

BATTLE CREEK HYDROELECTRIC PROJECT

FERC NO. 1121

LICENSE AMENDMENT APPLICATION

EXHIBIT A

DESCRIPTION OF PROJECT

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Table of Contents

A.0	DESCRIPTION OF PROJECT	A-1
A.1	PROJECT STRUCTURES.....	A-3
<i>A.1.1</i>	<i>Volta Development</i>	<i>A-3</i>
	A.1.1.1 North Battle Creek Reservoir	A-3
	A.1.1.2 North Battle Creek Feeder Diversion Dam.....	A-3
	A.1.1.3 Macumber Reservoir	A-4
	A.1.1.4 Macumber Dam	A-4
	A.1.1.5 Loomis Mill Canal, Armstrong Canal No. 1 and No. 2	A-5
	A.1.1.6 Al Smith Canal	A-5
	A.1.1.7 Lower Mill Creek Canal	A-6
	A.1.1.8 Shingle Creek Canal	A-6
	A.1.1.9 Baldwin–Lake Grace Canal	A-6
	A.1.1.10 Keswick Canal and Dam	A-7
	A.1.1.11 Lake Grace	A-7
	A.1.1.12 Lake Nora	A-7
	A.1.1.13 Volta Intakes and Penstocks	A-7
	A.1.1.14 Volta Powerhouse.....	A-8
<i>A.1.2</i>	<i>Volta 2 Development</i>	<i>A-8</i>
	A.1.2.1 Cross-Country Canal	A-8
	A.1.2.2 Volta 2 Penstock.....	A-9
	A.1.2.3 Volta 2 Powerhouse.....	A-9
<i>A.1.3</i>	<i>South Development.....</i>	<i>A-9</i>
	A1.3.1 South Canal and Dam.....	A-9

A.1.3.2	Soap Creek Feeder and Dam	A-10
A.1.3.3	Cross Country Canal	A-10
A.1.3.4	North Battle Creek Feeder and Dam	A-10
A.1.3.5	Bramlett-Bristol-Benton Canal (Digger Creek Feeder) and Dam.....	A-11
A.1.3.6	Upper Ripley Creek Feeder	A-11
A.1.3.7	Union Canal	A-11
A-A.1.3.8	South Intake and Penstock	A-11
A.1.3.9	South Powerhouse	A-12
<i>A.1.4</i>	<i>Inskip Development</i>	<i>A-12</i>
A.1.4.1	Inskip Canal and Dam	A-12
A.1.4.2	Lower Ripley Creek Feeder and Dam	A-12
A.1.4.3	Eagle Canyon Canal and Pipeline and Dam	A-13
A.1.4.4	Inskip Powerhouse Penstock	A-13
A.1.4.5	Inskip Powerhouse	A-14
<i>A.1.5</i>	<i>Coleman Development</i>	<i>A-14</i>
A.1.5.1	Coleman Canal and Dam.....	A-14
A.1.5.2	Wildcat Canal.....	A-14
A.1.5.3	Pacific Power Canal	A-15
A.1.5.4	Asbury Pipe	A-15
A.1.5.5	Asbury Dam	A-15
A.1.5.6	Coleman Forebay	A-16
A.1.5.7	Coleman Intake and Penstocks	A-16
A.1.5.8	Coleman Powerhouse	A-16
A.2	PROJECT IMPOUNDMENTS	A-17
A.3	POWERHOUSE EQUIPMENT	A-17
A.4	SWITCHING.....	A-20
A.5	PRIMARY TRANSMISSION LINES.....	A-21
A.6	LANDS OF THE UNITED STATES.....	A-21

List of Tables

TABLE A-1. PHASE 1A RESTORATION PROJECT COMPONENTS.....A-1

TABLE A-2. BATTLE CREEK PROJECT IMPOUNDMENTSA-17

TABLE A-3 . PHYSICAL DATA OF THE POWERHOUSES.....A-20

TABLE A-4 . UNITED STATES LANDS WITHIN THE PROJECT BOUNDARY.....A-22

EXHIBIT A

DESCRIPTION OF PROJECT

A.0 DESCRIPTION OF PROJECT

The purpose of this license amendment application is to propose modifications to Battle Creek Hydroelectric Project (Hydroelectric Project) facilities and their operation that will result in the restoration of salmon and steelhead habitat in the watershed. The restoration effort is the result of a joint effort among the Licensee and several federal and state agencies. Briefly, those changes include:

