

Appendix A

Spreadsheet of Distribution Facilities Calculation

Appendix A: Distribution Facilities Calculation

Legend

S	Substation System
TL	Transmission Line
E	Equipment (see below codes)
R	Radial
OL	Open Loop
LN	Local Network
LSN	Load Serving Network
N	Integrated Network
P	Point-to-Point (PTP)
NT	Network (NT)

Equipment Codes

ACG	Automatic Closing Ground Switch
DS	Disconnect Switch
DS-G	Disconnect Switch (Gang Op.)
DS-QB	Disconnect Switch (Quick Break)
LB	Load Break Disconnect
LDS	Load Drop Parallel Switch
PCB	Power Circuit Breaker

Substation	BPA #	Line / Utility / Equipment Code	Pg. #	Voltage (kV)	R/OL /LN/ LSN/		Investment \$	O&M \$	% Factor	Investment \$ w/ Factor	O&M \$ w/ Factor	Comment
					N	P/NT						
ABERDEEN	S	ABERDEEN SUBSTATION	19	115	OL	NT	5,330,243	260,708	50%	2,665,122	130,354	
ACTON	S	ACTON SUBSTATION	16	115	R	NT	--	--	100%	-	-	
ADAIR	TL	ADAIR TAP TO SALEM-ALBANY #2	7	115	R	NT	353,767	86,535	100%	353,767	86,535	
ADAIR	S	ADAIR SUBSTATION(BPA)	7	115/69	R	NT	506,210	59,977	100%	506,210	59,977	
ADDY	TL	ADDY-COLVILLE #1	27	115	LSN	P	42,251	18,812	100%	42,251	18,812	
ADDY	S	ADDY SUBSTATION	27	115	LSN	P	7,141,010	157,129	50%	3,570,505	78,564	1, 2 & 3 TAP
ALBANY	TL	ALBANY-LEBANON NO 1	8	115	R	NT	1,079,111	76,287	100%	1,079,111	76,287	Serves load and interconnect 122MVA Gen.?
ALBANY	TL	ALBANY-EUGENE #1	8	115	OL	P/NT/NT	4,632,722	139,715	100%	4,632,722	139,715	33% PTP, 67% NT
ALBANY	S	ALBANY SUBSTATION	8	115/12.5	N	P	--	--	100%	-	-	Determined as Network and Utility Delivery
ALBENI FALLS	TL	ALBENI FALLS-PINE STREET NO 1	26	115	N	NT	--	--	100%	-	-	
ALBENI FALLS	S	ALBENI FALLS SUBSTATION	26	115	R	NT	1,096,932	55,724	25%			28 MW Generator Interconnect
ALCOA	TL	ALCOA-FELIDA NO 1	17	115	R	P	36,090	5,371	100%	36,090	5,371	
ALCOA	S	ALCOA SUBSTATION	17	115	N	P	668,497	16,228	0%	-	-	
ALDERWOOD	S	ALDERWOOD SUBSTATION	5	115/12.5	R	NT	--	--	100%	-	-	
ALFALFA	S	ALFALFA SUBSTATION	15	115	R	NT	1,520,391	63,458	100%	1,520,391	63,458	
ALLSTON	TL	LONGVIEW-ALLSTON #4	18	115	LN	NT	658,953	210,348	100%	658,953	210,348	
ALLSTON	TL	ALLSTON-ASTORIA #1	18	115	LSN	P/NT/P	NO DATA	NO DATA	0%	-	-	67% PTP, 33% NT
ALVEY	TL	HAWKINS-ALVEY #1	5	115	LN	P	146,791	23,244	100%	146,791	23,244	
ANDERSON RANCH P.H.	TL	ANDERSON RANCH-MOUNTAIN HOME NO 1	1A	115	R	NT	--	--	100%	-	-	
BADGER CANYON	E	(2) DS-QB @ ZEPHYR HEIGHTS TAP	11	115	R	P	--	--	100%	-	-	
BADGER CANYON	E	(2) DS-QB @ NINE CANYON TAP	11	115	R	P	--	--	100%	-	-	
BADGER CANYON	TL	FRANKLIN-BADGER CANYON #1	11	115	N	NT	1,733,993	15,804	0%	-	-	
BADGER CANYON	TL	BADGER CANYON-RICHLAND #1	11	115	LN	NT	624,512	9,488	100%	624,512	9,488	
BADGER CANYON	TL	MCNARY-BADGER CANYON #1	11	115	N	NT	2,651,225	31,245	0%	-	-	
BALD MOUNTAIN	TL	BALD MOUNTAIN-N. BONNEVILLE ANNEX	16	115	R	NT	NO DATA	NO DATA				
BANDON	TL	BANDON-ROGUE NO 1	6	12.5	LSN	P	--	--	0%	-	-	Determined as Network
BANDON	S	BANDON SUBSTATION	6	115/12.5	R	NT	3,428,347	109,190	50%	1,714,174	54,595	
BAXTER	S	BAXTER SUBSTATION(SOLD, SEE NOTES))	14	115	R	NT	15,519	1,241	100%	15,519	1,241	
BEAVER	S	BEAVER SUBSTATION(TILLAMOOK PUD)	7	115	R	NT	302,519	9,129	100%	302,519	9,129	
BEAVER	S	BEAVER SUBSTATION (PGE)	7	115	R	NT	1,279,628	103,416	100%	1,279,628	103,416	Not on one-line diagram
BELLINGHAM	S	BELLINGHAM SUBSTATION(BPA)	29	115	LSN	NT	11,711,270	218,040	80%	9,369,016	174,432	
BENTON	TL	HANFORD NO 2 CONSTRUCTION TAP TO BENTON - 451B N	14	115	R	P	87,163	4,158	100%	87,163	4,158	
BENTON	TL	BENTON-DOE 451B	14	115	LSN	NT	240,845	18,921	100%	240,845	18,921	
BENTON	TL	BENTON-SCOOTENEY #1	14	115	OL	NT	895,866	130,808	100%	895,866	130,808	
BENTON	TL	BENTON-OTHELLO #1	14	115	LSN	P	318,881	13,759	100%	318,881	13,759	
BENTON CITY	S	BENTON CITY SUBSTATION(BENTONCO PUD)	14	115	R	P/NT	15,267	664	100%	15,267	664	50% PTP, 50% NT
BERTELSEN	TL	BERTELSEN-WILLOW CREEK	5	115	LN	P	85,814	6,727	100%	85,814	6,727	
BIG CLIFF P.H.	TL	BIG CLIFF-DETROIT PH NO 1	9	13.8	R	NT	--	--	100%	-	-	
BIGELOW	E	(2) DS-QB, DS-G	26	115	R	NT	NO DATA	NO DATA	100%	-	-	Bell-Trentwood #2 Tap
BLACK CANYON P.H.	TL	BLACK CANYON-EMMETT NO 1	1A	69	R	P	--	--	100%	-	-	
