3.3 WATER RESOURCES

3.3.1 Existing Conditions

3.3.1.1 Surface Water

The Project will not generate process water and there will be no point source discharge to nearby surface waters. However, because the Project is located within one-half mile of nearby surface waters, brief descriptions of these creeks and springs are provided below. Most Project facilities will be located on exposed ridge tops away from surface waters and floodplains, as shown in Exhibit 1-B, 'Project Site Layout'. Several of the Project wind turbine strings are within approximately 1/4 mile horizontally of 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.

Creeks

Whiskey Dick, Skookumchuck, and Whiskey Jim creeks all originate within the proposed Project boundary, at an elevation of approximately 3,400 feet. Whiskey Dick and Skookumchuck Creeks flow east and southeast to an elevation of about 700 feet at their mouth at the Columbia River. Both creeks have a relatively steep gradient, with an average creekbed slope of 200 to 250 feet per mile over the 10 or 12 mile lengths of these creeks. Whiskey Jim Creek has an average gradient of 250 to 300 feet/mile until it joins Parke Creek at the eastern edge of the Kittitas Valley. Each of these creeks collects water from surface runoff, springs, and seeps that exist along each drainage. The creeks transition from intermittent flow in their upper elevations to perennial flow as they pick up flow from runoff, springs and seeps on the descent to lower elevations.

Springs

Wild Horse, Skookumchuck Heights, Dorse, Reynolds, Thorn, Government, Pine, and Seabrock springs are all mapped in the Project area. One additional spring exists just east of turbine C-5 in the south part of the Project and is mapped simply as "spring" on the USGS base mapping. Several of these springs have been developed by ranchers in the area, to the extent that a portion of their flow is collected and contained for the purpose of stock watering. The flow was approximated for several of these springs in May 2003. The observed flow rates were found to be in the range of 1 to 5 gallons per minute. The majority of these springs exist between elevations of 3,300 and 3,400 feet in the Project area. Because of the relatively short distance from the top of the ridges down to the location of the springs, the recharge area is relatively small and it is anticipated that spring flow will decrease later in the summer and fall.

The Project is located on ridge tops and away from nearby surface waters. Because Project facilities will be located significantly outside the floodplain of the Yakima and Columbia Rivers and other water bodies (the Project is located two to three thousand feet above the respective river elevations, see Exhibit 1-A 'Project Area Overview'), the risk of flood impacts is insignificant. Exhibit 10 contains a FEMA Flood Zone Overlay map indicating that the nearest 100-year flood zone occurs in Parke Creek below 2,000 feet in elevation, over two miles downgradient from the nearest Project feature which is the BPA transmission feeder line.

3.3.1.2 Ground Water

Ground Water Resources

In the State of Washington, groundwater quantity is protected by surface water and groundwater rights, and groundwater quality standards are defined in WAC 173-200.

Aquifer Description and Hydraulic Characteristics

As noted in the Section 3.1, 'Earth', the Project is located within the Yakima Fold Belt sub-province of the Columbia Plateau Physiographic Province. The variation in the geology of the overburden, multiple basalt flows, and interbedded sedimentary units provides complexity to the groundwater situation in the region. As a result, numerous hydrologic units exist within the complex geology of the Yakima Fold Belt and the greater Columbia Plateau aquifer system. However, to simplify the description of the area's hydrogeology, and to provide a description of the hydrogeologic conditions within and near the site, the aquifers in the vicinity of the Project have been grouped into two main hydrologic units: the overburden and the basalt aquifers.

Overburden Aquifer

The overburden in the structural basins of the Columbia Plateau Physiographic Province readily transmits water and comprises water table aquifers. These aquifers are generally coarse-grained and highly permeable in their upper sections and fine-grained and less permeable at depth. However, where the overburden is thick, such as in the structural basins in the Yakima Fold Belt, extensive coarse-grained layers exist deeper in the section and function as water-producing zones.

In the Yakima Fold Belt, groundwater movement in the overburden is downward from the anticlinal ridges toward the streams and rivers (i.e., Columbia and Yakima Rivers) in the intervening synclinal basins (USGS, 2000). The water-level contours for the overburden aquifer roughly parallel land surface (Whiteman, 1986; Lane and Whiteman, 1989; Hanson and others, 1994). Recharge is mainly from infiltration of applied irrigation water and from precipitation (USGS, 2000), with precipitation acting as the predominant source of recharge (Bauer and Vaccaro, 1990). Discharge is to rivers, lakes, drains, and waterways and to the underlying basalt unit. Downward movement of water to the underlying basalts is controlled by intervening fine-grained sedimentary layers and by head difference between the units (USGS, 2000).

Basalt Aquifers

Groundwater in the basalts occurs in joints, vesicles, fractures, and in inter-granulated pores of the intercalated sedimentary interbeds. The basalt forms an extremely complex heterogeneous aquifer system with interflow zones that potentially function as small semiconfined to confined aquifers. The basalt transmits water most readily through these interflow zones, which represent about 5 to 10 percent of the total thickness of a typical basalt flow (USGS, 1994). Deeper basalt units are generally confined. However, because the hydraulic connection between units is sufficient to allow continuous vertical movement of water between them, the confined units are referred to as being semiconfined (USGS, 2000).