TABLE A-1 PHASE 1A RESTORATION PROJECT COMPONENTS

Site Name	Component
North Battle Creek Feeder Diversion Dam	Install fish screen and ladder Set new minimum instream flow for North Battle Creek Feeder reach ranging from 47 to 88 cfs Improve access road
Eagle Canyon Diversion Dam and Canal	Install fish screen and ladder Remove segment of the Eagle Canyon spring collection facility Set new minimum instream flow for Eagle Canyon reach ranging from 35 to 46 cfs Improve access trail Replace section of Eagle Canyon Canal with buried Pipeline

Site Name	Component
Wildcat Diversion Dam, Pipeline, and Canal	Remove dam, pipeline and canal Improve access roads and trail
Asbury Diversion Dam	Install instream flow release monitoring and recording equipment Set minimum instream flow for Baldwin Creek at 5 cfs Modify dam to provide fish barrier

The descriptions that follow include all facilities in the Hydroelectric Project regardless of whether they are affected by the Restoration Project. The Restoration Project has been divided into two Phases. This description only covers Phase 1A modifications. Facilities that are to be removed in Phase 1A are shown with “~~strike through~~” and new and/or altered facilities in Phase 1A are shown in **Bold** text. (*Italicized* text is provided for information in this FERC license amendment application, but is not intended for inclusion in the resulting license amendment document itself.)

In addition, on December 22, 1998, FERC issued an Order granting the Licensee’s request to amend the Hydroelectric Project license to exclude the transmission lines. FERC’s December 22, 1998, Order became effective on February 23, 2005. FERC staff has requested that the Licensee submit the revised exhibits A, G, J, K, and M as part of this license amendment application. Revisions to the exhibits made solely for the purpose of excluding the non-jurisdictional facilities will be so noted.

The Hydroelectric Project consists of five developments that divert water from the North and South Forks of Battle Creek and a number of tributaries and springs for power generation at Volta, Volta 2, South, Inskip, and Coleman powerhouses. Project facilities include the Volta Development, Volta 2 Development, South Development, Inskip Development, and Coleman Development. These developments are described below. All elevations in this application are National Geodetic Vertical Datum [NGVD] unless otherwise noted; land surveys are based on the Mount Diablo Base and Meridian (MDBM).

A.1 PROJECT STRUCTURES

A.1.1 Volta Development

A.1.1.1 North Battle Creek Reservoir

North Battle Creek Reservoir has a surface area of 76 acres, a usable capacity of 1,090 acre-feet, and a gross capacity of 1,090 acre-feet at elevation 5,563.2 feet.

A.1.1.2 North Battle Creek Feeder Diversion Dam

North Battle Creek Reservoir is formed by a dam across North Fork Battle Creek in Section 20, Township 32 North, Range 3 East. The dam is a rock filled masonry structure with a maximum height of 51 feet, including a 4-foot-high parapet wall on the crest, and a crest length of 439 feet, at elevation 5,563.4 feet. There is a concrete

spillway at the right abutment with an opening 35.7 feet wide by 5 feet deep with a maximum capacity of 2,400 cfs at reservoir elevation 5,567.4 feet (top of parapet). The spillway is equipped with flashboards 5 feet high to allow maximum storage to elevation 5,563.2 feet. There is a mortar-lined, 4 feet wide by 5 feet high, horseshoe-shaped outlet conduit through the dam controlled by a manual slide gate located at the upstream face.

A.1.1.3 Macumber Reservoir

Macumber Reservoir, has a surface area of 85 acres, a usable capacity of 430 acre-feet, and a gross capacity of 430 acre-feet at elevation 4,084.5 feet.

A.1.1.4 Macumber Dam

Macumber Reservoir is formed by a dam across North Fork Battle Creek in Section 15, Township 31 North, Range 2 East. It has a gross storage capacity of 430 acre-feet and floods an area of 85 acres. The dam has a maximum height of 27 feet at the masonry section and a total crest length of 2,425 feet, of which 187 feet are masonry and 2,238 feet are earth and rock fill. The crest of the dam is at elevation 4,092.2 feet. The main spillway is an opening 165 feet wide by 7.7 feet deep with a crest elevation of 4,084.5 feet and a capacity of 1,250 cfs. The dam has a 36-inch-diameter steel outlet pipe encased in grout within the original rectangular outlet conduit. The outlet is controlled by a manual slide gate at its upstream end.