BLACKROCK	S	BLACKROCK SUBSTATION	15	115/12.5	R	NT	10,803	6,560	100%	10,803	6,560	BPA owned equipment in foreign substation
BOARDMAN	S	BOARDMAN SUBSTATION	2	115	R	NT	6,843,106	104,223	30%	2,052,932	31,267	
BOARDMAN	TL	BOARDMAN-IONE NO 1 + Boardman-Ione TL	2	69	R	NT	898,335	44,290	100%	898,335	44,290	
BOARDMAN (PAGE 2)	TL	TOWER ROAD-ALKALI NO 1 + BOARDMAN-TOWER ROAD N	10	115	R	NT	1,075,999	32,200	100%	1,075,999	32,200	
BOARDMAN (PAGE 2)	S	BOARDMAN SUBSTATION	2	115	R	NT	6,843,106	104,223	100%	6,843,106	104,223	
BONNERS FERRY	TL	BONNERS FERRY-SAND CREEK #1 and #2	25	115	LSN	NT	13,295,602	74,238	100%	13,295,602	74,238	
BONNERS FERRY	S	BONNERS FERRY SUBSTATION	25	115/13.8	R	NT	1,414,242	51,984	25%	353,561	12,996	Local load and small generation
BOUNDARY	S	BOUNDARY SUBSTATION	26	115	N	NT	--	--	0%	-	-	Determined as Network; Interconnect generation
BOX CANYON P.H.	TL	BOX CANYON TAP TO COLVILLE-BOUNDARY NO 1	26	115	N	P	--	--	100%	-	-	Determined as network but shows zero values
BOYER	TL	BOYER-TILLAMOOK #1	7	115	LSN	NT	2,203,792	173,573	100%	2,203,792	173,573	
BRASADA	S	BRASADA SUBSTATION (CENTRAL ELECTRIC COOPERATIVE	3	115	R	NT	492,476	30,238	100%	492,476	30,238	
BRASADA	TL	BRASADA-HARNEY NO 1	3	115	R	NT	3,341,117	293,281	100%	3,341,117	293,281	Value includes 3 115kV lines
BRIDGE	S	BRIDGE SUBSTATION	1A	138/34.5	R	P	4,911,447	109,844	100%	4,911,447	109,844	Substation not in powerflow
BRINCKEN'S CORNER	S	BRINCKEN'S CORNER SUBSTATION	13	115/69	R	NT	922,405	30,911	100%	922,405	30,911	
BURBANK	TL	BURBANK TAP TO FRANKLIN-WALLAWALLA NO 1	11	115	R	NT	2,665	769	100%	2,665	769	
BURBANK	S	BURBANK SUBSTATION	11	115/12.5	R	NT	--	--	100%	-	-	
BURNT WOODS	TL	ALBANY-BURNT WOODS (Line 1)	7	115	R	NT	302,519	9,129	100%	302,519	9,129	
BURNT WOODS	S	BURNT WOODS SUBSTATION	7	115/24.9	R	NT	1,817,433	82,727	100%	1,817,433	82,727	
CALTON	TL	CARLTON-MCMINNVILLE NO 1	7	115	LSN	NT	463,769	3,524	100%	463,769	3,524	
CANAL	TL	CANAL-JACKSON (2 LINES)	1A	34.5	OL	P	NO DATA	NO DATA	100%	-	-	
CANAL	TL	CANAL-SECOND LIFT NO 1 & NO 2	1A	34.5	OL	NT	45,035	4,401	100%	45,035	4,401	

Substation	BPA #	Line / Utility / Equipment Code	Pg. #	Voltage (kV)	R/OL /LN/ LSN/		Investment \$	O&M \$	% Factor	Investment \$ w/ Factor	O&M \$ w/ Factor	Comment
					N	P/NT						
CANAL- 1ST & 2nd LIFT	S	BPA-BURLEY IRRIG/IDAHO POWER	1A	115/34.5	LSN	NT/P	1,774,559	42,589	100%	1,774,559	42,589	25% PTP, 75% NT
CANAL- 1st & 2nd LIFT	TL	INTERCONNECTION	1A	115	LSN	NT/P/NT	45,035	4,401	100%	45,035	4,401	25% PTP, 75% NT; Not found in Power Flow
CANBY	S	CANBY SUBSTATION(BPA)	3	230/69	R	NT	1,616,374	48,842	100%	1,616,374	48,842	
CANBY	TL	CANBY TAP TO MALIN-HILLTOP NO1	3	230	R	NT	2,263,227	11,566	100%	2,263,227	11,566	
CAPE HORN	S	CAPE HORN SUBSTATION	17	115	R	NT	28,175	2,681	100%	28,175	2,681	
CARDWELL	TL	COWLITZ-CARDWEL LINE 1	18	115	LN		558,082	20,289	100%	558,082	20,289	
CARDWELL	S	CARDWELL SUBSTATION	18	115	R	NT	2,183,470	87,259	50%	1,091,735	43,630	
CARLTON	TL	CARLTON TAP TO FOREST GROVE-MCMINNVILLE #1	7	115	LN		463,769	3,524	100%	463,769	3,524	
CARSON	TL	CARSON TAP TO UNDERWOOD TAP	16	115	R	NT	267,329	2,312	100%	267,329	2,312	
CARSON	S	CARSON SUBSTATION	16	115	R	NT	2,593	2,389	100%	2,593	2,389	
CASCADE LOCKS	TL	CASCADE LOCKS TAP TO BONNEVILLE PH 1-HOOD RIVER N	16	115	R	NT	7,085	2,681	100%	7,085	2,681	
CASCADE LOCKS	S	CASCADE LOCKS SUBSTATION	16	115/13.8	R	NT	--	--	100%	-	-	Tap prior to Xformer not on powerflow
CATHLAMET	S	CATHLAMET SUBSTATION	18	115	R	NT	59,110	3,637	100%	59,110	3,637	
CEDARVILLE JUNCTION	S	CEDARVILLE JUNCTION SUBSTATION	3	69	R	NT	731,274	108,643	100%	731,274	108,643	
CENTRALIA	TL	CHEHALIS-CENTRALIA NO 1 & NO 2	19	69	LN	NT	2,068,086	72,336	100%	2,068,086	72,336	
CENTRALIA	S	CENTRALIA SUBSTATION	19	69	R	NT	1,680,624	72,537	100%	1,680,624	72,537	B street tap
CHEHALIS	TL	CHEHALIS-RAYMOND #1	19	115	LN	NT	15,249,137	163,227	100%	15,249,137	163,227	
CHEHALIS	S	CHEHALIS SUBSTATION	19	69	LN	NT	15,690,960	729,296	10%	1,569,096	72,930	Line positions serve Corkins
CHEMAWA	TL	CHEMAWA-SALEM ALUMINA NO 1	8	115	R	NT	291,827	15,791	100%	291,827	15,791	
CHEMAWA	S	CHEMAWA SUBSTATION	8	115/57	LSN	P	16,074,934	792,275	50%	8,037,467	396,138	Switching Station, does not serve load.