Water-level data indicate that over most of the plateau, the vertical component of regional flow in basalts is downward except near discharge areas, located generally along streams and rivers (Lane and Whiteman, 1989). Localized anomalies to this pattern are caused primarily by geologic structures of both known and uncertain nature and secondarily by groundwater pumping and irrigation (USGS, 2000). Similar to the overburden aquifer, groundwater movement in the basalt aquifers of the Yakima Fold Belt is from the anticlinal ridges toward the streams and rivers (i.e., Yakima River) in the intervening synclinal basins (USGS, 2000).

Ground Water Quality and Beneficial Use

Groundwater has not yet been exploited for beneficial use via drilled wells within the Project area, according to a search of well logs for the Project area (Washington State Department of Ecology, 2003). The groundwater wells mapped in the area are at least 2 miles from the Project site boundary, and at least 1,000 feet lower in elevation. However, groundwater is vigorously used in the surrounding areas for domestic, irrigation, and other agricultural purposes, especially in the Kittitas Valley to the west. A review of nearby well descriptions in the surrounding vicinity indicates that the area's wells typically penetrate and draw water from the basalt aquifer, at depths of 100 to 500 feet. In the Project area, it is uncertain how deep a well would have to be to develop groundwater from the basalt aquifer of the area.

Groundwater in the basalt aquifer system is generally suitable for most uses. According to a report on the geochemistry of the Columbia Plateau aquifer system (USGS, 1994), the dominant water type is calcium magnesium bicarbonate, and sodium bicarbonate is the next most prevalent water type. However, sodium concentrations increase with residence time and the largest concentrations are found in samples from the deepest wells.

3.3.2 Impacts of the Proposed Action

3.3.2.1 Construction

Surface-water runoff/Absorption

Surface water runoff potential will be greatest during the construction of the Project, when large quantities of soil will be disturbed for construction of roads, tower foundations and other infrastructure.

Precipitation could result in surface runoff from Project facilities during Project construction and operation. However, the Project site grading plan and roadway design will incorporate measures in line with the Storm Water Pollution Prevention Plan (SWPPP) and Best Management Practices (BMPs) to ensure that most surface runoff will infiltrate directly into the surface soils surrounding Project facilities. Potential surface water impacts resulting from runoff related to construction and operations of the Project and measures to control such runoff are described below in 'Construction General Storm Water Pollution Prevention Measures'. The Project will implement a formal SWPPP and BMPs as are also described below in detail in, 'Construction General Storm Water Pollution Prevention Measures', to reduce and/or eliminate the discharge of suspended sediment and turbidity above the turbidity criteria stipulated in the Water Quality Standards for Surface Waters of the State of Washington (WAC 173-201A).

Water used for dust suppression would be directly applied using tanker trucks equipped with rear end sprinkler systems and absorbed on site or evaporated.

In general, surface soils on the Project site consist of silty sandy clay that has slow to moderate permeability. This material is dry to moist, and contains locally clayey zones that retain more moisture. These soils are typically present in the upper 12 inches, although areas were observed on the Project site where clay and fine-grained material was present in the upper 8.5 feet. At most locations on the Project, the thickness of soil overlying rock is minimal, and rock is either very near or outcropping at the surface. The presences of slow to moderate permeability soils at the site results in a moderate to relatively high runoff potential.

The erodibility (or erosiveness) of a particular soil is a function of slope and other physical characteristics such as depth of the soil, clay content, water holding capacity, vegetative cover, etc. The USDA Natural Resource Conservation Service compiles these characteristics into a classification scheme known as an "erosivity index." Generally, the erosivity index is available in NRCS Soil Conservation Surveys that are published for individual counties throughout the U.S. However, the only survey available for Kittitas County was published in 1945 and is currently outdated and out of print. In addition, the erosivity index was not provided in soil surveys that were published at the time that the Kittitas County soil survey was released. Moreover, it should be noted that the erosivity index pertains to in situ (i.e., undisturbed) soils, as opposed to soils disturbed by construction. However, there are other indicators that make it possible to draw conclusions regarding the erodibilty of soils in the Project area. These characteristics include geographic features such as slope and vegetative cover, as well as physical features of the soil, such as its drainage, runoff, and permeability index.

Soils in the area are dominated by three major soil series: the Rock Creek, Argabak and Vantage series. According to the Natural Resource Conservation Service (NRCS), the

Rock Creek series is well drained with slow to medium runoff and moderately slow permeability, while the Argabak and Vantage are both classified as well drained with slow to very rapid runoff and moderately slow permeability (USDA, 2002a).

Even though soil permeabilities are classified as low and the runoff potential ranges from slow to very rapid, it is anticipated that the erosivity of area soils would be mitigated by factors such as grade (i.e., the majority of soils that would be disturbed in the Project are generally located on grades of 20 percent or less) and the fact that area soils are well drained. Therefore, it is estimated that the erosiveness of native soils immediately underlying the Project would be in the "medium" range. However, as noted above, the erosivity index pertains to in situ (i.e., undisturbed) soils. As a result, the erosiveness index is not directly applicable to soils that would be disturbed by Project construction activities, but rather, to factors such as the effectiveness of Project Best Management Practices such as storm water control procedures.