In 1996, a section of the earth-fill dam was rebuilt after it had been breached for many years to allow the reservoir to flood into an adjacent southwest cove. The reconstruction added a new concrete auxiliary spillway that is 120 feet wide with a concrete crest elevation of 4,084.0 feet. In addition, the auxiliary spillway is equipped with a 1-foot-high flashboard structure to provide a maximum storage elevation at 4,085.0 feet before spilling into the southwest cove.

A.1.1.5 Loomis Mill Canal, Armstrong Canal No. 1 and No. 2

Loomis Mill Canal consists of a small diversion dam on Bailey Creek, 3,660 feet of unlined canal, and 33 feet of wood flume with a capacity of 14 cfs. Armstrong Canals No. 1 and No. 2 divert water from Deer Creek and have a combined length of 9,219 feet. The canals are unlined and have a capacity of 10 cfs.

A.1.1.6 Al Smith Canal

Al Smith Canal has a total length of approximately 3.4 miles with a capacity of 45 cfs. It consists of approximately **13,445** feet of unlined canal, **4,381** feet of lined canal, and 298 feet of metal flume. Water is diverted from North Fork Battle Creek into the canal via streambed fill to Lake Grace. *Changes in bold-face reflect ongoing maintenance of the canal system and do not reflect changes resulting from the Restoration Project*

A.1.1.7 Lower Mill Creek Canal

Lower Mill Creek Canal has a total length of approximately 0.8 mile with a capacity of 70 cfs. It consists of about 4,182 feet of unlined canal and 43 feet of lined canal. Water is diverted from Millseat Creek to the Al Smith Canal via a small concrete and wood diversion dam approximately 35 feet wide by 7.5 feet high.

A.1.1.8 Shingle Creek Canal

Shingle Creek Canal has a total length of about 0.75 mile with a capacity of 3 cfs. It consists of approximately 3,910 feet of unlined canal, 59 feet of lined canal, 16 feet of wood flume, and 10 feet of metal flume. Water is diverted from Shingle Creek via a low earthen diversion dam to the Baldwin–Lake Grace Canal.

A.1.1.9 Baldwin–Lake Grace Canal

Baldwin–Lake Grace Canal is a continuation of Shingle Creek Canal and has a total length of approximately 1 mile with a capacity of 4 cfs. It discharges to Lake Grace. There are approximately 4,953 feet of unlined canal and 430 feet of lined canal.

A.1.1.10 Keswick Canal and Dam

Keswick Canal has a total length of approximately 4.2 miles with a capacity of 45 cfs. It consists of approximately 19,461 feet of unlined canal, 2,278 feet of lined canal, and 461 feet of metal flume. Water is diverted into the canal from North Fork Battle Creek to Lake Nora via a concrete and wood dam 56 feet wide by 7 feet high.

A.1.1.11 Lake Grace

Lake Grace is one of two forebays serving Volta Powerhouse and is formed by an earth-filled embankment with a maximum height of 16 feet in Section 4, Township 30 N Range 1 East. It has a gross storage capacity of 46.5 acre-feet and floods an area of 8.5 acres.

A.1.1.12 Lake Nora

Lake Nora is the second of two forebays serving Volta Powerhouse and is formed by an earth-filled dam with a maximum height of 14 feet in Section 4, Township 30 N Range 1 East. It has a gross storage capacity of 14.9 acre-feet and floods an area of 3.5 acres.

A.1.1.13 Volta Intakes and Penstocks

Two independent penstocks serve Volta Powerhouse. The Lake Grace penstock is of riveted and welded steel construction and is 8,954 feet long with diameter varying from

48 inches to 19 inches and a plate thickness of $\frac{1}{4}$ inch to $\frac{3}{4}$ inch. The intake is of steel and concrete construction and is equipped with a steel slide gate for water control.