CHENOWETH	TL	CHENOWETH-HARVEY #1 & #2	16	115	R	NT	163,962	2,010	100%	163,962	2,010	
CHESHIRE	S	CHESHIRE SUBSTATION (EPUD)	5	115	R	P	104,113	1,162	100%	104,113	1,162	
CLARKSTON	TL	TUCANNON RIVER-NORTH LEWISTON #1	13	115	R	NT	11,818,725	117,033	100%	11,818,725	117,033	
CLARKSTON	S	CLARKSTON SUBSTATION	13	115/34.5	R	NT	532,252	38,150	100%	532,252	38,150	
CLATSKANIE	S	CLATSKANIE SUBSTATION (CLATSKANIE PUD)	18	115	R	P	12,340	2,916	100%	12,340	2,916	
CLATSOP	S	CLATSOP SUBSTATION	18	230/115	LSN	P	2,305,509	283,219	100%	2,305,509	283,219	
COLUMBIA	TL	COLUMBIA-ELLENSBURG #1	21	115	LN	NT	1,962,585	50,611	100%	1,962,585	50,611	
COLUMBIA	TL	COLUMBIA-VALHALLA #1 & #2	21	115	LN	NT	480,785	53,025	100%	480,785	53,025	
COLUMBIA	S	COLUMBIA SUBSTATION	21	115	LSN	P	24,349,718	561,079	10%	2,434,972	56,108	
COLUMBIA FALLS	TL	COLUMBIA FALLS-KALISPELL #1	25	115	LSN	NT	397,575	44,641	100%	397,575	44,641	
COLVILLE	TL	COLVILLE-BOUNDARY #1	26	115	LSN	P	4,878,645	50,675	100%	4,878,645	50,675	
CONNEL	TL	CONNELL TAP TO BENTON-SCOOTENEY NO 1	23	115	R	NT	190,017	13,867	100%	190,017	13,867	
CONNEL	S	CONNELL SUBSTATION	23	115	R	NT	746,801	13,478	100%	746,801	13,478	
COSMOPOLIS	TL	SATSUP PARK-COSMOPOLIS #1	19	115	LN	NT	1,105,918	42,489	100%	1,105,918	42,489	
COSMOPOLIS	TL	RAYMOND-COSMOPOLIS #1	19	115	LN		10,746,393	46,886	100%	10,746,393	46,886	
COSMOPOLIS	TL	ABERDEEN TAP TO SATSOP PARK-COSMOPOLIS #1	19	115	LN		1,597,354	8,442	100%	1,597,354	8,442	
COSMOPOLIS	S	COSMOPOLIS SUBSTATION	19	115	OL	NT	1,355,888	99,603	25%	338,972	24,901	
COUGAR	S	COUGAR SUBSTATION	4	115	R	NT	--	--	100%	-	-	Interconnects generator
COUGAR	TL	COUGAR-THURSTON NO 1	4	115	N	NT	--	--	0%	-	-	Carmen PH approx. 87MW
COURT STREET	E	LDS, DS-QB	14	115	R	NT	NO DATA	NO DATA	100%	-	-	
COWLITZ	TL	LONGVIEW-COWLITZ #1	18	115	LN	NT	524,096	12,695	100%	524,096	12,695	
COWLITZ	S	COWLITZ SUBSTATION (BPA)	18	115	R	NT	1,913,272	73,907	50%	956,636	36,954	152 MW Load & 34 MW Gen
COWLITZ	S	COWLITZ SUBSTATION	20	230	N	P	368,188	3,745	0%	-	-	
CRESTON	S	CRESTON SUBSTATION(BPA)	27	115/34.5	R	NT	1,523,306	61,905	100%	1,523,306	61,905	
DAVIS CREEK	S	DAVIS CREEK SUBSTATION	3	115/12.5	R	NT	--	--	100%	-	-	BPA owned in foreign equip. boundary; In Utility Delivery
DAVIS CREEK	TL	DAVIS CREEK TAP TO MILE-HI-ALTURAS	3	115	R	NT	208,342	16,496	100%	208,342	16,496	One Line diagram shows foreign owned not being leased
DAYTON	TL	PACIFICORP POMEROY TAP	12	69	R	NT	NO DATA	NO DATA	100%	-	-	
DAYTON	S	DAYTON SUBSTATION(BPA & COLUMBIA REA)	12	69/24.9	R	NT	--	--	100%	-	-	
DE MOSS	TL	BIG EDDY-DE MOSS	10	115	LN		869,878	155,517	100%	869,878	155,517	
DE MOSS	S	DE MOSS SUBSTATION(BPA)	10	115/69	R	NT	1,613,994	96,265	50%	806,997	48,132	Interconnect generation
DEER PARK	S	DEER PARK SUBSTATION	27	115/13.8	R	P	934,125	32,420	100%	934,125	32,420	
DELENA	S	DELENA SUBSTATION	18	115	R	P	60,981	6,763	100%	60,981	6,763	
DEXTER	S	DEXTER SUBSTATION (LANE ELECTRIC)	4	115	R	NT	24,525	1,445	100%	24,525	1,445	
DISCOVERY	S	DISCOVERY SUBSTATION (N. WASCO PUD)	16	115	R	P	124,219	17,600	100%	124,219	17,600	
DIXIE	S	DIXIE SUBSTATION	1A	115/24.9	R	P	--	--	100%	-	-	
DIXON	S	DIXON SUBSTATION	24	115/69	R	NT	3,481,862	65,552	100%	3,481,862	65,552	
DOE 451B	S	DOE 451 B SUBSTATION	15	115/?	R	NT	21,042	16,769	100%	21,042	16,769	DOE Substation with BPA O&M agreement
Donald NYS	S	DONALD NYS SUBSTATION	18	115	R	NT	9,822	0	100%	9,822	-	
DORENA	S	DORENA SUBSTATION	4	115/34.5	R	NT	195,315	39,051	100%	195,315	39,051	
DORENA	TL	DORENA TAP TO ALVEY-MARTIN CREEK NO. 1	4	115	R	NT	188,421	23,509	100%	188,421	23,509	
DOVER	S	DOVER SWITCHING STATION	25	115	R	NT	18,324	611	100%	18,324	611	

Substation	BPA #	Line / Utility / Equipment Code	Pg. #	Voltage (kV)	R/OL /LN/ LSN/		Investment \$	O&M \$	% Factor	Investment \$ w/ Factor	O&M \$ w/ Factor	Comment
					N	P/NT						
DRAIN	S	DRAIN SUBSTATION	5	115/69	LSN	NT	2,367,059	98,247	50%	1,183,529	49,124	One line shows 12kV loads. PF shows LN.
