BEFORE THE STATE OF WASHINGTON

ENERGY FACILITY SITE EVAUATION COUNCIL

In the Matter of Application No. 2004-01: WIND RIDGE POWER PARTNERS, LLC; WILD HORSE WIND POWER PROJECT	EXHIBIT 22 (MP-T)

APPLICANT'S PREFILED DIRECT TESTIMONY
WITNESS # 3: 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 project 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 22-1 (MP-1).

A Exhibit 22-1 (MP-1) is a résumé of my educational background and employment experience.

Q Are you sponsoring any portions of the "Application for Site Certification" for the Wild Horse Wind Power Project?

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

Section 1.6.1	Summary of Potential Impacts and Mitigation Measures, Cumulative Impacts, Earth Resources
Section 1.6.3	Summary of Potential Impacts and Mitigation Measures, Cumulative Impacts, Water Resources
Section 3.1	Earth
Section 3.3	Water Resources (except Section 3.3.2.3, 'Water Use During Construction')
Section 3.17.5	Cumulative Impacts, Earth Resources
Section 3.17.7	Cumulative Impacts, Water Resources

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

A I am sponsoring the following exhibits.

Exhibit 5 Soils Map

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Exhibit 6A Geologic Units and Faults

Exhibit 6B Geologic Structures and Fault Map

Exhibit 10 FEMA Flood Zone Map

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?

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 reasonably prudent persons in your field and expertise are accustomed to rely in the conduct of their affairs?

A Yes.

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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

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

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

A Geography.

The proposed Wild Horse Wind Power Project is located in the northeast portion of Kittitas County in central Washington. Prominent geographic features in Kittitas County include the Yakima River and Kittitas Valley to the southwest of the Project, the Wenatchee Mountains to the northwest, the Cascade Mountains to the far west, and the Columbia River to the east. The immediate Project area is dominated by northwest-southeast trending ridges that gently slope between elevations of 3,000 to 3,800 feet, and Whiskey Dick Mountain at approximately 3,873 feet. These ridges are generally dry and wind blown and support short shrub steppe vegetation.

The Project area covers approximately 8,600 acres of land, although the actual permanent footprint of the area occupied by all of the Project facilities is only 165 acres. With the exception of Whiskey Dick Mountain, much of the site is a relatively flat plateau with steep-sided drainages eroded into it. Ephemeral and spring-fed creeks flow primarily eastward from the Project into the Columbia River. Exceptions are Dorse Spring and a spring in the south part of the Project area that flow south and west, draining into the Yakima River. Most of these drainages originate at springs that exist approximately between elevations 3,300 and 3,400 feet above mean sea level. Slopes within the Project area generally range from less than 5 degrees on the flat plateau area and ridge lines, up to 40 degrees on Whiskey Dick Mountain and in side drainages.

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The Project is proposed on the ridges and plateau northeast of Whiskey Dick Mountain. Whiskey Dick Mountain is the most prominent topographic feature in the Project site, and trends west-southeast, whereas the ridges in the northeast portion of the Project trend in various directions. The proposed strings of wind turbines trend generally in a northwest-southeast direction on these ridges. The Project site and adjacent lands range in elevation from approximately 2,000 to 3,870 feet above mean sea level with ridges ranging from 3,000 to 3,873 feet. Basalt rock is at or near the surface in most locations of the Project site, and mantled by a relatively thin cover of overburden clayey and sandy soil.

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 Miocene-age (23.8 to 5.3 million years before present) basalt flows and volcaniclastic siltstone and sandstone. Pliocene to Holocene (5.3 million years ago to present) alluvium, glacial, flood, and mass-wastage deposits constitute the surface materials or overburden that directly overlies the bedrock.

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Two faults are mapped in the southeast area of the Project, that approximately run parallel to and on either side of the Whiskey Dick Anticline (which approximately follows the layout of the G string). Several other faults are noted approximately 5 miles west of the Project, which also trend northwest-southeast. These faults offset Miocene-age formations, and are mapped as being concealed beneath Quaternary formations (Tabor et al., 1982). This indicates the faults in the Project vicinity are older than Quaternary age, and likely formed in late Miocene age (between 6 and 18 million years ago). Based on the low level of historical seismicity and lack of late-Quaternary offsets of local deposits, the faults in the Project vicinity are likely inactive or else active but typically produce events with magnitude less than 3.0. Based on this information, local faults are not considered to pose a significant hazard to the proposed Project and further investigation or other mitigation measures are not warranted.

Mineral resources in the immediate vicinity of the Project site include a small inactive borrow pit near the northwest corner of the site. Impacts to local geologic resources would be limited to rock excavated during wind turbine foundation construction activities and gravel quarrying for construction. Earth materials disturbed during excavation activities are not considered significant geologic resources, and therefore, impacts to local geologic resources would be negligible.

No significant cumulative impacts and on soil, topography, and geology resulting from construction and operation of the proposed from the Desert Claim, Kittitas Valley Wind Power Project and the Wild Horse Wind Power Project are anticipated. As noted in the Draft Environmental Impact Statement (DEIS) for the proposed Wild Horse Wind

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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 all three projects.

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 Wild Horse 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. The Project facilities will be located on exposed ridge tops away from surface waters. The closest of the Project wind turbine strings are located approximately 1/4 mile horizontally away from the several small creeks and their tributaries, springs, stock watering ponds, and other unnamed ephemeral creeks. These include Whiskey Dick, Skookumchuck, and Whiskey Jim creeks; and Wild Horse, Skookumchuck Heights, Dorse, Reynolds, Thorn, Government, Pine, and Seabrock springs. The Project layout has been designed to avoid any impacts to streams and riparian areas. Roads, underground cables, turbine foundations, transmission poles and other associated infrastructure will not be located within any riparian areas or streams. The proposed construction activities for the transmission feeder lines will not involve the use of any heavy equipment in stream beds or riparian areas. The Project will

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not generate process water and there will be no point source discharge to any surface waters.

All excavation and facilities shall be relatively shallow and will not exceed a maximum of 35 feet in depth for the turbine foundations. The roads, tower foundations and other facilities are sufficiently above the water table to avoid any significant impacts to subsurface hydrology and will have no direct effect on groundwater quantity, quality, and flow direction in the immediate area below the proposed facilities. There will be no well installed to service the operation and maintenance facility. Project roads will be designed and surfaced to eliminate impacts to groundwater.

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.

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

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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
- Check Structures and Sediment Traps

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- Matting and Erosion Control Blankets
- 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 that have been impacted which are adjacent to the road;
- Installation of silt fencing on steeper exposed slopes;
- 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 will be 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.

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

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project. On-site construction management will monitor the area for erosion and implement additional control measures if necessary.

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