The Lake Nora penstock is of riveted and welded steel construction and is 6,915 feet long with diameter varying from 40 inches to 19 inches and plate thickness of $\frac{1}{4}$ inch to $\frac{3}{4}$ inch. The intake is of timber construction and is equipped with a steel slide gate for water control.

A.1.1.14 Volta Powerhouse

Volta Powerhouse is a two-level, reinforced concrete outdoor-type powerhouse (51 feet by 49.5 feet) containing a single turbine/generator.

A.1.2 Volta 2 Development

A.1.2.1 Cross-Country Canal

The upper portion of Cross Country Canal that conveys water from Volta Powerhouse tailrace to Volta 2 Powerhouse has a length of 0.6 mile with a capacity of 130 cfs. It consists of 2,243 feet of unlined canal and 1,004 feet of lined canal.

A.1.2.2 Volta 2 Penstock

A single steel penstock 370 feet long with diameter varying from 48 inches to 39.375 inches of welded construction conveys water from the upper Cross Country Canal to the powerhouse. The intake structure is reinforced concrete construction and is equipped with a steel slide gate for water control.

A.1.2.3 Volta 2 Powerhouse

Volta 2 Powerhouse is a single-level, metal structure on a reinforced concrete foundation, indoor-type powerhouse (20 feet by 32 feet) containing a single turbine/generator.

A.1.3 South Development

A1.3.1 South Canal and Dam

South Canal has a total length of approximately 5.7 miles with a capacity of 90 cfs. It consists of approximately 16,370 feet of unlined canal, 3,923 feet of lined canal, 7,302 feet of unlined tunnel, and 2,628 feet of metal flume. Water is diverted into the canal from South Fork Battle Creek via a steel and concrete, rock-filled dam 153 feet wide by 20 feet high.

A1.3.2 Soap Creek Feeder and Dam

Soap Creek Feeder has a total length of 318 feet with a capacity of 18 cfs. It consists entirely of 24-inch-diameter steel pipe. Water is diverted into the pipe from Soap Creek via a concrete dam, 41 feet wide by 10 feet high, and is discharged into South Canal.

A.1.3.3 Cross Country Canal

The lower portion of Cross Country Canal that conveys water from Volta 2 Powerhouse tailrace to South Powerhouse has a length of 4.3 miles with a capacity of 155 cfs. It consists of 11,421 feet of unlined canal and 11,526 feet of lined canal.

A.1.3.4 North Battle Creek Feeder and Dam

North Battle Creek Feeder is a metal flume 600 feet long on steel substructure with a capacity of 50 cfs. Water is diverted into the flume from North Fork Battle Creek via a masonry dam 93 feet wide by 7 feet high and discharged to a junction box feeding Cross Country Canal. **The diversion dam is equipped with a pool and chute fish ladder, and the flume intake is provided with a fish screen housed in a reinforced concrete structure approximately 130 feet long at the head of the flume.** *This facility is to have a new fish ladder and fish screen installed under the Restoration Project. The description includes these changes.*

A.1.3.5 Bramlett-Bristol-Benton Canal (Digger Creek Feeder) and Dam

Bramlett-Bristol-Benton Canal has a length of 0.26 mile with a capacity of 14 cfs. It consists of 1,201 feet of lined canal and 187 feet of 24-inch-diameter steel pipe. Water is diverted into the canal from Digger Creek via a wood and concrete dam, 40 feet wide by 8.5 feet high, and discharged to Cross Country Canal.

A.1.3.6 Upper Ripley Creek Feeder

Upper Ripley Creek Feeder consists of a 15-inch-diameter steel pipe, 239 feet long with a capacity of 8 to 10 cfs. Water is diverted from Ripley Creek via a low concrete dam, 90 feet wide by 4 feet high and discharged to the Cross Country Canal.

A.1.3.7 Union Canal

Union Canal is a continuation of Cross Country Canal at its terminus and has a length of 0.7 mile with a capacity of 255 cfs. It consists of 3,510 feet of unlined canal and 45 feet of lined canal and conveys water from the combined flows of South and Cross Country Canals.

A.1.3.8 South Intake and Penstock

A single steel penstock 1,812 feet long with diameter varying from 72 inches to 48 inches of riveted and welded construction with plate thickness varying from $\frac{1}{4}$ inch to $\frac{3}{4}$ inch is

located downstream of Union Canal. The intake structure is masonry construction and is equipped with two steel slide gates for water control.