DRISCOLL	S	DRISCOLL SUBSTATION	18	115	R	P	1,569,835	158,128	33%	518,046	52,182	
DRUMMOND	S	DRUMMOND SUBSTATION	1	161/115	LSN	NT	8,831,867	471,456	100%	8,831,867	471,456	Line/Equip leased by BPA.Serves load & connect to Teton SW.Serves Macks Inn
DRUMMOND	TL	DRUMMOND - MACKS INN NO 1	1	115	R	NT	8,954	256,710	100%	8,954	256,710	
DUCKABUSH	S	(2) DS-QB	30	115	R	NT	37,560	7,683	100%	37,560	7,683	Tap
EAGLE LAKE	S	EAGLE LAKE SUBSTATION	23	115/13.8	R	NT	--	--	100%	-	-	
EAST ELLENSBURG	TL	EAST ELLENSBURG TAP TO COLUMBIA-ELLENSBURG NO 1	21	115	R	NT	356,552	3,400	100%	356,552	3,400	
EAST GRANGEVILLE	S	EAST GRANGEVILLE SUBSTATION	13	115/12.5	R	NT	--	--	100%	-	-	
EAST HILLS	S	EAST HILLS SUBSTATION	1A	138/12.5	R	NT	537,847	24,162	100%	537,847	24,162	
EAST OMAK	TL	EAST OMAK-OROVILLE NO 1	28	115	R	P	13,684	35,961	100%	13,684	35,961	39mi 115 KV for \$13K?
EAST OMAK	TL	EAST OMAK-TONASKET NO 2	28	115	R	P	13,691	21,882	100%	13,691	21,882	20mi 115 KV for \$13K?
EAST OMAK	TL	EAST OMAK TAP TO GRAND COULEE-FOSTER CREEK NO 1	28	115	R	NT	5,127,081	26,360	100%	5,127,081	26,360	
EAST OMAK	S	EAST OMAK SUBSTATION	28	115	R	P	3,994,043	127,842	50%	1,997,021	63,921	Omak Tap
EGYPT	S	EGYPT SUBSTATION	27	115	R	NT	29,691	249	100%	29,691	249	
ELBE	TL	ELBE TAP TO ALDER-LAGRANDE NO1,2	30	115	LSN	NT	1,867,188	23,414	100%	1,867,188	23,414	
ELLENSBURG	TL	ELLENSBURG-MOXEE #1	21	115	LN	P	4,540,019	179,503	100%	4,540,019	179,503	
ELLENSBURG	S	ELLENSBURG SUBSTATION	21	115/34.5	R	NT	1,239,887	211,861	25%	309,972	52,965	
ELMA	E	TRANSFORMER, (2) PCB	19	69/12.5	R	NT	686,902	37,095	100%	686,902	37,095	BPA equipment in customer's substation
ELMO	S	ELMO SUBSTATION(MVP)	25	115	LSN	NT	48,586	449	100%	48,586	449	Connect with Kerr 115
EUGENE	S	EUGENE SUBSTATION	5	115	LSN	NT	6,050,935	143,473	50%	3,025,468	71,737	
EUGENE	TL	EUGENE-ALDERWOOD NO 1	5	115	R	NT/P	3,922,908	41,469	100%	3,922,908	41,469	33% PTP, 67% NT
EUGENE	TL	EUGENE-LANE NO 1	5	115	R	NT	94,409	36,977	100%	94,409	36,977	
EUGENE	TL	EUGENE-BERTELSEN #1	5	115	LN	P	58,755	17,381	100%	58,755	17,381	
EUGENE	TL	EUGENE-ALVEY #2	5	115	N	NT	852,187	59,478	0%	-	-	
FAIRMOUNT	TL	SHELTON-FAIRMOUNT #1	30	115	LSN	P/NT/NT	4,060,392	176,789	100%	4,060,392	176,789	50% PTP, 50% NT
FAIRMOUNT	TL	SHELTON-FAIRMOUNT #2	30	115	LSN	P/NT/NT	3,118,258	114,786	100%	3,118,258	114,786	50% PTP, 50% NT
FAIRMOUNT	S	FAIRMOUNT SUBSTATION	30	115	LSN	NT	14,691,524	257,243	25%	3,672,881	64,311	Tap
FAIRVIEW	S	FAIRVIEW SUBSTATION(BPA)	6	115	R	P	11,035,457	478,472	10%	1,103,546	47,847	
FAIRVIEW	TL	FAIRVIEW-BANDON #1	6	115	LN	NT	1,682,809	131,816	100%	1,682,809	131,816	
FAIRVIEW	TL	FAIRVIEW-BANDON #2	6	115	LN	NT	2,199,172	52,977	100%	2,199,172	52,977	
FERN HILL	S	FERN HILL SUBSTATION	18	115	R	P	13,666	982	100%	13,666	982	
FIDALGO	S	FIDALGO SUBSTATION	29	115	R	P	4,833,589	118,664	100%	4,833,589	118,664	Burrows Bay Corner Tap
FILBERT	S	FILBERT SUBSTATION(CITY OF FOREST GROVE)	7	115	R	NT	15,622	185	100%	15,622	185	
FIRST LIFT	TL	FIRST LIFT-SECOND LIFT SW. STA. #1	1A	34.5	OL	NT	NO DATA	NO DATA	100%	-	-	Not found in PowerFlow
FIRST LIFT	TL	FIRST LIFT-SECOND LIFT SW. STA. #2	1A	34.5	OL	NT	NO DATA	NO DATA	100%	-	-	Not found in PowerFlow
FIRST LIFT	S	FIRST LIFT SUBSTATION	1A	34.5	OL	NT	28,131	0	100%	28,131	-	Not found in PowerFlow
FOREST GROVE	S	FOREST GROVE SUBSTATION	7	115	LN	NT	463,769	3,524	50%	231,885	1,762	
FOREST GROVE	TL	FORESTER GROVE-MCMINNVILLE #1	7	115	LN	NT	1,040,618	59,824	100%	1,040,618	59,824	
FOSSIL	TL	DE MOSS-FOSSIL #1	10	115	LN	P/NT/NT	1,760,436	258,734	100%	1,760,436	258,734	33% PTP, 67% NT; LN - All power flows in