Applicant has been unable to identify any existing information addressing existing sediment load conditions at the Project site and anticipates that sediment and erosion control practices will minimize or eliminate sediment discharge to drainages. The construction will occur considerable distances from all wetlands, springs, seeps and riparian areas as is further explained below.

Some soil compaction will occur in areas disturbed during temporary construction activities. Several methods of erosion control and storm water pollution prevention will be implemented during Project construction. The erosion control and storm water pollution prevention methods chosen for the site will be selected based on specific site conditions such as topography, surface soils, and vegetative cover. Typical structural controls that could be used include hay bales or silt-fence type materials, rock dams, and recessed grades as illustrated in Figure 3.3.2-1.

The Project consists of individual wind turbine generators (WTGs) having 16-foot foundation diameters that are surrounded by open, undisturbed areas and some gravel surfaces. The Project will therefore generate very little storm water run off. It is not anticipated that surface runoff control facilities beyond the control measures described in Construction Storm Water Pollution Control Measures will be required. There are no storm water conveyance and treatment facilities anticipated in or around the Project site. Specific siting of the control measures will be determined by Project engineers after final design has been completed.

There are no wetlands impacts associated with the Project. No Project facilities or transmission feeder line poles or trails will be built in or near any streambed, riparian corridor or wetlands. There is one stream, Parke Creek, that the BPA transmission feeder line crosses, but the transmission poles will be located at least 200 feet back from the stream bank on either side and there will be no heavy equipment used in the stream bed or riparian corridor for construction. WDFW has reviewed the proposed crossing site and construction techniques and have stated that no hydraulic permit is required. A copy of this letter is included as Exhibit 11.

There are wetlands in the form of seeps, ponds, and springs described above, within the Project area, however all Project facilities will be located a considerable distance from them. Project facilities will be located outside the designated buffers of any wetlands, as required by Section 17A.04.020 "Buffer width requirements" of the Kittitas County Code. The closest Project facility is a turbine access road with an underground collector cable, a low intensity use, which will be located approximately 200 feet away from a small, unnamed spring just east of turbine C-5. The maximum setback that would be required by Washington State Department of Ecology guidelines and EFSEC's proposed rules for Combustion Turbine Standards would be 50 feet. The construction methods and control measures discussed below in 'Construction General Storm Water Pollution Prevention Measures' will be adequate to protect all wetlands and riparian corridors. Please refer to Section 3.3.1, 'Existing Conditions' above for a description of creeks, springs and seeps in the Project area.

A formal Storm Water Pollution Prevention Plan (SWPPP) specifying the types of erosion control methods that will be used at the site will be designed and submitted to EFSEC for approval prior to construction. After construction is completed, temporarily disturbed areas will be returned as closely as possible to their original state. This excludes the access roads, crane pads, rock quarries, O&M facilities, and parking areas, 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.

Construction General Storm Water Pollution Prevention Measures

The Project wind turbines, site roads, underground cables, and other supporting infrastructure are located on high ridge tops with good wind exposure and not in wetlands or watercourses. The site construction plans will include detailed provisions and specifications to help minimize erosion and storm water pollution.

Storm Water Pollution Prevention Plan (SWPPP):

A detailed construction Storm Water Pollution Prevention Plan (SWPPP) will be developed for the Project to help minimize the potential for discharge of pollutants from the site during construction activities. 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. A SWPPP meeting the conditions of the Storm Water General Permit for Construction Activities will be prepared and submitted to EFSEC along with a Notice of Intent (NOI) for construction activities prior to the start of Project construction. The Project NPDES permit application is included as Exhibit 8. The Project will meet the control requirements of the NPDES permit by complying with permit guidelines and statutory requirements.

Applicant will use the Washington Department of Ecology's Stormwater Management Manual for Western Washington. Mark Dirkx of the Department of Ecology indicated, and EFSEC agreed previously, that the Western Washington manual should be used, with some modifications applicable to Eastern Washington conditions, as the Department of

Ecology's Stormwater Management Manual for Eastern Washington (SWMM-EW) has not yet been finalized or adopted.

The SWPPP will include both structural and non-structural best management practices (BMPs). Examples of structural BMPs could include the installation of silt curtains and/or other physical controls to divert flows from exposed soils, or otherwise limit runoff and pollutants from exposed areas of the site. Examples of non-structural BMPs include management practices such as implementation of appropriate materials handling, disposal requirements and spill prevention methods.

Storm Water Pollution Prevention Plan Design:
The SWPPP will be prepared along with a detailed Project grading plan designed by the Engineering, Procurement and Construction ('EPC') Contractor when design-level topographic surveying and mapping are 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 and submitted to EFSEC prior to construction.

A narrative section of the SWPPP will describe the intended installation sequence and function of the selected BMPs, and present the sizing calculations. The plan will also identify the selected minimum standards to which each of the BMPs are to be constructed or installed. When prepared at this level of detail, the document will meet the requirements of the Storm Water Construction Activity NPDES permit system, and will accurately describe to the EPC Contractor, and the Project site construction management team, the improvements and actions required during construction. When complete and submitted to EFSEC, the SWPPP will then be included in the construction bid and contract documents. Implementation of the construction BMPs will be carried out by the EPC Contractor, with enforcement supervised by the Project's environmental monitor who will be responsible for implementing the SWPPP.

