of these sections and exhibits of the Application true?

A Yes.

Q Do you incorporate the facts and content of these sections and exhibits as part of your testimony?

A Yes.

Q Are you able to answer questions under cross examination regarding these sections and exhibits?

A Yes

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Q Do you sponsor the admission into evidence of these sections and exhibits of the Application?

A Yes

Q Are there any modifications or corrections to be made to those portions of the Application that you are sponsoring?

A No

Q. Would you please summarize and briefly describe the prominent geographic and typical geological features of the site.

A Geography.

The proposed Kittitas Valley Wind Power Project is located in the Kittitas Valley in south-central Washington. Kittitas County is located east of the Cascade Range in the geographical center of the state. It is bounded to the north by Chelan County, to the south by Yakima County, to the west by King County and to the east by Grant County. Prominent geographic features in around the project site include the Yakima River to the south of the Project, the Wenatchee Mountains to the north, Lookout Mountain to the west, the Cascade Mountains to the far west, and the Kittitas Valley and Columbia River to the east. The Kittitas Valley Wind Power Project is located east and north of the Yakima River, to the west of Green Canyon.

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The Project will be built on the ridges that slope south from Table Mountain, which is part of the Wenatchee Mountains. The immediate Project area is dominated by north-south oriented ridges that slope down from about 3,100 feet in elevation to about 2,200 feet in elevation above the Yakima River towards the south. These ridges are generally dry and wind blown and thus do not support forest cover. Although these ridges slope gently southward along their spines, their transverse slopes are steep. The Project area extends across a 3.5- by 5 mile portion of land that consists primarily of long north-south trending ridges. Between the ridges are ephemeral and perennial creeks that flow into the Yakima River, which is located just south of the Project area. Slopes within the Project area generally range from 5 degrees to 20 degrees, but can reach 40 degrees or more in some of the stream canyons.

Geology.

The Project area is located on the Columbia Plateau, a broad expanse of land located at the eastern base of the Cascade Range, and at the western edge of the Columbia Intermontane Physiographic Province (Freeman and others, 1945). The Columbia Plateau is underlain by a series of layered basalt flows collectively known as the Columbia River Basalt Group. Individual basalt flows range in thickness from a few millimeters to as much as 300 feet. A variety of sedimentary materials (overburden) are intermixed and overlie the Columbia River Basalt Group. Sedimentary rocks are generally thought to underlie the basalts in the Project area (USGS, 2000). The bedrock underlying the Project site consists of interbedded Miocene Grand Ronde Basalt flows and weakly

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lithified volcaniclastic siltstone and sandstone of the Ellensburg Formation. Pliocene to Holocene alluvium, glacial, flood, and mass-wastage deposits constitute the surface materials or overburden that directly overlies the bedrock. This Grand Ronde basalt is the most abundant and widespread formation of the Columbia River Basalt Group.

A single fault is mapped in the Project area, trending east-west near the southern intersection of Highway 97 and Bettas Road. This fault is a high-angle fault with its north side downthrown, and crosses Highway 97 approximately 2,493 feet north of Bettas Road. Running east, the fault is inferred in a location that intersects the H, I, and J turbine strings. The fault location underlies the southernmost turbine in turbine string H (H23). It passes beneath turbine I19 on the I turbine string, and approximately between turbines J10 and J11 on the J turbine string. The fault is estimated to have last been active during the Miocene epoch (between 23.8 and 5.3 million years ago). The total length of the fault is approximately 2.5 miles.

While it is possible that there may have been displacement on some inferred faults between 700,000 and 140,000 years B.P., the geologic deposits present on the ground surface of the Kittitas Valley do not allow this to be determined. Reidel and others (1994) indicate that the most recent movement on faults in Kittitas Valley may have been during the Pleistocene (between 11,000 and 1.8 million years B.P.). However, they reference the work of Waitt (1979) and do not present any new data to support Landau's inference that displacement could be as recent as 10,000 to 13,000 years ago (Molinari, 1999).

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Mineral resources in the immediate vicinity of the Project site include active and inactive commercial and private rock quarries. In addition, the area is a known resource for a rare type of agate known as the "Ellensburg Blue," which is classified by some gemologists as a precious gem. It is possible that the Ellensburg Blue agate could be found on public lands (Washington Department of Natural Resources [DNR] parcels) where Project facilities would be located. However, most of the areas where the Project would coexist with potential deposits of the Ellensburg Blue agate are on privately owned land, or DNR land which has no public access and therefore is closed to the public except by special permission of the adjacent landowner(s).