FOSSIL	S	FOSSIL SUBSTATION	10	115	LSN	NT	1,215,681	68,453	50%	607,841	34,227	Serves 2 radial loads, Ties into Maupin 230
FOSTER P.H.	E	DS	9	115	R	NT	--	--	100%	-	-	
FOUR LAKES	TL	CHENEY TAP TO SILVER LAKE-SUNSET	24	115	R	NT	368,940	60,229	100%	368,940	60,229	
FOUR LAKES	TL	FOUR LAKES TAP TO SUNSET-EASTCOLFAX	24	115	LN	NT	238,110	28,620	100%	238,110	28,620	
FOUR LAKES	TL	FOUR LAKES-HAYFORD	24	115	R	NT	NO DATA	NO DATA	100%	-	-	
FRANKLIN	TL	FRANKLIN-RUBY STREET NO 1	11	115	OL	NT	1,347,949	14,358	100%	1,347,949	14,358	
FRANKLIN	TL	BENTON-FRANKLIN #1	11	115	LSN	NT	7,184,421	25,219	100%	7,184,421	25,219	
FRANKLIN	TL	BENTON-FRANKLIN #2	11	115	LN	NT	606,950	25,698	100%	606,950	25,698	
FRANKLIN	TL	FRANKLIN-BADGER CANYON #2	11	115	OL	P	2,122,288	35,209	100%	2,122,288	35,209	
FRANKLIN	S	FRANKLIN SUBSTATION	11	115	R	NT	7,304,404	422,517	20%	1,460,881	84,503	BPA owned equipment in foreign substation
FREEWATER	S	FREEWATER SUBSTATION(BPA)	12	69	R	NT	1,682,349	22,849	100%	1,682,349	22,849	
FROMAN	S	FROMAN SUBSTATION	8	115	R	NT	10,025	1,452	100%	10,025	1,452	
FROMAN	TL	FROMAN TAP TO ALBANY-LEBANON NO 1	8	115	R	NT	592,229	7,658	100%	592,229	7,658	
GARDINER	S	GARDINER SUBSTATION	6	115/13.8	R	NT	--	--	100%	-	-	
GARDINER	TL	TAHKENITCH-GARDINER NO 1	6	115	R	NT	181,891	6,109	100%	181,891	6,109	
GLADE	S	GLADE SUBSTATION	14	115/13.8	R	NT	--	--	100%	-	-	
GLASGOW	S	GLASGOW SUBSTATION	6	115	R	NT	30,939	1,829	100%	30,939	1,829	
GLENN H. BELL	TL	BELL-ADDY #1	26	115	LN	P/NT	4,921,138	80,742	100%	4,921,138	80,742	50% PTP, 50% NT
GLENN H. BELL	E	(3) DS-G, PCB	26	115	N	P	--	--	100%	-	-	
GLENN H. BELL	E	(3) DS-G, PCB	26	115	N	P	--	--	100%	-	-	
GLENN H. BELL	TL	CRESTON-BELL #1	26	115	LN	NT	3,105,752	137,147	100%	3,105,752	137,147	
GLENN H. BELL	TL	BELL-TRENTWOOD #1	26	115	LN	P	708,819	74,500	100%	708,819	74,500	

Substation	BPA #	Line / Utility / Equipment Code	Pg. #	Voltage (kV)	R/OL /LN/ LSN/		Investment \$	O&M \$	% Factor	Investment \$ w/ Factor	O&M \$ w/ Factor	Comment
					N	P/NT						
GLENN H. BELL	TL	BELL-TRENTWOOD #2	26	115	LN	P	586,821	50,388	100%	586,821	50,388	
GOLD BEACH	S	GOLD BEACH SUBSTATION	6	115	R	NT	129,528	14,886	100%	129,528	14,886	Serves 2 radial loads
GOLDENDALE	TL	SPEARFISH TAP TO CHENOWETH-GOLDENDALE NO 1	15	115	N	NT	--	--	100%	-	-	
GOLDENDALE	S	GOLDENDALE SUBSTATION(BPA)	15	115/69	R	NT	1,037,477	66,196	100%	1,037,477	66,196	
GOSHEN	TL	GOSHEN-DRUMMOND	1	115	LSN	NT	16,291,283	266,152	100%	16,291,283	266,152	
GRAND RONDE	S	GRAND RONDE SUBSTATION	7	115	LSN	P	1,234,113	186,150	100%	1,234,113	186,150	
GRAND RONDE	TL	GRAND RONDE-BOYER #1	7	115	LN	P	1,260,158	56,849	100%	1,260,158	56,849	
GRAND RONDE	TL	SALEM-GRAND RONDE #1	7	115	LN	P	5,045,914	70,991	100%	5,045,914	70,991	
GRANDVIEW	TL	GRANDVIEW-RED MOUNTAIN #1	15	115	LN	NT	1,508,056	53,206	100%	1,508,056	53,206	LN - 59MW from Grandview, 3.9 from Red Mountain to serve loads
GRANDVIEW	S	GRANDVIEW SUBSTATION	15	115/34.5	R	NT	3,431,640	141,399	100%	3,431,640	141,399	115kV tap SW Station
GRAYS RIVER	S	GRAYS RIVER SUBSTATION	18	115	R	NT	61,344	7,751	100%	61,344	7,751	
GRD COULEE 115KV SW	TL	GRAND COULEE-FOSTER CREEK #1	27	115	LN	NT	784,647	48,188	100%	784,647	48,188	
GRD COULEE 115KV SW	TL	GRAND COULEE-OKANOGAN #2	27	115	LN	P/NT	954,810	219,891	100%	954,810	219,891	50% PTP, 50% NT
GRD COULEE 115KV SW	TL	GRAND COULEE-CRESTON #1	27	115	LN	P/NT	1,442,822	97,572	100%	1,442,822	97,572	20% PTP, 80%NT
GREEN PETER P.H.	TL	GREEN PETER-LEBANON NO 1	9	115	R	NT	921,543	66,626	100%	921,543	66,626	To serve Gen and Load