Construction Storm Water Pollution Control Measures
Site-specific BMPs will be identified on the construction plans for the site slopes, construction activities, weather conditions, and vegetative buffers. The sequence and methods of construction activities will be controlled to limit erosion. Clearing, excavation, and grading will be limited to the minimum areas necessary for construction of the Project. Surface protection measures, such as erosion control blankets or straw matting, also may be required prior to final disturbance and restoration if potential for erosion is high.

All construction practices will emphasize erosion control over sediment control through such non-quantitative 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.

A more detailed description of the materials, methods and approaches used as part of the BMPs for effective storm water pollution prevention and erosion control are as follows:

Rain Level Monitoring:
The environmental monitor shall be responsible for checking and recording precipitation levels at the Project site using a rain gauge. This benchmark will be used to determine the performance of the SWPPP measures that have been implemented during construction. After construction, the O&M group will also continue to monitor rainfall amounts and monitor the in-place erosion control systems while re-seeded areas become more established. Modifications will be performed where needed by the O&M group after Project construction is completed.

Mulching:
Loose straw shall be spread and punched into the ground in all areas where vegetation has been cleared.

Temporary Straw Bale and Silt Fence Sediment Barriers:
Temporary straw bale barriers and sediment fences shall be inspected by the Contractor immediately after each rainfall and at least daily during prolonged rainfall. Any required repairs, relocations, or additions shall be made promptly. No more than one foot of sediment shall be allowed to accumulate behind straw bales or silt fence sediment barriers. Sediment will be removed and re-graded into slopes. New lines of barriers installed uphill of sediment-laden barriers will be considered based on the rate at which the one foot of sediment accumulates.

Silt fences and straw bale sediment barriers will be maintained throughout the construction period, and beyond, until disturbed surfaces have been stabilized with vegetation. Silt fence construction specifications including fabric type, support spacing, and total length will be determined by actual construction conditions during final design of the facilities.

Check Structures And Sediment Traps:
Check structures, such as rock dams, hay bale check dams, dikes and swales will be used, where appropriate, to reduce runoff velocity as well as to direct surface runoff around and away from cut-and-fill slopes. Swales and dikes

Figure 3.3.2-1 Erosion Control Blankets and Silt Fencing used for Exposed Slope Stabilization as part of a SWPPP

may also be used to direct surface water toward sediment traps.

Matting And Erosion Control Blankets:
Depending upon weather conditions during the construction period, straw or jute matting or other suitable erosion control blankets will be used on the pad slopes and the drainage channel slopes if direct rainfall on the slopes will result in erosion prior to stabilization (see Figure 3.3.2-1).

Control of Excavation De-Watering:
While no de-watering is anticipated, excavation work requiring de-watering discharge will be directed to the surrounding upland areas, away from sensitive resources (e.g. wetlands, drainages, and seeps). De-watering water will be pumped through a hose which will be moved as the water is pumped out to distribute the ground water over a large surface area to allow it to evaporate and/ or infiltrate and avoid causing increased erosion or storm water pollution. There will be no direct discharge to surface waters or riparian areas from de-watering activities.

No Project facility will be located closer than approximately 200 feet from a riparian area, although the maximum setback that would be required by WDOE guidelines and EFSEC's proposed rules for Combustion Turbine Standards would be only 50 feet.

Storm Water Pollutants (Waste, Debris, Chemicals):
In addition to erosion and sedimentation control on the Project site, it also is important to reduce potential for chemical pollution of surface waters during construction. Source control is the most effective method of preventing chemical water pollution. All potential pollutants, including waste materials and demolition debris, that occur on-site during construction will be handled and disposed of in a manner that does not cause contamination of storm water.

The only potential water polutants that will be transported and used during construction in significant quantities are diesel fuels and gasoline, which will be transported and stored in accordance with state and federal regulations by appropriately licensed and trained petroleum transport professionals. Other potential water pollutants include lubricating and mineral oils, chemical cleaners, and herbicides in small quantites below state and federal regulatory thresholds. Handling of these materials will be conducted in a manner that is protective of the environment and in accordance with applicable federal and state requirements and with the Best Management Practices and the Spill Prevention, Containment and Control Plan described in Section 3.16.1.3, 'Health and Safety – Impacts of the Proposed Action - Spillage Prevention and Control'.

In the unlikely event of a fuel, oil, or chemical spill, Project personnel will activate the Spill Prevention, Containment and Control Plan described in Section 3.16.1.3, 'Health and Safety – Impacts of the Proposed Action - Spillage Prevention and Control'.

Environmental Monitor:
The proposed environmental monitor will be responsible for locating any necessary clean fill disposal sites for excess excavation spoils. To control the release of sediment from the disposal sites, silt fencing with a straw bale barrier shall be installed on the down slope side of all disposal areas if additional sediment or erosion control measures are determined to be necessary. The site environmental monitor will be responsible for planning, implementing, and maintaining Best Management Practices (BMPs) for:

- Neat and orderly storage of any construction chemicals and spent containers in lined, bermed areas;
- Materials handling and spill prevention procedures;
- Regular disposal of construction garbage and debris using on-site dumpsters.

