3.3 WATER

WAC 463-42-322 Natural environment – Water. *The applicant shall provide detailed descriptions of the affected natural water environment, project impacts and mitigation measures and shall demonstrate that facility construction and/or operational discharges will be compatible with and meet state water quality standards. The applicant shall indicate the source and the amount of water required during construction and operation of the plant and show that it is available for this use and describe all existing water rights, withdrawal authorizations, or restrictions which relate to the proposed source.*

(1) Surface water movement/quality/quantity *– The application shall set forth all background water quality data pertinent to the site, and hydrographic study data and analysis of the receiving waters within one-half mile of any proposed discharge location with regard to: Bottom configuration; minimum, average, and maximum water depths and velocities; water temperature and salinity profiles; anticipated effluent distribution and dilution, and plume characteristics under all discharge conditions; and other relevant characteristics which could influence the impact of any wastes discharged thereto.*

(2) Runoff/absorption *– The applicant shall describe how surface water runoff and erosion are to be controlled during construction and operation, how runoff can be reintroduced to the ground for retention to the ground water supply, and to assure compliance with state water quality standards.*

(3) Floods *– The applicant shall describe potential for flooding, identify the five, fifty, one hundred, and five hundred year flood boundaries, and all protective measures to prevent possible flood damage to the site and facility.*

(4) Ground water movement/quantity/quality *– The applicant shall include the results of a comprehensive hydrologic survey, describe the ground water conditions on and near the site and any changes in groundwater movement, quantity, or quality which might result from project construction or operation.*

(5) Public water supplies *– The applicant shall provide a detailed description of any public water supplies which may be used or affected by the project during construction or operation of the facility.*

3.3.1 Surface Water

Operation of the Project will not require the use of any water for cooling or any other use besides the domestic well serving the limited needs of the Operations and Maintenance facility described below in Section 3.3.5, 'Groundwater'. Therefore, operation of the Project is not expected to result in any discharges to surface water. Most Project facilities will be located on exposed ridge tops away from surface waters, as shown in Exhibit 1, 'Project Site Layout'. 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 nearby surface waters. For this reason, a detailed description of surface water quality conditions is not relevant and therefore not provided here.

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 Section 3.3.2, 'Runoff/Absorption', and in greater detail in Section 2.10, 'Surface Water Runoff'. The Project will implement a formal SWPPP and BMPs as described in detail in Section 2.10, 'Surface Water Runoff', 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).

3.3.2 Runoff/Absorption

In general, surface soils on the Project site consist of silty loess that has slow 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 interbedded layers are also present in the upper 10 feet. At most locations on the Project, a cemented layer of alluvium was encountered below the surface loess. This cemented material also has a slow permeability. The presence of both of these slow permeability soils at the site results in a relatively high runoff potential.

3.3.2.1 Construction

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.

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, as described in Section 7.1 'National Pollutant Discharge Elimination System (NPDES) Permit Application'.

The SWPPP will include both structural and non-structural best management practices (BMPs). Examples of structural BMPs could include the installation of silt curtains, mats, hay bails, check dams, silt traps 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 implementation of materials handling, disposal requirements and spill prevention methods.

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 activities, as described in Section 2.10.1 'Stormwater Pollution Prevention Plan (SWPPP).

3.3.2.2 Operations

As described above, the Project 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 Engineering Team's 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 Storm water Management Manual.

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:

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

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. Measures to prevent and mitigate stormwater runoff during both construction and operations are also described in detail in section 2.10, 'Surface Water Runoff'.

3.3.3 Floods

Since Project facilities will be located significantly outside the floodplain of the Yakima River and other water bodies, (the closest road or turbine location to the Yakima River is more than 500 feet in elevation above the level of river) the risk of flood impacts is insignificant and is therefore not discussed here.

3.3.4 Groundwater

Operation of the Project will have minimal impacts to groundwater. For operations, a domestic well will be installed by a licensed installer to serve the operations and maintenance facility. A well using less than five thousand gallons of water a day exempt pursuant to RCW 90.44.040 will be installed to provide water for domestic type use to the operation and maintenance building. The well will be installed by a licensed well contractor, licensed pursuant to Chapter 173-162 WAC, and in compliance with the requirements and standards of Chapter 173-160 WAC. The well will be installed consistent with Kittitas County Environmental Health Department and Washington Department of Ecology requirements for the new domestic wells. This well will provide water for bathroom and kitchen use and is expected to consume less than 1,000 gallons per day. It is unlikely that the Project water use, therefore, would have a direct effect on groundwater quantity, quality, and flow direction in the immediate area below the proposed facilities.

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 tower foundations and other facilities are sufficiently above the water table to avoid any significant impacts to subsurface hydrology. The following section 3.3.5.6, 'Impacts from Project Activities', provides greater detail on this subject.