No significant cumulative impacts and on soil, topography, and geology resulting from construction and operation of the proposed from the Desert Claim, Wildhorse Wind Power Project and the Kittitas Valley Wind Power Project are anticipated. As noted in the Draft Environmental Impact Statement (DEIS) for the proposed Kittitas Valley Wind Power Project, the three project areas are not characterized by high geologic hazards. Impacts on earth resources from development of the three wind power projects would be limited to localized, temporary erosion impacts from ground disturbance during construction. The impacts on near-surface soils would be within the construction footprint for the respective project; they would not geographically overlap each other. Consequently, there would not be an interactive effect among any two of the projects or all three projects (e.g., erosion impacts related to the Desert Claim project would not exacerbate erosion conditions near the KVWPP).

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Q Would you please summarize and briefly describe surface drainage in the area of the Project and the storm water control features that will be utilized.

A In general, the Kittitas Valley Wind Power Project wind turbines, site roads, underground cables, and other supporting infrastructure are located on higher ridge tops with good wind exposure and not in wetlands or watercourses. Most Project facilities will be located on exposed ridge tops away from surface waters. The southern portion Strings A and B, are within approximately one half mile of the Yakima River, and other portions of the Project are located within one half mile Dry Creek (an ephemeral creek), other unnamed ephemeral creeks, the North Branch Canal of the Kittitas Reclamation District, and livestock watering ponds. However, the Project will not generate process water and there will be no point source discharge to any surface waters.

Precipitation could result in surface runoff from Project facilities during Project construction and operation. However, the Project will employ mitigation planning to reduce or eliminate the potential for runoff induced impacts, i.e., erosion and the discharge of sediment and turbidity to surface waters. Mitigation planning will include the development of a grading plan and a Storm Water Pollution Prevention Plan (SWPPP) and Best Management Practices (BMPs) for project construction and operation. The SWPPP will be designed to meet the requirements of the Washington State Department of Ecology General Permit to Discharge Storm water through its storm water pollution control program (Chapter 173-220 WAC) associated with construction activities.

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The Project site grading plan and roadway design will incorporate measures in line with the Project's SWPPP. These measures are intended to ensure that most surface runoff will infiltrate directly into the surface soils surrounding Project facilities. The SWPPP will include both structural and non-structural best management practices (BMPs).

The SWPPP will be prepared along with the Project grading plan by the Project's Engineering, Procurement and Construction (EPC) Contractor when design-level topographic surveying and mapping is prepared for the Project site. The final configuration of proposed improvements will be overlaid onto the detailed topographic maps and the Project civil design engineer will establish the locations and types of construction BMPs to be required of the EPC Contractor. These details will be included on an overall map of the Project site. The SWPPP will also describe the intended installation sequence and function of the selected BMPs, and present the sizing calculations. The plan also will identify the selected minimum standards to which each of the BMPs are to be constructed or installed. Construction practices will emphasize erosion control over sediment control through such nonquantitative activities as:

- Straw mulching and vegetating disturbed surfaces;
- Retaining original vegetation wherever possible;
- Directing surface runoff away from denuded areas;
- Keeping runoff velocities low through minimization of slope steepness and length; and
- Providing and maintaining stabilized construction entrances.

General structural BMPs could include the installation of the following control measures:

- Temporary straw bale and silt fence sediment barriers;

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- Check Structures and Sediment Traps;
- Matting and Erosion Control Blankets; and
- Control of Excavation De-Watering.

Specific structural BMPs for road construction activities could include the following:

- The maintenance of vegetative buffer strips between the impacted areas and any nearby receiving waterways;
- Installation of sediment fence/straw bale barriers on disturbed slopes and other locations shown on the SWPPP;
- Straw mulching at locations adjacent to the road that have been impacted;
- Providing temporary sediment traps and sedimat type mats downstream of seasonal stream crossings;
- Installation of silt fencing on steeper exposed slopes; and
- Planting of designated seed mixes at impacted areas.

