EXHIBIT A: DESCRIPTION OF PROJECT

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A1.0 OVERVIEW OF THE PROJECT

The Public Utility District No. 1 of Chelan County, Washington, (Chelan PUD) owns and operates the 48-MW Lake Chelan Hydroelectric Project (Lake Chelan Project or Project) located on the Chelan River in Chelan County, Washington, approximately 32 miles north of the City of Wenatchee, Washington.

The Lake Chelan Project utilizes the waters of the Lake Chelan drainage basin, which encompasses approximately 924 square miles. The Lake Chelan Project includes a dam and spillway, a 2.2-mile-long tunnel and penstock, and a powerhouse located at the confluence of the Chelan and Columbia rivers.

All elevations are based on the USGS[1] datum used when the Lake Chelan Project was constructed in 1926-1927.

A1.1 RELATIONSHIP OF THE LAKE CHELAN PROJECT TO CHELAN PUD'S SYSTEM

The Lake Chelan Project is the smallest of three FERC-licensed hydroelectric projects owned and operated by Chelan PUD. The other two projects, Rocky Reach and Rock Island, are located on the Columbia River.

The Rocky Reach Hydroelectric Project (FERC No. 2145) (Rocky Reach Project) is located on the Columbia River about seven miles upstream from Wenatchee, Washington. The reservoir formed by the Rocky Reach Project dam, also known as Lake Entiat, extends upstream 42 miles past Chelan Falls to Douglas County PUD's Wells dam (FERC No. 2149). Elevations of the reservoir establish the tailwater levels at the powerhouse of the Lake Chelan Project. The Rocky Reach Project contains 11 generating units, of which seven are rated at 117,000 kilovolt-amperes (kVA) each and four are rated at 132,000 kVA each, all at 0.95 power factor (pf). The total capacity of the 11 units is 1,280,000 kilowatts (kW).

The Rock Island Hydroelectric Project (FERC No. 943) is located on the Columbia River about 20 miles downstream of the Rocky Reach Project and 12 miles downstream of the City of Wenatchee, Washington. The project consists of two powerhouses, one on each side of the river. The powerhouse on the east side of the river contains 11 generating units with a total capacity of 213,000 kW. The powerhouse on the west side of the river (the newer of the two) contains eight generating units, each rated at 51,300 kW. The total combined capacity of the project is 623,000 kW.

[1] All elevations are based on the USGS datum used when the Lake Chelan Project was constructed in 1926-27. To convert to the newer U.S. Coast and Geodetic Survey (USC&GS) datum commonly used on the Columbia River, subtract 1.78 feet.)

A1.2 MAJOR COMPONENTS

The Lake Chelan Project includes a 40-foot-high concrete gravity dam, a 2.2-mile-long concrete-lined tunnel and steel penstock, a surge tank, a powerhouse located near the confluence of the Chelan and Columbia rivers and a switchyard. The powerhouse contains two Francis-turbine generating units with a rated capacity of 24,000 kW per unit. The generators are air-cooled. Five non-project transmission lines travel from the switchyard to outside distribution and transmission substations.

A1.3 PROJECT LANDS

A1.3.1 Project Area Geography and Geology

The Lake Chelan Project lies in a mountain valley on the eastern slope of the Cascade Range in North Central Washington. The Lake Chelan watershed has a drainage area of 924 square miles extending from approximately elevation 9,000 feet at several peaks along the basin divide to elevation 1,100 feet at lake level. The terrain in the basin is rugged with bold topographic relief and prominent landforms that are the result of alpine and continental glaciation. The majority of the basin is forested to the tree line at approximately 6,000 to 7,000 feet. Forest cover varies from dense in the wetter, western part of the basin to sparse in the semi-arid, low-elevation, eastern side of the basin. The bedrock consists of granites and gneisses, which are penetrated by dikes, veins, and sills to the extent that the rock may appropriately be called a migmatite or "mixed rock." The bedrock is overlain in the lower elevations and southern or eastern end of the Chelan Basin by glacial and glaciofluvial sediments in the form of till, moraine, and outwash deposits.