3.3.4.1 Groundwater 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.

3.3.4.2 Aquifer Description and Hydraulic Characteristics

As noted in the Earth Resources section, the Project is located within the Yakima Fold Belt subprovince 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, the aquifers in the vicinity of the Project have been grouped into two main hydrologic units: the overburden and the basalt aquifers discussed below.

3.3.4.3 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., Yakima River) 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).

3.3.4.4 Basalt Aquifers

Groundwater in the basalts occurs in joints, vesicles, fractures, and in intergranulated 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).

3.3.4.5 Groundwater Quality and Beneficial Use

Groundwater in the area below the proposed Project facilities is used for domestic, irrigation, and other uses. A review of 39 well descriptions in the sections surrounding and within the Project area indicate that while some wells potentially draw water from the overburden aquifer, most of the area's wells penetrate and draw water from the basalt aquifer. A list of the wells in the Project area is provided as Exhibit 13, 'Department of Ecology Well Logs for the Project Area'. Groundwater in the basalt aquifer system is generally suitable for most uses. 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 (USGS, 1994).

3.3.4.6 Impacts from Project Activities

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 the Project will be trucked in by the construction contractor from local providers. For operations, a domestic well will be installed by a licensed installer to serve the operations and maintenance facility. This well will provide water for bathroom and kitchen use and is expected to consume less than 1,000 gallons per day. It is unlikely that the Project water use, therefore, would have a direct effect on groundwater quantity, quality, and flow direction in the immediate area below the proposed facilities.

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 in the vicinity of the foundation excavations. Construction of the WTG foundations, however, is expected to occur during the dry season (late May to late July) and potential impacts to groundwater are considered low because of the short duration of the construction period.

Perched or shallow groundwater zones could be encountered at various places along the turbine strings. In this case, dewatering activities could result in a temporary impact to groundwater resources in the overburden and upper units of the basalt aquifer. However, groundwater was not observed in test pits excavated to depths ranging from 5 to 10 feet at the site during a geotechnical investigation at the Project site (see Exhibit 6, 'Geotech Data Report). In addition,

descriptions of local water wells show that even though there are a number of shallow wells in the Project area (i.e., some wells have been drilled to depths ranging from 57 to 116 feet), most of the wells in the area have been drilled deeper than 150 feet and in some cases are as deep as 720 feet, thus, indicating a correspondingly deep water table for most of the Project area. If dewatering were to occur, the impact to groundwater would be temporary and it is unlikely to affect water wells in the Project area.

3.3.4.7 Hazardous Materials Use and Handling

As noted in Section 4.1.3, 'Releases or Potential Releases of Hazardous Materials to the Environment', minimal quantities of hazardous materials will be present at the Project site during construction and operations. In most cases the presence of these materials would be limited to vehicle and equipment maintenance and refueling. Impacts to groundwater from construction can occur as a result of small spills associated with refueling and maintenance of construction equipment. However, minor spills would be contained and cleaned up immediately by construction crews pursuant to the requirements of a Construction Phase Spill Prevention and Contingency Plan, which will be required, approved and enforced by EFSEC.

3.3.5 Public Water Supplies

Operation of the Project will not result in additional demands on public water supplies. Construction of the Project will require some water from public water supplies for dust suppression, concrete wetting, soil compaction, and other construction activities. Dust control will be provided by the General Contractor or a subcontractor. This temporary demand will not result in a significant increase over current demand.

3.3.6 Water Use During Construction and Operation

Construction of the Project will require considerably more water use than Operation of the Project. Operation of the Project will require only minimal amounts of water use, as detailed below.

3.3.6.1 Construction

Construction of the Project will require water use for road construction, wetting of concrete, dust control, and other activities. During construction, the EPC contractor will arrange for delivery of water to the site via water trucks from a source with an existing water right. Estimated water use for all construction-related needs other than dust control is one million gallons.

The amount of water required for dust control is highly dependent on whether a dust palliative such as lignin (see Section 3.2.4 'Dust') 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 estimated to be roughly one million gallons. If plain water is used for dust suppression, the estimated water use for dust control is four million gallons, depending on the timing of construction and weather (i.e. the need for dust control would be far greater in dry, windy summer conditions than during other times of year.) This large potential difference in water use is largely to the fact that the frequency of dust control application is greatly reduced by using lignin or other palliatives instead of plain water. Total construction water use is thus estimated to be either two million gallons (if lignin is used for dust control) or five million gallons (if plain water is used for dust control.)

3.3.6.2 Operation

As operation of the Project does not require water for cooling, water needs will be minimal. As described in Section 3.3.5, "Groundwater", water will be obtained from an exempt well that will be installed by a licensed installer to serve the operations and maintenance O&M facility. The well will be installed consistent with Kittitas County Environmental Health Department and Washington Department of Ecology requirements. This well will provide water for bathroom and kitchen use, and general maintenance purposes and is expected to consume less than 1,000 gallons per day.