Excavated materials from trenches will be piled alongside the cable trenches for back filling after cable installation. Sediment fences, hay bales or matting will be installed on steeper down slopes near the storage piles. After backfilling, excess excavated soils will be spread around the surrounding area and contoured to the natural grade. Cobbles and rocks too large for backfilling used in rock checkdams or to support other on-site erosion control measures or disposed offsite. Finally, the area will be re-seeded with a designated seed mix, as appropriate to the location, in consultation with WDFW.

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Examples of non-structural BMPs include management practices such as implementation of materials handling, disposal requirements and spill prevention methods.

After construction is completed, the area will be returned as closely as possible to its original state. This excludes the access roads, which will remain in place for the life of the project. On-site construction management will monitor the area for erosion and implement additional control measures if necessary.

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Exhibit 23 -1(MP-1)

Michael E. Pappalardo

Environmental Planner/Register Professional Geologist

Education

BS, Geology, University of Oregon

Professional Registrations

Registered Professional Geologist: Oregon (#G1696)

Relevant Experience

Mr. Pappalardo has more than 14 years of experience in environmental planning, permitting water resources, and geologic services. His background includes watershed planning and hydraulic studies; dam decommissioning; surface water intake and National Pollutant Discharge Elimination System (NPDES) outfall and stormwater permitting; anadramous fish passage improvement projects; wind energy facility and transportation project permitting; environmental monitoring and monitoring plans; National Environmental Policy Act (NEPA) compliance and Environmental Impact Statements (EIS); Environmental Assessments (EA), Habitat Conservation Plans (HCPs), Storm Water Pollution Prevention Plans (SWPPP) and Spill Prevention Control and Countermeasures (SPCC) plans. He develops site-specific Sediment and Erosion Control Best Management Practices (BMP). He has also conducted a number of geologic and hydrogeologic investigations, environmental audits, hazardous waste site investigations and remedial actions, and is a large mine permitting specialist.

Representative Projects

NEPA / CEQA Project Management

Task Lead, EPA Point Thomson Environmental Impact Statement (EIS), Alaska. Responsible for delivering the EIS for ExxonMobil's proposed gas cycling facility at Point Thomson on the north slope of Alaska.

NEPA Coordinator, Trinity River Fishery Restoration Final EIS/EIR,U.S. Fish and Wildlife Service.

Principal Project Author, Imperial Irrigation District (IID) Water Conservation and Transfer Project DEIS/EIR, and HCP, California. Assessed impacts to water quality and hydrology in drains and rivers in the 500,000 acre IID area and the Salton Sea resulting from the transfer of 300,000 acre-feet of water to the City of San Diego and Los Angeles Metropolitan Water District. This project is the largest water transfer attempted in the State of California.

Principal Project Author, Geology Sections, Simpson Timber Company Aquatic HCP and DEIS, California. Described geology on 500,000 acres of Simpson forestland in the Klamath and Coast Ranges Geologic Provinces in northwest California. Evaluated proposed changes to Simpson land management practices (timber harvesting and road construction and reclamation) and the predicted impacts these practices would have on geology and soils i.e., mass wasting and sediment discharge to coastal streams and rivers in the region.

Permit Coordinator and Author, TCCA Red Bluff Diversion Dam Decommissioning and Intake Facility Design DEIS/EIR. Hydrology, water quality, hazardous materials, geology and hydrogeology sections for the DEIS/EIR.

Project Author And Permitting Assistant, Clear Creek/Saeltzer Dam Removal Environmental Assessment (EA). Geology, hydrogeology, mineral resources and hazardous materials (mercury contaminated sediment investigation) sections.

EIS Analyst, Canarc Resources New Polaris Gold Mine and Proposed Transportation Corridor and Port Facility, British Columbia and Southeast Alaska. Provided an analysis of the need for an EIS, cost projections for baseline studies, EIS development, and project permitting. Initiated baseline studies with project contractors.

Technical Resources Team Leader And Project Coordinator, EIS, Yarnell Mine Project, Arizona. Preparation of an EIS for the Yarnell Mine Project.

Supplemental EIS and Public Scoping Documents, Echo Bay Mine, A.J. Mine Project, Juneau, Alaska. Wrote sections of the Supplemental EIS and public scoping documents for Echo Bay Mine's A.J. Mine project. Conducted watershed management studies of selected basins in the Juneau/Gastineau Channel area. Developed descriptions for alternative mine tailing disposal option and analyzed net present value costs for each option.