The northern or western end of the lake basin is steeply sloped bare granitic or gneiss bedrock largely free of soil, tills, and slope wash. In the middle portion from Mitchell Creek to Safety Harbor, remnants of small ice marginal terraces remain on the sides of some of the steep tributary valleys. In the southern or eastern end of the basin, the bedrock slopes open up and are more flattened or smoothed by ice action. There, the glacial deposits on the basin side slopes become more evident.

From Wapato Point to the City of Chelan, the ice marginal terraces and strand lines of temporary higher lake levels rest on the underlying ice-scoured surface of the bedrock. The City of Chelan and the Lake Chelan Project dam are founded on glacial till, moraine, and outwash deposits.

Between the damsite and the Columbia River, the geology becomes more complex. The underlying granitic and gneiss bedrock continues throughout the area. The existing river channel does not occupy the ancestral channel, which is located on the northern side of the valley in the vicinity of Beebe Springs. The existing river channel was formed when the Okanogan lobe of the Wisconsin Age continental glacier pushed its way into the Chelan basin blocking the basin and creating Lake Chelan. The area between the City of Chelan and Beebe Springs was filled by outwash sand and gravel deposits as the Okanogan glacier receded. Because of the ice damming of the ancestral channel by the Okanogan glacier, water spilling from Lake Chelan was forced to flow along the south side of the basin and created the existing river channel in the granitic and

gneiss bedrock. The Chelan River bypassed reach (bypassed reach) is 3.9 miles long and has a total drop of 360.5 feet from the dam to the Columbia River.

A1.3.2 Dam/Powerhouse Site Geology

A1.3.2.1 Foundation Conditions

The Lake Chelan Project dam is founded on very dense glacial till consisting of sand, silt, gravel, and boulders deposited by either the Chelan alpine glacier or Okanogan lobe of the continental glacier. The till exposed at the damsite and downstream is very dense and has very low permeability.

The concrete-lined power tunnel begins in the till at the damsite and transitions into the gneiss bedrock along the southern side of the Chelan basin. The tunnel is in bedrock for the remainder of the route to the powerhouse.

The powerhouse is founded on gneiss bedrock along the eastern edge of the Columbia River gorge. The glacial till and gneiss bedrock are considered adequate for the structures founded upon or placed within them.

A1.3.2.2 Faulting

No faults have been reported as existing in the Project foundation area.

A1.3.2.3 Seismicity

The Lake Chelan Project is located in Zone 2 according to Seismic Zone Map 3-A-3 of the FERC Engineering Guidelines for Evaluation of Hydropower Projects. This is an area of moderate seismic activity. A seismic coefficient of 0.10 is applicable for screening projects in Zone 2. The most current evaluation of Project seismicity, completed in 2001, confirms the location within Zone 2 as being appropriate and confirms that 0.10 is an appropriate seismic coefficient for the Project.

A1.3.2.4 Sinkhole Potential

Development of sinkholes at the Project site is not considered to be a significant concern as the structures are located either on rock which is not susceptible to solution activity, or on soils which are judged to be very stable and unlikely to form sinkholes.

A1.3.3 Project Boundary

The Lake Chelan Project boundary extends along the 1,100-foot contour line from the upper end of Lake Chelan near Stehekin, Washington, to the City of Chelan. The Lake Chelan Project boundary continues down both sides of the bypassed reach to the confluence of the Chelan and Columbia rivers.

Approximately 2,000 acres of land lie within the Lake Chelan Project boundary; 1,300 acres are inundated and the other 700 acres are part of Project facilities. This land is owned by the USFS, NPS, several state agencies, Chelan PUD and private property owners. Approximately 465 acres are inundated federal lands.

A2.0 DETAILED DESCRIPTION

A2.1 STRUCTURES

A2.1.1 Dam

The dam is constructed at the lower or southeasterly end of Lake Chelan where it flows into the Chelan River. The dam is a concrete-gravity, steel-reinforced structure approximately 40 feet high and 490 feet long. Incorporated into the dam are a gated spillway section, a trash sluice and a power tunnel intake structure.