A.1.3.9 South Powerhouse

South Powerhouse is a three-level, reinforced concrete outdoor-type powerhouse (47.5 feet by 57.7 feet) containing a single turbine/generator.

A.1.4 Inskip Development

A.1.4.1 Inskip Canal and Dam

Inskip Canal has a length of 4.4 miles with a capacity of 250 cfs. It consists of 6,465 feet of unlined canal, 12,475 feet of lined canal, 5,017 feet of unlined tunnel, and 294 feet of metal flume. Water is diverted into the canal via a masonry dam, 100 feet wide by 28 feet high.

A.1.4.2 Lower Ripley Creek Feeder and Dam

Lower Ripley Creek Feeder has a length of 384 feet with a capacity of 5 cfs and consists of 316 feet of unlined canal and 68 feet of lined canal. Water is diverted from Ripley Creek via a concrete dam, 44 feet wide by 4 feet high, and is discharged to Inskip Canal.

A.1.4.3 Eagle Canyon Canal and Pipeline and Dam

Eagle Canyon Canal has a length of 2.6 miles with a capacity of 90 cfs. It consists of 7,484 feet of unlined canal, 1,569 feet of lined canal, 1,054 feet of unlined tunnel, 3,536 feet of metal flume, and 161 feet of concrete flume. **The diversion dam is equipped with a vertical slot fish ladder. A fish screen and flow regulating gates occupy the initial 120 feet of the canal. Water is diverted into the canal via a masonry dam, 66 feet wide by 11 feet high, and conveyed to Inskip Canal.** *This facility will have a new fish ladder and fish screen installed. The description includes these changes.*

The Eagle Canyon Canal Pipeline is approximately 4,500 feet long with a capacity of 70 cfs. It consists of a buried 54-inch high density polyethylene (HDPE) pipe that bypasses an intermediary section of the Eagle Canyon Canal.

A.1.4.4 Inskip Powerhouse Penstock

A single steel penstock, 3,271 feet long with diameter varying from 72 inches to 60 inches, of riveted and welded types of construction with plate thickness varying from ¼ inch to ¾ inch serves Inskip Powerhouse. The intake structure is masonry construction and is equipped with two steel slide gates for water control.

A.1.4.5 Inskip Powerhouse

Inskip Powerhouse is a three-level, reinforced concrete outdoor-type powerhouse (48.5 feet by 55 feet) containing a single turbine/generator.

A.1.5 Coleman Development

A.1.5.1 Coleman Canal and Dam

Coleman Canal has a length of 9.7 miles with a capacity of 380 cfs. It consists of **29,712** feet of unlined canal, **14,528** feet of lined canal, 389 feet of unlined tunnel, 4,518 feet of steel pipe, and 83 feet of concrete flume. Water is diverted into the canal via Coleman Diversion Dam. Coleman Diversion Dam is a rock-filled masonry dam with a maximum height of 12 feet and a total crest length of about 127 feet.

A.1.5.2 Wildcat Canal

~~Wildcat Canal has a length of 1.9 miles with a capacity of 18 cfs. It consists of 5,530 feet of 24-inch steel pipe, 917 feet of lined canal, and 3,504 feet of unlined canal. Water is diverted from North Battle Creek into the pipe via a masonry dam 55 feet wide by 8 feet high and is discharged into Coleman Canal. This facility is to be decommissioned and removed.~~

A.1.5.3 Pacific Power Canal

Pacific Power Canal has a length of 0.7 mile with a capacity of 30 cfs. It consists of 3,837 feet of unlined canal and 43 feet of lined canal. Water is diverted into the canal from Darrah Creek via a low earthen dam 124 feet wide by 5 feet high and is discharged into Coleman Canal.

A.1.5.4 Asbury Pipe

Asbury Pipe has a length of 0.3 mile. It consists entirely of 3-inch-diameter welded steel pipe with a capacity of 30 cfs. Water is delivered to the pipe via a 200 hp pump drawing water from Baldwin Creek diverted by a concrete and wood dam 100 feet wide by 4 feet high and is discharged into Coleman Canal.