GREEN VALLEY	S	GREEN VALLEY SUBSTATION	5	230/69	R	NT	2,787,339	31,090	50%	1,393,670	15,545	
GREENTIMBER	E	GREENTIMBER METER HOUSE	1	115/12	R	P	37,716	427	100%	37,716	427	BPA owned equipment in foreign substation
HALF MOON	S	HALF MOON SUBSTATION(INLAND POWER & LIGHT)	26	115	R	NT	20,346	221	100%	20,346	221	Included Tx line value
HAPPY VALLEY	S	HAPPY VALLEY SUBSTATION	30	230/115	R	NT	3,420,224	69,510	100%	3,420,224	69,510	115KV Feeder
HARNEY	S	HARNEY SUBSTATION(BPA)	3	115	LSN	NT	7,663,206	137,412	50%	3,831,603	68,706	Connects Redmond 230 & Quartz 230
HARRISBURG	S	HARRISBURG SUBSTATION	8	115/12.5	R	NT	--	--	100%	-	-	
HARRISBURG	TL	HARRISBURG TAP TO ALBANY-EUGENE NO 1	8	115	R	NT	15,159	1,621	100%	15,159	1,621	
HARVALUM	S	HARVALUM SUBSTATION	15	115	R	NT	3,172,717	124,606	50%	1,586,358	62,303	
HASKILL	S	HASKILL SUBSTATION	25	230/34.5	R	NT	14,514	18,754	100%	14,514	18,754	
HAT ROCK	S	HAT ROCK SUBSTATION	2	230/115	R	NT	5,098,235	51,398	100%	5,098,235	51,398	Value includes Hat Rock tap value
HATTON	TL	HATTON TAP TO CONNELL	23	115	R	NT	904,801	28,514	100%	904,801	28,514	
HATTON	S	HATTON SUBSTATION(SOLD)	23	115	R	NT	21,007	574	100%	21,007	574	
HAUSER	S	HAUSER SUBSTATION(BPA)	6	115	R	NT	185,541	26,615	100%	185,541	26,615	
HAUSER	S	HAUSER SUBSTATION(CENTRAL LINCOLN PUD)	6	115	R	NT	27,964	124	100%	27,964	124	
HAWKINS	TL	HAWKINS-WILLOW CREEK	5	115	LN	P	477,053	7,097	100%	477,053	7,097	
HAY MILL	E	(2) DS, LB, LDS	1A	138	R	NT	228,286	24,265	100%	228,286	24,265	BPA owned equipment in foreign substation
HEBO	S	HEBO SUBSTATION	7	115	R	NT	389,712	34,279	50%	194,856	17,139	115kV to 20.8kV?
HEDGES	S	HEDGES SUBSTATION(BENTON CO PUD)	11	115	R	P	14,917	279	100%	14,917	279	
HEDGES	TL	HEDGES TAP TO FRANKLIN-BADGERCANYON NO 2	11	115	R	P	197,981	2,780	100%	197,981	2,780	
HEYBURN	S	(12) DS-G, (4) PCB	1A	138	LSN	NT	7,830,374	105,420	50%	3,915,187	52,710	
HEYBURN	TL	HEYBURN-ADELAIDE #1	1A	138	LN	NT	3,956,550	23,513	100%	3,956,550	23,513	
HIDEAWAY	S	HIDEAWAY SUBSTATION (LANE ELECTRIC)	5	115	R	NT	10,530	1,476	100%	10,530	1,476	
HIGHLANDS	S	HIGHLANDS SUBSTATION(BENTON CO PUD)	11	115	OL	P	13,750	1,556	100%	13,750	1,556	
HIGHLANDS	TL	FRANKLIN-BADGER CANYON #2 TAP	11	115	R	P	NO DATA	NO DATA	100%	-	-	
HILLS CREEK	S	HILLS CREEK SUBSTATION	4	115	R	NT	--	--	100%	-	-	Interconnects generator
HILLS CREEK	TL	HILLS CREEK-LOOKOUT POINT NO 1	4	115	R	NT	1,139,277	184,072	50%	569,638	92,036	
HOLCOMB	S	HOLCOMB SUBSTATION	19	115	LSN	NT	623,072	47,937	100%	623,072	47,937	
HOLCOMB	TL	HOLCOME-NAELLE #1	19	115	LN	NT	1,818,658	89,684	100%	1,818,658	89,684	
HOOD RIVER	S	HOOD RIVER SUBSTATION	16	115	R	P	546,340	45,397	100%	546,340	45,397	
HOOD RIVER	S	HOOD RIVER-COOP SERVICE NO 1	16	115/12.5	R	NT	--	--	100%	-	-	
HORSE HEAVEN	S	HORSE HEAVEN SUBSTATION	2	230/115	R	P	2,919,014	74,697	50%	1,459,507	37,349	
IDAHOME	S	IDAHOME SUBSTATION	1A	138/29.4	R	P	464,176	30,903	100%	464,176	30,903	Substation not in powerflow
IONE	S	IONE SUBSTATION	2	69/12.5	R	NT	501,424	21,037	100%	501,424	21,037	
IRBY	S	IRBY SUBSTATION	22	115/12.5	R	NT	337,734	19,874	100%	337,734	19,874	BPA owned equipment in foreign substation
JAMES HUGHES	S	HUGHES SUBSTATION(SALEM ELEC COOP)	8	115	R	NT	40,198	5,383	100%	40,198	5,383	
JENKINS	S	JENKINS SUBSTATION	21	115	R	NT	183,601	1,187	100%	183,601	1,187	
JONES CANYON	S	JONES CANYON SUBSTATION	10	115	N	NT/P	10,386,951	50,576	0%	-	-	50% PTP, 50% NT; Re-assign to generator interconnection
JOSO	E	DS-G, DS-QB	11	115	R	NT	NO DATA	NO DATA	100%	-	-	
JOSO	E	(2) DS-G, DS-QB @ NINE MILE TAP	11	115	R	NT	NO DATA	NO DATA	100%	-	-	