Permitting

Project Coordinator, Preparation of the Oleson Road Constraints Report. Coordinated the development of a constraints report for the widening of a transportation corridor through Multnomah and Washington Counties in the Portland metropolitan area in Oregon.

Task Lead, Westside Interceptor Project, Redding, California. Wrote project environmental monitoring and compliance plan for a sewer line construction project within city transportation corridors in downtown Redding.

Water Resource Planning, BHP Copper Inc., Superior, Pinto Valley, Miami, and Copper Cities Mines, Arizona. Helped BHP to consolidate and reduce its surface water point source discharges and eliminate unnecessary EPA NPDES process discharge permits during mine closure. Conducted an analysis of EPA jurisdiction over surface waters contained in drainage basins located within the patented and unpatented areas of the mines in the immediate area of some of the largest open-pit mining operations in the U.S. Developed SWPPPs and Sediment and Erosion Control BMP plans for the facilities. Helped BHP to be among the first U.S. companies to develop SWPPPs that comply with EPA's Storm Water Muti-Sector General Discharge Permit for the mining industry.

Environmental Consultant, Permit Coordination and Environmental Compliance Management, Echo Bay Mine, A.J. Mine Project, Juneau, Alaska. Filed NPDES and Water Rights applications; developed an EPA-approved NPDES Quality Assurance Project Plan for monitoring mine water discharge; and wrote a comprehensive environmental monitoring manual for predevelopment, operational, and closure phases of the project. Coordinated project monitoring schedules and developed techniques for statistical analysis of environmental data. Designed underground cleanup and BMP plans for implementing corrective action procedures for underground cleanup of a petroleum spill in the mine. Negotiated environmental monitoring criteria with local, state and federal regulatory agencies and assisted in setting up an environmental compliance program for the mine. Developed SWPPP and SPCC plans for the project.

Environmental Consultant, Kensington Venture, Juneau, Alaska. Prepared a comprehensive environmental monitoring manual for the proposed 5,000-ton-per-day Kensington Mine Project located within an environmentally sensitive area, Lynn Canal, in the Tongas National Forest in southeast Alaska. Areas covered in the manual include, groundwater, seawater, freshwater, wildlife, and marine biological monitoring. Wrote an Emergency Action Plan/Facility Response Plan, SPCC Plan, and U.S. Coast Guard Marine Transfer Related (MTR) plan for ship-to-shore transfer of petroleum products to the site. Wrote mine site SWPPP and BMP plans and filed NPDES discharge permit applications for project pre-operational and operational requirements. Negotiated environmental monitoring criteria with state and federal regulatory agencies. Conducted watershed management studies of selected in drainage basins surrounding the mine.

Consulting Hydrogeologist, Hydro-Geo Consultants and Fluor Daniel, Minera Alumbrera Copper Mine Project, Northwest Argentina. Consulting hydrogeologist for the 80,000-ton-per-day, $1.4 billion Minera Alumbrera copper mine project in the Catamarca Province, Northwest Argentina.

Environmental Consultant, Kennecott Greens Creek Mine, Juneau, Alaska. Conducted water balance and hydrogeologic study for the Greens Creek Mine. Designed comprehensive SWPPP plan for the mine and related mill facilities in a format that Kennecott replicated for its other mine facilities throughout the U.S. Assisted in designing reclamation procedures for restoring waste rock piles located at the mine.

Environmental Consultant, Amax Fort Knox Gold, Fairbanks, Alaska. Assisting in development of a water resources report/baseline study for the 32,000-ton-per-day Fort Knox Gold Mine near Fairbanks, Alaska. Conducted overview of current and projected regulatory issues, analyzed existing watershed conditions and available water supply, and supervised water quality modeling efforts. Modeling efforts included low temperature mixing and aqueous geochemistry and dilution modeling of waste, process, mine pit, and surface water.

Exploration Geologist, Cambior U.S.A. Precious metals exploration in Nevada.