Revegetation:
All areas that are impacted by the construction outside of the graveled areas and rock quarries will be seeded when there is adequate soil moisture. They will be re-seeded if healthy cover vegetations do not grow. The sediment fence and check dams will remain in place until the impacted areas are well vegetated and the risk of erosion has been eliminated. The Project operations group will remove the sediment fence at this time.

Sand and Gravel General Permit:
As noted in Section 2.2, 'Description of the Proposed Project', three on-site rock quarries are planned to provide road gravel for the Project and an on-site concrete batch plant would be located near the northwest end of the Project site. Exhibit 1-A, 'Project Site Layout' illustrates the location of the Project facilities. Applicant will apply for and obtain a Sand and Gravel General Permit from Washington Department of Ecology prior to construction for the temporary, portable on-site rock crusher and concrete batch plant. Exhibit 7 contains the completed permit application.

<u>*Specific Facility Control Measures*</u>

Foundation Construction Storm Water Pollution Control Measures:
Foundation construction will require significant excavation at each wind turbine location as described in Section 3.1.2.3, 'Earth – Impacts of the Proposed Action - Excavation and Fills'. Excavation materials will be stored adjacent to the foundation holes as the forms, rebar and bolts are assembled and as the concrete cures after it is cast in place. Sediment fences, hay bales or matting will be installed on steeper down slopes near the storage piles as necessary. Once the concrete cures, excavated materials will be used for back filling. In impacted areas adjacent to pads, mulch will be spread and the area will be re-seeded. Cobbles and rocks too large for backfilling will be crushed for gravel, used in rock check-dams or to support other on-site erosion control measures.

Access Roads Storm Water Pollution Control Measures:
Work on the access roads will include grading and re-graveling existing roads and construction of new roads. The site will have gravel roadways which will be generally a

low profile design allowing water to flow over them in most areas. Erosion control measures to be installed during the work on the access roads include:

- The maintenance of vegetative buffer strips between the impacted areas and any nearby 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 sediment type mats downstream of seasonal stream crossings;
- Installation of silt fencing on steeper exposed slopes;
- Planting of designated seed mixes at impacted areas.

Turbines:
At each turbine location, a crane pad area of approximately 4,000 square feet will be graded in place and covered with road rock. During construction, silt fences, hay bales, or matting will be placed on the down slope side of the crane pad areas. Wind turbine equipment such as the blades, tower sections and nacelles will be transported and off-loaded at each turbine location near the foundation and crane pad. After construction, disturbed areas around all crane pad staging areas will be re-seeded with an appropriate seed mix.

Underground Cable Trenching Storm Water Pollution Control Measures:
Underground electrical and communications cables will be placed in 3- to 5-foot-wide trenches along the length of each wind turbine string corridor. In some cases, trenches will run from the end of one turbine string to the end of an adjacent turbine string to link turbines via the underground network. Trenches will be excavated from 1.5 to 4 feet deep depending on the underlying soil/rock conditions. Excavated materials will be piled alongside the cable trenches for back filling after cable installation. The excavated materials will typically remain in an exposed state for approximately two weeks. 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 crushed for gravel, used in rock check-dams or to support other on-site erosion control measures. Finally, the area will be re-seeded with an appropriate seed mix.

Overhead Collector Line Construction Storm Water Pollution Control Measures:
Construction of the overhead pole lines will require excavation for setting of the poles. Excavated materials will be piled alongside the excavations for back filling after pole installation. Pole excavations are typically in an exposed state for approximately one week. Sediment fences, hay bales or matting will be installed on any steep 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 crushed for gravel, used in rock check-dams or to support other on-site

erosion control measures. Finally, the area will be re-seeded with an appropriate seed mix.

Substation Construction Storm Water Pollution Control Measures:
The substation is generally flat and the base area will be graded and covered with a sub-base rock and a graveled surface on top. Foundation and underground trenching excavation spoils will be handled in the same manner as described in the above sections regarding foundations and underground cable trenches. Disturbed areas surrounding the substation perimeter will be contoured to the natural grade, covered in straw mulch, protected for erosion control and re-seeded as appropriate to the adjacent slopes. The main substation transformers, which are filled with mineral oil, are equipped with an oil level meter and float switch. The transformers will be surrounded by oil containment catch trenches around the outer perimeter of their foundations as described in more detail in Section 2.2.3 ' Project Facilities'.

Final Road Grading & Site Clean Up Storm Water Pollution Control Measures:
The Project will use dumpsters or drop boxes from a local waste management company to collect recyclable materials and dispose of waste materials that can not be reused. A final site cleanup will be made before turning the Project over to the O&M group. In accordance with the Erosion & Sediment Control Plan for access road improvement and construction, county roads will be restored to at least their pre-Project condition and to the satisfaction of the Kittitas County Public Works Department.

Cement Batch Plant Storm Water Pollution Control Measures:
The cement batch plant will be located on-site at a central location within a flat area approximately 500' by 500' in size, surrounded by a 1' high earth berm to contain spilled water runoff (see Project Site Layout in Exhibit 1-B).