A.1.5.5 Asbury Dam

Asbury Dam is a concrete structure with a maximum height of approximately 7 feet above streambed and a crest length of 100 feet. A 36-inch low level outlet is provided near the middle of the structure. The top of Asbury Dam contains movable flashboards the can be adjusted to calibrate the 5-cfs instream flow release while at the same time dispersing flow downstream. The instream flow release will be gaged and monitored continuously. *This facility is to have an instream flow release structure, gaging station, and a fish passage barrier located downstream installed. This description does not include these changes.*

A.1.5.6 Coleman Forebay

Coleman Forebay is formed by an earth-filled embankment with a maximum height of 20 feet in Section 32, Township 30 N Range 2 West. It has a gross storage capacity of 76.4 acre-feet and floods an area of 10.6 acres.

A.1.5.7 Coleman Intake and Penstocks

Two steel penstocks 3,564 feet and 3,575 feet long, respectively, with diameter varying from 84 inches to 60 inches of riveted and welded construction with plate thickness varying from $\frac{1}{4}$ inch to $\frac{1}{2}$ inch, converge to a single penstock near the powerhouse. The single penstock is welded steel, 138 feet long, and has a diameter varying from 78 inches to 60 inches with a plate thickness of $\frac{3}{4}$ inch. The intake structure is concrete construction and is equipped with two steel wheel gates for water control.

A.1.5.8 Coleman Powerhouse

Coleman Powerhouse is a three-level, reinforced concrete outdoor-type powerhouse (57.7 feet by 46.5 feet) containing a single turbine/generator.

A.2 PROJECT IMPOUNDMENTS

The surface area, elevation, and storage capacity of the Battle Creek Project impoundments are shown in Table A-2.

TABLE A-2 BATTLE CREEK PROJECT IMPOUNDMENTS

Project Impoundment	Normal Maximum Water Surface Area (Acres)	Normal Maximum Water Surface Elevation (Ft)*	Gross Storage Capacity (Acre-Ft)	Usable Storage Capacity (Acre-Ft)
Volta Development				
North Battle Ck. Res.	76	5563.2	1,090	1,090
Macumber Res.	85	4084.5	430	430
Lake Grace	8.5	3478.2	46.5	46.5
Lake Nora	3.5	3429.8	14.9	14.9
Coleman Development				
Coleman Forebay	10.6	937.9	76.4	76.4

* Elevations are NGVD datum

A.3 POWERHOUSE EQUIPMENT

Volta Powerhouse

The single generating unit at Volta Powerhouse is driven by a two-nozzle horizontal shaft impulse (Pelton) turbine rated at 11,500 hp/400 rpm. The turbine operates at a normal gross head of 1,264.5 feet for the Lake Grace nozzle and 1,216.1 feet for the Lake Nora

nozzle. The normal maximum flow is 115 cfs. The generator has a normal operating capacity of 9.0 MW and is rated at 9,500 kVA, 0.9 Power Factor at 4,160 V. A three-phase, 9,500 kVA 4,160/66,000 V transformer steps up the powerhouse voltage to two 60-kV transmission circuits.

Volta 2 Powerhouse

The single generating unit at Volta 2 Powerhouse is driven by a horizontal shaft reaction (Francis) turbine rated at 1,341 hp/730 rpm. The turbine operates at a normal gross head of 125.2 feet. The normal maximum flow is 115 cfs. The generator has a normal operating capacity of 0.9 MW and is rated at 1,138 kVA, 0.9 Power Factor at 2,300 V. A three-phase 1,342 kVA 2,300/13,453 V transformer steps up the powerhouse voltage to the local distribution circuit.

South Powerhouse

The single generating unit at South Powerhouse is driven by a vertical shaft reaction (Francis) turbine rated at 9,000 hp/720 rpm. The turbine operates at a normal gross head of 515.9 feet. The normal maximum flow is **190** cfs. The generator has a normal operating capacity of 7.0 MW and is rated at 7,500 kVA, 0.9 Power Factor at 4,160 V. A three-phase 7,500 kVA 4,160/66,000 V transformer steps up the powerhouse voltage to the single 60-kV transmission circuit.