Permit Coordinator, Clearlake Oaks County Water District, Lake County California. Developed project description and managed federal, state and local permitting activities (USACE 404, California State Water Resources Control Board 401 Certification, CA Department of Fish and Game Section 1600 Streambed Alteration Permit and ESA consultation, Lake County local grading and building permits and permit exclusion and exemptions).

Project Manager, Indian Valley Watershed Management and Riparian Restoration Project, Plumas County, California. Principal author of the Indian Valley Water Resources Management Plan, technical liaison for Upper Indian Creek Watershed Hydrology Study and Indian Valley Hydraulic Model Report. Member of the Indian Valley Technical Advisory Committee.

Project Manager, Grants Pass Irrigation District Savage Rapids Dam Decommissioning Project.

Project Coordinator, Barrack Ranch Streambed and Riparian Restoration Project, Monterey County, California. Wrote construction SWPPP for the Barrack Ranch Streambed and Riparian Restoration Project in Monterey County.

Permit Coordinator, Murphy Crossing Water Supply Water Intake Facility, Pajaro Valley Water Management Agency in Santa Cruz County, California.

Permit Coordinator, Harkins Slough Intake Facility Construction Project, Pajaro Valley Water Management Agency, Santa Cruz County, California.

Assistant Project Manager, Zilkha Renewable Energy, 121-Turbine Wind Energy Project, Kittitas Valley, Washington. Application to the Washington Energy Facility Siting Evaluation Council for a 121-turbine wind energy project in the Kittitas Valley of central Washington.

Task Manger, Stateline Wind Project Phase II Supplemental EIS, Walla Walla County Washington. Responsible for the management of key task leaders and the development of the SEIS for a 126-turbine expansion of the project. Principal author of the geology and soils sections of the document.

Task Manger, Phase III Amendment Application, Stateline Wind Project, Umatilla County, Oregon. Task manager for the Phase III amendment application to the Oregon Energy Facility Siting Council for a 180-turbine expansion of the Stateline Wind Project in Umatilla County.

Other Relevant Environmental Experience / Employment History

Environmental Technical Advisor, Stoel Rives, Portland, Oregon. Environmental technical advisor to the law firm's 30-plus member Environmental Practice Group. Knowledge and interpretation of local, state and federal environmental codes and statutes on water quality (Clean Water Act), solid and hazardous waste (CERCLA and RCRA), and air permitting. Understanding of chemical release reporting requirements and liability and enforcement issues. Understanding of Endangered Species Act issues and Section 7 and Section 10 consultation and conferencing requirements. Background in legal affairs and legal writing. Legal research coordinator on Lexis Nexis, Westlaw, and Internet databases.

Environmental Consultant, Willamette Valley Company, Oregon. Developed Stormwater Pollution Prevention Plan (SWPPP) and Spill Prevention Control Countermeasure (SPCC) for this wood products chemical manufacturer in Eugene, Oregon. The SWPPP was singled out by the City of Eugene as an example plan for other industrial facilities within City jurisdiction.

Environmental Consultant, Weyerhaeuser, Oregon. Assisted Weyerhaeuser in developing a comprehensive stormwater pollution prevention program for the company's 450-acre wood products and pulp mill facility in Springfield, Oregon.

Environmental Consultant, Alaska Forest Association. Filed NPDES Storm Water Discharge permits for 26 members of the Alaska Forest Association (AFA). Developed SWPPPs for saw mill, pulp and paper mills, and remote logging operations for AFA members throughout Alaska.

Associate Geologist, Brown and Caldwell Consultants. Conducted site investigations for leaking underground storage tanks and solid waste landfill facilities throughout Oregon, Washington, Idaho, and California. Conducted hazardous waste site assessments, environmental audits, and hydrogeologic investigations for wood product manufacturers and pentachlorophenol-contaminated wood product treatment facilities.

U.S. Geological Survey, Clark County, Washington. Participated in Regional Aquifer Survey Assessment (RASA) for groundwater resources underlying the Portland Basin and Clark County. Developed unique statistical approach to facilitate use of a regional deep percolation model for current and future regional aquifer studies.

Professional Affiliations

National Water Well Association/Association of Groundwater Scientists and Engineers
Northwest Mining Association
SME/Short Course Lecturer: Storm Water Management Planning at Mining Projects, SME Convention, Denver, Colorado

Specialized Education and Training

OSHA - 40 Hour Hazardous Material Health and Safety Training