The batch plant will utilize outdoor stockpiles of sand and aggregate. These stockpiles will be located to minimize exposure to wind. Sediment fences, hay bales or matting will be installed near the storage areas as necessary. Cement will be discharged via screw conveyor directly into an elevated storage silo without outdoor storage. Construction managers will exercise good housekeeping practices and conduct regular cleanings of the plant, storage and stockpile areas to minimize buildup of fine materials.

Following completion of construction activities the Applicant's contractor will rehabilitate the sites by dragging the top of both of the 500' x 500' crushing and batch plant areas with a blade machine and re-seeding the area with a designated seed mixture.

Rock Quarry Storm Water Pollution Control Measures:
A total of three temporary on-site rock quarries are planned for the Project (see Project Site Layout in Exhibit 1-B). Each rock quarry will have a disturbance footprint of approximately 5 acres and the depth will be approximately 10-20 feet depending on the type of rock encountered at each location. Sediment fences, hay bales or matting will be installed near the quarries to control storm water run on and runoff, as necessary.

A rock crusher will be located at one of the three on-site quarry pits for the duration of the construction period. The crusher will be located in an area approximately 500' by 500' in size, surrounded by a 1' high earth berm to contain spill water runoff. This area will be sprayed by a water truck several times each day for dust suppression. The crusher contains several dust-suppression features including screens and water-spray. Effective dust-control measures will be operating at all emission points during operation, including start-up and shut-down periods. During periods of sustained high winds contractors will shut down operation of the rock crusher if reduced visibility poses a safety hazard.

It is not anticipated that surface runoff control facilities beyond the control measures described in 'Construction Storm Water Pollution Control Measures' will be required. Specific siting of the control measures will be determined by Project engineers after final design has been completed. Applicant will provide design assumptions including storm events and plans when they have been completed.

Groundwater:
A review of available literature indicates that groundwater in the Project area is generally available in large quantities. However, water for Project construction activities will not be obtained from groundwater resources directly below the Project site. Instead, water for Project construction will be trucked in by the construction contractor from local providers.

Excavation, drilling, and blasting to construct foundations for the wind turbine generators (WTGs) could penetrate to depths of 35 feet into the overburden and basalt units below the Project site. In the event of a significant rainfall, the foundation excavations could provide a temporary conduit for surface seepage, thus resulting in accelerated recharge to the overburden and basalt aquifers in the immediate vicinity of the foundation site. This in turn could cause a temporary rise in turbidity in groundwater near the foundation excavations. However, the contribution to the groundwater regime from the turbine foundation excavations will be small and potential negative impacts to groundwater are not expected.

In addition, the total annual precipitation in the area is approximately 9 inches. Construction of the WTG foundations is expected to begin during the dry season (August) and continue through mid-January. Therefore, potential impacts to groundwater are are not anticipated because of the low precipitation and low water table typical in the region during this period.

Wind turbines will be constructed on ridges located well above the anticipated local water table. In the unlikely event that groundwater (perched or otherwise) is encountered during excavation and construction activities, and dewatering is required, the water generated during dewatering activities will be discharged to the surrounding upland areas through a hose which will be moved as the water is pumped out to distribute the ground water over a large surface area to allow it to evaporate and/or infiltrate. Groundwater was not observed in test pits excavated to depths ranging from less than 1 to 9 feet at the site during a geotechnical investigation at the Project site (see Exhibit 4, 'Project Site

Geotechnical Data Report'), but in any case, there will be no direct discharge to surface waters or riparian areas from de-watering activities. Because no de-watering activity is anticipated, no de-watering water has been included in calculations for water consumption or vehicle trips.

<u>*Industrial Storm Water Pollution Prevention Measures*</u>

Industrial SWPP:
Similar to the Constuction SWPPP, the Applicant will prepare and define an Industrial SWPPP as part of the final design. A SWPPP meeting the conditions of the Storm Water General Permit for Industrial Activities will be prepared along with a Notice of Intent (NOI) for industrial activities prior to the start of Project operation. The Project will meet the control requirements of the NPDES permit by complying with permit guidelines and statutory requirements.

A Project operations group will be responsible for monitoring the SWPPP measures during the operational period to ensure they continue to function properly. Final designs for the permanent BMPs will be incorporated into the final construction plans and specifications prepared by the civil design engineer. An operations manual for the permanent BMPs will be prepared by the EPC Contractor civil design engineer and the Project's Enginering Team.

The permanent storm water BMPs will include permanent erosion and sedimentation control through site landscaping, grass, and other vegetative cover. The final designs for these permanent BMPs will conform to the Washington Department of Ecology Stormwater Management Manual. It is not anticipated that surface runoff control facilities will be required due to the low volume of rainfall (9 inches per year) at the Project site and the small amount of impervious surfaces spread over a very large area. The O&M facility will occupy a foundation approximately 50 feet by 100 feet. This 5,000 square-foot area will utilize downspouts to shed rainwater from building surfaces. Additional control measures such as French drains will be implemented if necessary. Design plans are not available at this time for the O&M and substation facilities. Applicant will provide design plans including storm event assumptions when they have been completed.