Table A-1: Dam Features

Feature	Description
Location	Located at the southeasterly end of Lake Chelan, Chelan County, Washington
Purpose	Power, navigation, water supply, recreation, flood control
Hazard Classification	High
Type	Concrete gravity
Height	40 feet
Crest Length	490 feet
Crest Elevation	1,109 feet maximum 1,104 feet minimum
Crest Width	14.75 feet

A2.1.2 Spillway

The dam includes a gated spillway that allows regulation of Lake Chelan between elevations 1,087 and 1,100 feet. The spillway section, located in the central portion of the dam, consists of eight, 20-foot-wide-by-14-foot-high tainter gates. The spillway crest is at elevation 1,087, and the tops of the gates are at elevation 1,101. Three gates are operated by 10-horsepower (hp), electrically driven, 7.5-ton-capacity, fixed hoists capable of being operated by either local control, remote control from the powerhouse or remote control from Chelan PUD's dispatch center in Wenatchee. Four of the gates are operated by a manually controlled, self-propelled, rail-mounted gate hoist. The gate hoist is driven by a 10-hp electric motor with reduction gearboxes and two sprocket wheels that are all enclosed within a sheet-metal-bodied mobile unit. The remaining gate is operated locally by a 3.8-hp electric motor with a worm gear box. Two sets of stoplog slots are located upstream of the tainter gates for maintenance.

A 10-foot-wide sluiceway at the left end of the tainter gate spillway bays is fitted with wooden stoplogs, which may be removed to pass logs and other floating debris caught upstream of the dam. The stoplogs are handled with two, 1-ton-capacity, electric-motor-driven chain hoists mounted on a fixed structural steel frame on the spillway bridge.

The spillway capacity was reviewed pursuant to Part 12 of the FERC regulations (18 CFR 12.35). The Periodic Safety Inspection Report submitted to the FERC in 1997 found the spillway to have adequate capacity to pass a probable maximum flood (PMF) with a peak inflow to Lake Chelan of 94,800 cubic feet per second (cfs) snowmelt event and a peak outflow of 40,000 cfs. Chelan PUD completed a new probable maximum flood (PMF) determination on Dec. 20, 2001, predicated on a probable maximum rainfall event. The spillway is still considered adequate.

Table A-2: Spillway Features

Feature	Description
Type	Gated
Crest Elevation	1,087 feet
Length	202 feet total; 170 feet hydraulic length
Control	Eight 20-ft-wide x 14-ft-high tainter gates; One 10-ft-wide x 13-ft-high stoplog sluiceway
Gate Hoist Type	One manually controlled, rail-mounted, 10-hp, electric-motor driven hoist (Gates 1, 2, 3, and 4) Three fixed, automated, 10-hp, electric-motor driven hoists (Gates 5, 6, and 8) One fixed manually controlled, 3.8-hp, electric-motor-driven hoist (Gate 7) Two, 1-ton, electric-motor-driven, fixed chain hoists for the stoplogs
Gate Control Location	Rail-mounted hoist – Local Fixed gate hoists – Local, Chelan Powerhouse, Chelan PUD dispatch center in Wenatchee Fixed stoplog hoists - Local
Maximum spill at 1,100-ft elevation	29,000 cfs
Maximum spill at 1,104.1-ft elevation	48,700 cfs (December PMF)

A2.1.3 Intake

The horizontal, reinforced-concrete intake structure for the tunnel is located on the west abutment of the dam. The intake structure contains seven, 17-foot-wide inlet openings protected by sectionalized-steel trashracks extending from elevation 1,068 to elevation 1,091. The trashracks are cleaned manually with rakes while the larger debris is floated to the debris-removal bay located at the left abutment of the spillway. The intake structure also contains 10, 17-foot-wide inlet openings (without trashracks) for a secondary 17-foot-diameter power tunnel that is stubbed off at the dam axis adjacent to the existing power tunnel inlet. This secondary intake was installed for a future addition of third and fourth units, which have not been added.