Inskip Powerhouse

The single generating unit at Inskip Powerhouse is driven by a vertical shaft reaction (Francis) turbine rated at 10,000 hp/600rpm. The turbine operates at a normal gross head of 382.9 feet. The normal maximum flow is 270 cfs. The generator has a normal operating capacity of 8.0 MW and is rated at 8,500 kVA, 0.9 Power Factor at 4,160 V. A three-phase 8,500 kVA 4,160/66,000 V transformer steps up the powerhouse voltage to the single transmission circuit.

Coleman Powerhouse

The single generating unit at Coleman Powerhouse is driven by a vertical shaft reaction (Francis) turbine rated at 16,000 hp/514 rpm. The turbine operates at a normal gross head of 482.1 feet. The normal maximum flow is 340 cfs. The generator has a normal operating capacity of 13.0 MW and is rated at 13,500 kVA, 0.9 Power Factor at 6,600 V. A three-phase 16,000 kVA 6,600/66,000 V transformer steps up the powerhouse voltage to two 60-kV transmission circuits.

Summary of Physical Data

The following tabulation in Table A-3 summarizes the physical data of the plants:

TABLE A-3 PHYSICAL DATA OF THE POWERHOUSES

	Volta	Volta 2	South	Inskip	Coleman
Number of Units	1	1	1	1	1
Static Head	1264/1216 ft.	125	516	383	482
Normal Max. Flow	115 cfs	115 cfs	190 cfs	270 cfs	340 cfs
Prime Mover Cap.	11,500 hp	1,341 hp	9,000 hp	10,000 hp	16,000 hp
Generator Capacity	9.0 MW	0.9 MW	7.0 MW	8.0 MW	13.0 MW
Speed	400 rpm	730 rpm	720 rpm	600 rpm	514 rpm

A.4 SWITCHING

Switching for the Hydroelectric Project plants is under the jurisdiction of the Pit 3

Switching Center (FERC Project No. 233). It is staffed 24 hours per day and monitors the Hydroelectric Project powerhouses and associated water conveyance facilities.

A.5 PRIMARY TRANSMISSION LINES

Volta 2 Powerhouse

Volta 2 Powerhouse is connected to the Licensee's distribution system. A 12,000-volt 3-phase line approximately 0.2 mile long connects Volta 2 Powerhouse to the Volta 1101 distribution circuit.

A.6 LANDS OF THE UNITED STATES

The following information describes land ownership prior to implementation of proposed facility modifications, additions, and decommissioning. Updated information based on final design and location of affected facilities will be provided via corrected Exhibit drawings following implementation of the changes.

In addition, a FERC Order dated December 22, 1998, (85FERC ¶ 61,411) approved a license amendment to exclude non-jurisdictional transmission facilities from the Project, contingent upon receiving all necessary permits from the U.S. Bureau of Land Management (BLM) as appropriate for the continued use of federal lands. The non-jurisdictional facilities included in the Order for the Project are the Volta-Deschutes, Volta-South, South-Inskip, Inskip-Coleman, and Coleman-Coleman Junction 60-kV transmission lines. On February 23, 2005, the Licensee obtained the necessary permit from the BLM. A copy was transmitted to FERC on August 23, 2005. There was a total of 40.65 acres of United States land and approximately 225 acres of private land associated with the transmission lines that have been removed from the Project. The table below reflects these changes.

Lands within the Project Boundary total approximately 1,504 acres of land, of which the Licensee owns approximately 952 acres. Approximately 459 acres are other private lands in which the Licensee has such rights as are needed for Project purposes. Land of the United States that was formerly patented, in which Licensee has rights prior to

reconveyance to the United States, totals 0.78 acre; approximately 93 acres are lands of the United States. Specific tabulation of United States lands within the Project area are presented below in Table A-4:

TABLE A-4 UNITED STATES LANDS WITHIN THE PROJECT BOUNDARY

Exhibit	Township and Range	Section	Acres
K-1	T32N, R3E	20, 21, 28, 29	38.2
K-5	T30N, R1E	2	0.9
K-6	T30N, R1E	10	0.8
K-9	T29N, R1W	2	1.3
K-10	T29N, R1W	4	1.0
K-10	T30N, R1W	34	6.1
K-11	T30N, R1W	29	6.3
K-13	T30N, R2W	28, 32	11.8
K-14	T30N, R3W	26	1.1
K-15	T29N, R1E	2, 3	9.1
K-16	T29N, R1E	12, 13	16.9