3.3.2.2 Operation

<u>*Surface Water*</u>
Operation of the Project will not require the use of any water for cooling or any other use aside from the limited needs of the Operations and Maintenance facility described below in Section 3.3.2.4, 'Water Use During Operations' below. There will be no industrial wastewater stream from the facility (only domestic type wastewater from the O&M building which will discharge to an on-site septic system) and thus no wastewater will be used, discharged or recycled for plant operations. Therefore, operation of the Project will not result in any discharges to surface water.

As described above, the Applicant will prepare and define a SWPPP as part of the final design. The Project operations group will be responsible for monitoring the SWPPP measures that were implemnted during construction to ensure they continue to function properly. Final designs for the permanent BMPs will be incorporated into the final construction plans and specifications prepared by the civil design engineer. An operations manual for the permanent BMPs will be prepared by the EPC Contractor civil design engineer and the Project's Enginering Team.

The permanent storm water BMPs will include permanent erosion and sedimentation control through site landscaping, grass, and other vegetative cover. The final designs for these permanent BMPs will conform to the Washington Department of Ecology Stormwater Management Manual. It is not anticipated that surface runoff control facilities will be required due to the low volume of rainfall (9 inches per year) at the Project site and the small amount of impervious surfaces spread over a very large area. The O&M facility will occupy a foundation approximately 50 feet by 100 feet. This 5,000 square-foot area will utilize downspouts to shed rainwater from building surfaces. Additional control measures such as French drains will be implemented if necessary. Design plans are not available at this time for the O&M and substation facilities. Applicant will provide design plans including storm event assumptions when they have been completed.

Operational BMPs will be adopted, as part of the SWPPP, to implement good housekeeping, preventive and corrective maintenance procedures, steps for spill prevention and emergency cleanup, employee training programs, and inspection and record keeping practices, as necessary, to prevent storm water pollution.

Examples of good operational housekeeping practices, which will be employed by the Project, include the following:

- Prompt cleanup and removal of spillage;
- Regular pickup and disposal of garbage;
- Regular sweeping of floors;
- HAZMAT data sheet cataloguing and recording; and
- Proper storage of containers.

The oil containment system for the substations will consist of a perimeter containment system, large enough to contain the full volume of transformer mineral oil with a margin of safety, surrounding the main substation transformers. The trough will be poured as part of the transformer concrete foundation or will consist of a heavy oil-resistant membrane that is buried around the perimeter of the transformer foundation.

The trough and/or membrane will drain into a common collection sump area that will be equipped with a sump pump designed to pump rainwater out of the trough to the surrounding area away from nearby surface waters or sensitive areas (e.g. wetlands, springs, seeps). In order to prevent the sump from pumping oil out to the surrounding area, it will be fitted with an oil detection shut-off sensor that will shut off the sump if oil is detected. A fail-safe system with redundancy is built-in to the sump controls since the transformers are also equipped with oil level sensors. If the oil level inside a transformer drops due to a leak in the transformer tank, it will also shut off the sump pump system to prevent it from pumping oil and an alarm will be activated at the substation and into the main project control (SCADA) system. The trough will be large enough to contain the full volume of oil plus 10% reserve volume.

Discharges from the containment system will be directed to upland areas and away from nearby surface waters or sensitive areas (e.g. wetlands, springs, seeps). Discharge from the containment system will be in compliance with laws governing the discharge of oil as specified in the Code of Federal Regulations (CFR) under 40 CFR Part 110.3:

> § 110.3 Discharge of oil in such quantities as "may be harmful" pursuant to section 311(b)(4) of the Act. [see below Note]
>
> For purposes of section 311(b)(4) of the Act, discharges of oil in such quantities that the Administrator has determined may be harmful to the public health or welfare or the environment of the United States include discharges of oil that:
>
> (a) Violate applicable water quality standards; or
>
> (b) Cause a film or sheen upon or discoloration of the surface of the water or adjoining shorelines or cause a sludge or emulsion to be deposited beneath the surface of the water or upon adjoining shorelines. [61 FR 7421, Feb. 28, 1996]
>
> Note: *Act* means the Federal Water Pollution Control Act, as amended 33 U.S.C. 1251 et seq., also known as the Clean Water Act.

Water in the containment system that shows obvious indicators of potentially violating appreciable water quality standards, i.e., the water exhibits an oily sheen as specified under 40 CFR Part 110(b), will be removed from the containment system and disposed of in accordance with applicable federal, state and local laws.

No Project facility will be located closer than approximately 200 feet from a riparian area, although the maximum setback that would be required by WDOE guidelines and EFSEC's proposed rules for Combustion Turbine Standards would be only 50 feet. There would be no setback required by Kittitas County.

The Project operations group will periodically review the SWPPP against actual practice. The plant operators will ascertain that the controls identified in the plan are adequate, and that employees are following them.

Groundwater

The facilities are located ¼ to ½ mile away from local streams and drainages. All excavation and facilities shall be relatively shallow and will not exceed a maximum of 35 feet in depth for the turbine foundations. Although the soils in the area are part of the overburden aquifer, the soils covering the Project area are typically shallow and it is unlikely that groundwater would be encountered in the overburden. It is anticipated that the tower foundations will penetrate through the shallow soils covering the area and will be firmly established in the basalt that underlies the entire Project area. However, 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. Therefore no impacts to the groundwater are expected from the operation of the facility.