A 14-foot butterfly valve is located in a valve house at the head of the existing 14-foot-diameter concrete-lined tunnel, which controls the inflow to the tunnel. The valve is used for dewatering the tunnel during inspection and/or maintenance. The butterfly valve is equipped with a 36-inch-

diameter needle bypass valve and is operated from local controls by an electric-motor driver screw operator. The motor is a high-torque, limited-duty motor rated at 8.4 hp and operates at 750 rpm. A stoplog slot is provided upstream of the butterfly valve at the dam for inspection and/or maintenance of the valve. Stoplogs are stored on the intake structure in a covered open-sided shed.

Table A-3: Intake Features

Feature	Description
ACTIVE INTAKE	
Intake Type	Reinforced-concrete side discharge
Maximum Discharge	2.3 kcfs
Top of Intake Tunnel Elevation	1,068 ft
Discharges To	Chelan powerhouse
Size of Opening	Seven, 17 ft wide x 35 ft high
Trashrack Bar Size	¼ in x 2½ in
Trashrack Bar Spacing	2-5/16 in between bars
Trashrack Cleaning	Manual with rakes
Control	Stoplogs
	14 ft butterfly valve
Valve Actuator	Electric-motor driven screw
SECONDARY INTAKE (Inactive)	
Intake Type	Reinforced-concrete side discharge
Maximum Discharge	Zero cfs – Currently blocked at the dam axis
Size of Opening	17 ft wide x 35 ft high
Trashrack Bar Spacing	No trashracks are currently installed
Control	Stoplogs

A2.1.4 Water Conveyance

The 14-foot-diameter tunnel is approximately 2.2 miles long and extends from the intake structure at the dam to the powerhouse. The concrete-lined tunnel extends 10,578 feet at a 0.3-percent grade and then joins a steel-lined tunnel and penstock running down a 35-percent grade 1,000 feet to the powerhouse.

A 45-foot-diameter-by-25-foot-high steel surge tank located on the hillside approximately 700 feet from the powerhouse is connected to the lower portion of the lined tunnel by an 11-foot-diameter, steel-lined shaft. The capacity of the surge tank is 1,260,000 gallons.

The tunnel reduces to 12-foot-diameter and then divides into two, 9-foot-diameter penstock branches leading to 90-inch-diameter butterfly valves before entering the scroll cases of the two turbines.

Table A-4: Water Conveyance Features

Feature	Description
TUNNEL	
Type	Concrete-lined
Construction	Drill and blast
Size	14-ft finished diameter
	15-ft nominal driven diameter
Length/Slope	10,578 ft – concrete-lined tunnel at 0.314% slope
	1,000 ft – steel-lined tunnel and penstock at 35% slope
	11,578 ft – total length
Maximum Flow Capacity	2.3 kcfs
SURGE TANK	
Type	Differential
Construction	Riveted steel
Outer Tank Height	125 ft
Outer Tank Diameter	45 ft
Riser Height	126 ft
Riser Diameter	11 ft
Tank Capacity	1,260,000 gallons
PENSTOCK	
Type	Steel-lined, concrete-encased tunnel
Construction	Riveted steel
Length	Approximately 90 ft
Diameter	14 ft to 12 ft
	Bifurcates to two, 9-ft-diameter pipes
	Reduces to 7.5-ft diameter at turbine shut-off valves

A2.1.5 Powerhouse

The powerhouse is an indoor type approximately 140 feet long by 100 feet wide and 124 feet high. It houses an erection bay and two vertical-axis turbine generator units.

To withstand the higher tailwater levels prevailing after construction of the Rocky Reach Hydroelectric Project (FERC No. 2145), the walls of the Chelan powerhouse required minor reinforcing. This was accomplished in 1961 during the construction of the Rocky Reach Hydroelectric Project.