JUNCTION CITY	S	JUNCTION CITY SUBSTATION(BLACHLY-LANE CO ELEC COO	5	115	R	NT	7,288	3,393	100%	7,288	3,393	Added tap to Albany-Eugene value
KALISPELL	S	KALISPELL SUBSTATION(BPA)	25	115/13.8	R	NT	5,339,069	200,268	75%	4,004,302	150,201	
KEELER	TL	KEELER-TILLAMOOK #1	7	115	LSN	NT	3,236,964	447,661	25%	809,241	111,915	Power Flow and One Line topology does not agree
KEELER	TL	KEELER-FOREST GROVE #2	7	115	LSN	NT	534,447	29,992	25%	133,612	7,498	Power Flow and One Line topology does not agree
KEELER	TL	KEELER-ST. JOHNS #2	8	115	LN	P	353,767	86,535	100%	353,767	86,535	
KELLER	TL	KELLER TAP TO GRAND COULEE-OKANOGAN NO 2	27	115	R	NT	4,871,621	84,266	100%	4,871,621	84,266	
KELLER	S	KELLER SUBSTATION	27	115/34.5	R	NT	477,912	20,670	100%	477,912	20,670	

Substation	BPA #	Line / Utility / Equipment Code	Pg. #	Voltage (kV)	R/OL /LN/		Investment \$	O&M \$	% Factor	Investment \$ w/ Factor	O&M \$ w/ Factor	Comment
					LSN/	P/NT						
KENNEWICK	S	KENNEWICK SUBSTATION(BENTON CO PUD)	11	115	R	P	23,070	345	100%	23,070	345	
KENNEWICK	TL	KENNEWICK TAP TO FRANKLIN-BADGER CANYON NO 2	11	115	R	P	23,991	5,533	100%	23,991	5,533	Leads to generator not seen on BPA map
KERR	TL	KERR-KALISPELL	24	115	LSN		1,248,352	254,071	50%	624,176	127,035	
KERR	S	KERR SUBSTATION(BPA)	24	115	N	NT	1,148,217	58,649	0%	-	-	Gen. Interconnection Investmt
KITSAP	TL	KITSAP-BANGOR NO 1	30	115	R	NT	637,130	33,276	100%	637,130	33,276	
KITSAP	S	KITSAP SUBSTATION	30	230/115	LSN	P	12,634,483	335,793	25%	3,158,621	83,948	
KNAPPA	S	KNAPPA SVENSEN SUBSTATION	18	115	R	P	2,188	235	100%	2,188	235	
LA GRANDE	S	LA GRANDE SUBSTATION	2	230/69	R	NT	7,240,507	92,768	50%	3,620,253	46,384	
LA PINE	S	LA PINE SUBSTATION	3	115	OL	NT	11,685,487	227,453	50%	5,842,743	113,727	
LA PINE	TL	TRANSMISSION LINES (MID-STATE)	3	115	R	NT	8,977,985	218,322	100%	8,977,985	218,322	Value includes (3) 115kV lines
LACLEDE	S	LACLEDE SUBSTATION	25	115/13.8	R	NT	--	--	100%	-	-	No Integrated Network Facilities \$
LAKESIDE TAP	S	LAKESIDE SUBSTATION (FEC)	25	230	R	NT	22,744	1,045	100%	22,744	1,045	
LANCASTER	S	LANCASTER SUBSTATION(BPA)	26	230	N	NT	314,848	117,723	0%	-	-	248 MW of Generation Interconneciton
LANE	S	LANE SUBSTATION	5	115	LSN	NT	13,034,585	358,892	20%	2,606,917	71,778	Rainbow Valley tap
LANE	TL	LANE-WENDSTON #1	5	115	LSN	NT/P/NT	3,404,292	209,073	100%	3,404,292	209,073	25% PTP, 75% NT
LANGLOIS	TL	LANGLOIS TAP TO BANDON-ROGUE NO 1	6	115	R	NT	26,783	4,414	100%	26,783	4,414	
LARENE	S	LARENE SUBSTATION (INLAND)	27	115	R	NT	440	194	100%	440	194	
LEBANON	S	LEBANON SUBSTATION	9	115	R	NT	1,414,297	20,873	100%	1,414,297	20,873	
LEVEY	S	LEVEY SUBSTATION	14	115	R	NT	488,961	44,284	100%	488,961	44,284	
LEVEY	TL	FRANKLIN-ICEHARBOR P.H. TAP	14	115	R	NT	NO DATA	NO DATA	100%	-	-	
LEXINGTON	TL	LEXINGTON-DELAMETER NO 1	18	115	R	NT	145,989	0	100%	145,989	-	
LEXINGTON	S	LEXINGTON SUBSTATION	18	115	LSN	NT	3,877,023	62,815	50%	1,938,512	31,407	
LIBBY	TL	LIBBY-BONNERS FERRY #1	25	115	LSN	NT	25,386,503	234,100	100%	25,386,503	234,100	
LIBBY	S	LIBBY SUBSTATION(BPA/FLATHEADELEC)	25	115	R	NT	563,499	29,308	100%	563,499	29,308	Switch yard; BPA noted in segmentation document
LION MTN. TAP	S	LION MOUNTAIN SUBSTATION	25	230	R	NT	12,034	3,754	100%	12,034	3,754	
LONGVIEW	E	LONGVIEW ANNEX I	18	115	R	NT	--	--	100%	-	-	Interconnect generation
LONGVIEW	S	LONGVIEW SUBSTATION	18	115	LSN	NT	31,207,900	631,807	50%	15,603,950	315,903	
LOOKINGGLASS	S	LOOKINGGLASS SUBSTATION(BPA)	4	69	R	NT	309,359	6,554	100%	309,359	6,554	
LOOKOUT POINT	TL	LOOKOUT POINT-ALVEY #1	4	115	LSN	NT	789,546	63,635	100%	789,546	63,635	