There will be no discharges to groundwater from Project operations. Wastewater from the O&M facility will be discharged to a domestic septic tank installed pursuant to the requirements of Kittitas County Environmental Health Department. The septic system will be located just below surface level, and will be a closed system. The septic system design specifications will be developed and submitted to EFSEC for approval prior to construction. Water needs will be limited to bathroom and kitchen use, and general maintenance purposes and is expected to consume less than 1,000 gallons per day. The source of this water is described below in Section 3.3.2.4, 'Water Use During Operations' below.

3.3.2.3 Water Use During Construction

Construction of the Project will require water use for road construction, wetting of concrete, dust control, and other activities. Water consumed during construction activities will be purchased by the EPC Contractor from an off-site vendor with a valid water right and transported to the site in water-tanker trucks. Water supplied will likely be of potable quality and likely chlorinated. No water will be used from the site. Estimated water use for all construction-related needs, including dust control, is approximately 11 million gallons. There will be no water treatment requirements or methods on-site. Environmentally benign dust palliatives such as lignin may be added to water used for dust suppression to improve efficacy and reduce water use. The City of Kittitas has expressed interest in selling water for construction of the Project (included as Exhibit 13), and has confirmed that supplying all of the Project's water requirements would not cause any significant impact on the City's public water supply, even if the period of highest water use occurred during the summer months. The City operates a backup well that could be used to supply Project water requirements, in addition to water supplied from the City of Kittitas water tower. Traffic impacts resulting from water deliveries are addressed in Section 3.15, 'Traffic and Transportation'. Because de-watering at WTG foundations is not anticipated, de-watering trucks have not been included in estimates for truck trips.

The amount of water required for dust control is highly dependent on whether a dust palliative such as lignin is used as well as timing and weather. If lignin or another environmentally safe, non-toxic dust palliative is used, the amount of water used for dust control is reduced by an estimated 50%.

Table 3.3.2-1: Average & Peak Construction Water Consumption		
	Average (gal/min)	Peak (gal/min)
Rock Crusher	83	125
Batch Plant	50	60
Dust control trucks (1,000 gal)	167	667
New road construction	73	293
Total	373	1,144

Estimated water consumption rates are presented above in Table 3.3.2-1. Daily water requirement estimates use an average number that will fluctuate greatly throughout different phases of Project construction. Daily water requirements based on total Project water estimates yield an average requirement of approximately 20,000 gallons per day. However, during periods of intensive water usage for road construction the daily consumption is expected to increase to 220,000 gallons per day.

3.3.2.4 Water Use During Operation

Water necessary for operation of the Project will be purchased from an off-site source, trucked to the site and stored at the operation and maintenance facility. The source of this water has not been determined but many vendors, including the City of Kittitas, exist in the area. Operation of the Project will not result in significant additional demands on public water supplies, as estimated daily water use is substantially less than 1,000 gallons per day during operations. This will not result in a significant long-term increase over current demand.

3.3.3 Comparison of Impacts of the Proposed Scenarios

Construction

There is no significant difference in materials consumed during construction under different Project scenarios. This is because the road, underground trench, and overhead collector line lengths are unchanged under each scenario. It is also because the Large WTG Scenario requires excavation of larger foundations for a smaller number of WTGs while the Small WTG Scenario requires excavation of smaller foundations for a larger number of WTGs. Therefore, the estimated requirements for water during construction are within 5% variance of the estimated 4.2 million gallons under the Large WTG and Small WTG Scenarios.

Operation

The consumption of water during operations will be the same for any of the proposed scenarios.

3.3.4 Impacts of the No Action Alternative

Under the No Action Alternative, the Project would not be constructed or operated, and the environmental impacts described in this section would not occur. The No Action Alternative assumes that future development would comply with existing zoning requirements for the Project area, which is zoned Commercial Agriculture and Forest and Range. According to the County's zoning code, the Commercial Agriculture zone is dominated by farming, ranching, and rural lifestyles, and permitted uses include residential, green houses and agricultural practices. Permitted uses in the Forest and Range zone include logging, mining, quarrying, and agricultural practices, as well as residential uses (Kittitas County 1991). However, if the proposed Project is not constructed, it is likely that the region's need for power would be addressed by user-end energy efficiency and conservation measures, by existing power generation sources, or by the development of new renewable and non-renewable generation sources. Baseload demand would likely be filled through expansion of existing, or development of new, thermal generation such as gas-fired combustion turbine technology. Such development could occur at conducive locations throughout the state of Washington.

A baseload natural gas-fired combustion turbine would have to generate 67 average MW of energy to replace an equivalent amount of power generated by the project (204 MW at 33% net capacity). (An average MW or "aMW" is the average amount of energy supplied over a specified period of time, in contrast to "MW," which indicates the maximum or peak output [capacity] that can be supplied for a short period.) See Section 2.3, 'Alternatives'.

3.3.5 Mitigation Measures

Mitigation measures have been incorporated into the proposed Project design as described throughout the preceding sections. Mitigation measures include avoiding stream crossings to the maximum extent feasible; complying with federal, state, and local ordinances; and implementing a formal SWPPP and best management practices during construction.

3.3.6 Significant Unavoidable Adverse Impacts

There will be no significant unavoidable adverse impacts with regard to water resources.