Although the powerhouse includes a control room from which it was originally operated, equipment and facilities for remote control operation were installed in 1972, and operation since that time has been from the Chelan PUD's dispatch center in Wenatchee, Washington.

Maintenance and servicing of the equipment in the powerhouse is facilitated by an overhead, traveling-bridge crane. The crane has a capacity of 117.5 tons with an auxiliary hook capacity of 25 tons. The crane is powered by electric motors for all movements and is controlled from an operator's cab at one end of the crane bridge.

The four draft tube gates are stored in the gate slots above the 10-foot-wide by 14-foot-high draft tube openings. Individual 10-ton hoists are provided for gate operation.

Table A-5: Powerhouse Features

Feature	Description
STRUCTURE	
Type	Indoor, above-ground powerhouse
Construction	Reinforced cast-in-place concrete below grade Reinforced concrete frame with brick wall superstructure
Approximate Size	140 ft long x 100 ft wide by 124 ft high
Features	Two vertical axis generating units Generator erection bay
CONTROL ROOM	
Location	Local control room is adjacent to the powerhouse The powerhouse is usually operated from Chelan PUD's dispatch center in Wenatchee
Approximate Size – Local Control Room	30 ft x 40 ft
ANCILLARY EQUIPMENT	
Overhead Crane	
Type	Traveling bridge
Main Hook Capacity	117.5 tons
Auxiliary Hook Capacity	25 tons
Draft Tube Gates (four)	
Type	Four steel slide gates
Size	10 ft wide by 14 ft high
Gate Hoist Type	Four 10-ton, electric-motor operated
Gate Control Location	Local

A2.1.6 Tailrace

The Chelan powerhouse tailrace is a 1,700-foot-long channel adjacent to the Chelan River channel. The tailrace discharges into the Columbia River upstream from the community of Chelan Falls, Washington.

Table A-6: Tailrace Features

Feature	Description
Type	Excavated channel
Length	1,700 ft
Average Tailwater Elevation (1980-1999)	709.5 ft (USGS)

A2.1.7 Recreation Facilities

There are several recreation sites located within the Project boundary. Some are accessible by car and others by boat only. There are three facilities that are owned by Chelan PUD. Chelan Riverwalk Park is owned and operated by Chelan PUD. Old Mill Park and Manson Bay Park are owned by Chelan PUD but operated by the Manson Park and Recreation District.

A2.1.8 Public Safety Measures

Chelan PUD has installed various measures to ensure public safety at the Lake Chelan Project. Table A-7 below provides a list of these safety measures. The safety of Project structures is evaluated every five years by an independent consultant per FERC regulations. Chelan PUD also has developed an Emergency Action Plan (EAP) that contains procedures to be undertaken in the event of impending or actual failure of the structures that comprise the dam and intakes. The EAP is revised as necessary, but a major revision is completed at least every five years per FERC regulations.

Table A-7: Public Safety Features

Feature	Description
Dam	Spillway boat barrier Spillway log boom Fencing and gates to prevent access to dam crest Safety signs
Chelan River Bypassed Reach	Erosion control measures to minimize erosion of channel slopes Safety signs Public safety advertisements and on-site inspection prior to flow releases.
Powerhouse	Fencing and gates to prevent access to powerhouse Safety signs
Switchyard	Fencing and gates to prevent access to switchyard Motion sensors to detect rockfalls and unauthorized access Safety signs

A2.1.9 Access Roads

Access to the dam is by way of an unpaved road located off Gorge Road in the City of Chelan.

Access to the powerhouse is via Powerhouse Road off Chelan Falls Road near the community of Chelan Falls. Chelan Falls Road can be reached via Highway 150 off Highway 97A or Highway 97 to Chelan Falls Road.

A2.1.10 Other Structures

Other structures located within the licensed Project boundary include five, 300-hp, 6-stage, 14-inch DC vertical turbine pumps to provide irrigation water when the tunnel is dewatered. Each pump is rated for 2,250 gpm at 435 feet of total dynamic head. The pumps are considered to be part of the licensed Project because they are required to meet irrigation requirements if the tunnel is dewatered.

A2.2 RESERVOIR

Lake Chelan serves as the reservoir for the Project and is a deep, narrow, natural lake extending northwesterly from the City of Chelan, Washington, 50.4 miles up to the head of the lake near Stehekin, Washington. Table A-8 shows the reservoir's features. The maximum width of the lake is 1.8 miles, and there are approximately 118.8 miles of shoreline. The maximum depth of Lake Chelan is 1,486 feet when the lake is at elevation 1,100 feet. Lake Chelan is the third deepest freshwater lake in the United States, behind Crater Lake and Lake Tahoe. It has a maximum surface area of approximately 32,560 acres (ac) and contains 677,400 acre-feet (ac-ft) of usable storage between a minimum elevation of 1,079 feet and a normal maximum elevation of 1,100 feet. The full pool water surface elevation is at 1,098 feet. Gross storage capacity of the Lake Chelan Project is 15.8 million acre-feet.

Table A-8: Reservoir Features

Feature	Description
RESERVOIR	
Normal Maximum Water Surface Elevation	1,100 ft
Full Pool Water Surface Elevation	1,098 ft
Normal Minimum Water Surface Elevation	1,079 ft
Drainage Area	924 sq mi
Length	50.4 mi
Maximum Width	1.8 mi
Average Width	1 mi
Maximum Depth (at 1,100-ft elevation)	1,486 ft
Shoreline Length (at 1,100-ft elevation)	118.8 mi
Usable Storage	677,400 ac-ft
Gross Capacity of Lake Chelan	15.8 million ac-ft
Flooded Area at Normal Maximum Water	32,560 ac

A2.3 TURBINES/GENERATORS

The powerhouse contains two vertical-axis, 34,000-hp, Francis-type turbines that drive generators rated at 24,000 kW each, at 0.8 pf and under a net head of 377 feet. Each turbine is controlled through servomotor-operated wicket gates by a hydraulic governor that receives its speed indication from a permanent magnet generator mounted on the exciter shaft. The governor

oil pressure is supplied by a gear pump direct-connected to a 10-hp, 720-rpm electric motor. A backup pump driven by a water-powered impulse turbine is provided to maintain governor oil pressure if the motor-driven pump fails. At full gate and maximum head, the turbines discharge a maximum combined flow of 2.3 thousand cubic feet per second (kcfs).

The generating units are capable of producing more than the rated output. The units are typically operated at peak efficiency, producing approximately 53 MW. Under ideal conditions, the units are capable of producing 59 MW.

Each turbine is equipped with a butterfly-type shutoff valve. The butterfly valves are 90 inches in diameter and are opened by a hydraulic operator located under a counterweight arm. These valves are closed by gravity when pressure in the hydraulic cylinder is released. The valves can be operated locally and can be closed from the Chelan PUD's dispatch center in Wenatchee.

Each turbine is directly connected to a vertical shaft and air-cooled generator. The thrust load for both the turbine and generator is carried by a thrust bearing located below the generator rotor. Generator neutrals may be solidly grounded through a single-pole, 15-kV, 1,200-ampere (amp) switch or when the switch is open through a potential transformer.

Generator controls are brought to the control room where they are interfaced with supervisory equipment to provide local manual, local automatic and remote automatic control from Chelan PUD's dispatch center in Wenatchee.

The dam and powerhouse were originally designed for the possible future addition of two more units. Expansion of the Project has been studied four times but is currently still not economically feasible (see Section H1.1). Table A-9 shows the main turbine/generator features.

Table A-9: Turbine/Generator Features

Feature	Description
TURBINE	
Number of units	2
Type	Vertical-axis Francis
Manufacturer	I.P. Morris
Rated capacity at 377 ft of head	34,000 hp
Rated flow	1,154 cfs per unit
Rated head	377 ft
Speed	300 rpm
Water supply	Lake Chelan
Discharges to	Chelan tailrace
GENERATOR	
Type	Synchronous
Manufacturer	General Electric
Rated capacity	30,000 kVA
Power factor	0.8

Feature	Description
Voltage	11,000 volts
Speed	300 rpm
GOVERNOR	
Type	Hydraulic
Manufacturer	Woodward
TURBINE SHUTOFF VALVE	
Type	Butterfly valve
Manufacturer	GE Hydro
Diameter	90 in
Operator	Hydraulic cylinder with counterweight
Control	Local and Chelan PUD Dispatch Center in Wenatchee
PRODUCTION	
Average Discharge (1980-1999) 20 years	1,751 cfs
Average Annual Generation (1980 – 1999)	380,871 MWh

A2.4 TRANSMISSION LINES

Five 115-kilovolt (kV) transmission lines connect from the switchyard to the electrical system of Chelan PUD. However, none of these lines is part of the licensed Project.

A2.5 SWITCHYARD

Two three-phase main transformers; eight 115-kV circuit breakers; and transmission-line deadend structures are located in a switchyard approximately 70 feet north of the powerhouse. Power comes from the generators at 11,000 volts and is stepped up to 115,000 volts for transmission through the two main transformers. Each transformer is rated at 37.3 MVA (maximum nameplate rating at forced air at 65°C temperature rise).

A 2,000-amp generator bus operating at generator voltage is provided for flexibility in operation and as a connection point for the station service equipment. Each generator may be directly connected to this bus through 15-kV circuit breakers with associated disconnect switches.

The two three-phase power transformers are each rated for 20/26.7/33.3/37.3 MVA/OA/FA/FA, 55°/65°C. Each unit is connected delta on the 11-kV side and grounded wye on the high side to provide a line voltage of 115,000 volts. Each transformer bank may be directly connected to its generator by a generator circuit breaker or may be connected through circuit breakers to the 11-kV transfer bus. Each transformer is equipped with a deluge system.

A main and transfer bus scheme is used for connection of the two transformers and for transmission lines. A bus-tie breaker is used for interconnecting the main and transfer busses. Table A-10 shows the main switchyard features.

Table A-10: Switchyard Features

Feature	Description
Location	70 ft north of powerhouse
Size	225 ft x 174 ft
Main generator bus	11-kV, 2,000-A, outdoor, enclosed-bus duct
Main transformers	Two each, three-phase, 11/115 kV, 20/26.7/33.3/37.3 MVA, OA/FA/FA
Circuit breakers	115-kV, two SF6 and six oil circuit breakers
Transmission deadend structures	Lattice-steel towers
Surfacing	Crushed rock
Fencing	Chain link with barbed wire
Access	Through powerhouse

A2.6 ADDITIONAL MECHANICAL, ELECTRICAL AND TRANSMISSION EQUIPMENT APPURTENANT TO THE PROJECT

Station service power is provided from the 11-kV generator bus through two 600-amp, oil circuit breakers to two banks of station service transformers. Each bank consists of a three-phase, 11.5-kV-to-480-V, 675-kVA transformer located outside the powerhouse. Each of these transformers supplies a station service bus through a 200-kVA, dry-type transformer located on the second floor of the powerhouse, which steps down 480 volts to 120/240 volts for station power. Eight selector switches are supplied for the eight major loads in the plant. A pair of 15-kV, 400-amp disconnect switches are provided to parallel the 675-kVA, station-service transformers, if necessary, to be energized through one breaker. Two battery chargers are used for a 125-V station battery bank. A separate 48-V battery bank with a charger is used for communications equipment.

The control room includes vertical control boards equipped with manual control switches, analog instruments and protective relays. Both manual and automatic synchronizing means are provided. Supervisory Control and Data Acquisition (SCADA) controls of station operations are provided from the Wenatchee dispatch center via microwave link.

A2.7 LANDS OF THE UNITED STATES

There are approximately 465.5 acres of the Lake Chelan Project located on federal lands managed by the USFS or NPS (Table A-11).

Table A-11: Lands of the United States

Agency	Acreage
U.S. Forest Service	361.42
National Park Service	104.10