LOOKOUT POINT	TL	LOOKOUT POINT-ALVEY #2	4	115	LSN	NT	677,745	64,616	100%	677,745	64,616	Power Flow and One Line topology does not agree
LOPEZ ISLAND	TL	TL TO LOPEZ ISLAND	29	69	R	NT	21,331,208	21,707	100%	21,331,208	21,707	Cables directly serving island
LOPEZ ISLAND	S	LOPEZ ISLAND SUBSTATION(BPA)	29	115/69	R	NT	6,647,819	205,481	100%	6,647,819	205,481	Friday Harbor
LOST RIVER	S	LOST RIVER SUBSTATION	1	230/69	R	NT	1,796,729	58,143	100%	1,796,729	58,143	
LOST RIVER	TL	LOST RIVER-SPAR CANYON NO 1	1	230	R	NT	5,518,064	100,528	100%	5,518,064	100,528	
LYNCH CREEK	S	LYNCH CREEK SUBSTATION	30	115/12.5	R	P	--	--	100%	-	-	
MABTON	S	MABTON SUBSTATION	15	230/12.5	R	NT	1,352,795	25,750	100%	1,352,795	25,750	
MACKS INN	S	MACKS INN SUBSTATION	1	115/46	R	P	429,291	84,531	100%	429,291	84,531	BPA O&M lease
MADISON	S	MADISON SUBSTATION	1	115/46	R	NT	1,480,810	37,259	100%	1,480,810	37,259	
MADISON	TL	MACKS INN-MADISON #1	1	115	R	NT	3,715,691	116,872	100%	3,715,691	116,872	
MAPLETON	S	MAPLETON SUBSTATION	6	115/12.5	R	NT	387,996	41,721	100%	387,996	41,721	
MARTIN CREEK	S	MARTIN CREEK SUBSTATION	4	230/115	LN	P	4,254,903	79,979	50%	2,127,452	39,989	Does not serve load. Feeds Drain and Latham 115k subs.
MARTIN CREEK	TL	MARTIN CREEK-DRAIN NO 1	4	115	LSN	NT	432,052	46,893	100%	432,052	46,893	
MARTIN CREEK	TL	MARTIN CREEK TAP TO ALVEY-FAIRVIEW NO 1	4	115	LSN		11,094	3,341	100%	11,094	3,341	
MAUPIN	TL	MAUPIN-TYGH VALLEY NO 1	10	115	R	NT	340,202	27,620	100%	340,202	27,620	
MCMINNVILLE	S	MCMINNVILLE SUBSTATION	7	115/12.5	LSN	NT	353,767	86,535	50%	176,883	43,267	
MCNARY	S	MCNARY SUBSTATION	2	230/69	N	P	--	--	0%	-	-	
MCNARY	TL	MCNARY-FRANKLIN NO 2	2	115	R	NT	1,639,651	61,222	100%	1,639,651	61,222	
MIDWAY	TL	MIDWAY-BENTON	22	115	LN		3,115,724	43,296	100%	3,115,724	43,296	
MIDWAY	TL	MIDWAY-GRANDVIEW #1	22	115	LN	NT	1,254,400	100,336	100%	1,254,400	100,336	
MIDWAY	TL	MIDWAY-MOXEE #1	22	115	LSN	NT	1,317,266	80,905	100%	1,317,266	80,905	
MILTON	S	MILTON SUBSTATION(CITY OF MILTON FREEWATER)	12	69	R	NT	141,908	19,688	100%	141,908	19,688	
MILTON	TL	MILTON TAP TO WALLA WALLA-PENDLETON NO 1	12	69	OL	NT	2,236,170	12,116	100%	2,236,170	12,116	
MILTON	TL	NEAR MILTON BPA LEASE	12	69	R	NT	NO DATA	NO DATA	100%	-	-	
MINIDOKA	S	MINIDOKA POWERHOUSE	1A	138	LSN	NT	147,898	10,190	100%	147,898	10,190	4 MW of Gen in PF. Powerflow does not match onelines.
MINIDOKA P.H.	TL	MINIDOKA PH-UNITY #1	1A	138	R	NT	2,124,793	103,682	100%	2,124,793	103,682	
MIST	S	MIST SUBSTATION	18	115	R	NT	50,488	11,766	100%	50,488	11,766	
MONMOUTH	TL	SALEM-ALBANY #2	7	115	LN	NT	1,234,113	186,150	100%	1,234,113	186,150	
MOUNTAIN AVENUE	TL	MOUNTAIN AVENUE TAP TO ASHLAND-OAK KNOLL	4	115	R	NT	699,916	8,590	100%	699,916	8,590	
MOUNTAIN HOME JCT.	S	MOUNTAIN HOME SUBSTATION(BPA)	1A	115/138	R	P	--	--	100%	-	-	Generation Interconnection
MOUNTAIN HOME JCT.	S	MOUNTAIN HOME SUBSTATION(IDAHO POWER)	1A	138	R	P	67,338	2,620	100%	67,338	2,620	BPA owned equipment in foreign substation
MOXEE	S	MOXEE SUBSTATION	21	115	LSN	P	2,368,692	82,248	50%	1,184,346	41,124	LSN to Union Gap 230, Interconnect generation at Roza

Substation	BPA #	Line / Utility / Equipment Code	Pg. #	Voltage (kV)	R/OL /LN/ LSN/		Investment \$	O&M \$	% Factor	Investment \$ w/ Factor	O&M \$ w/ Factor	Comment
					N	P/NT						
MOYIE HYDRO PLANT	S	MOYIE SUBSTATION	25	13.8/115	R	NT	32,179	2,626	100%	32,179	2,626	BPA owned equipment in foreign substation
MURRAY	S	MURRAY SUBSTATION	29	230/115	LSN	NT	9,164,934	730,362	50%	4,582,467	365,181	
NASELLE	TL	NASELLE-TARLETT NO 2	19	115	R	NT	3,761,540	81,963	100%	3,761,540	81,963	
NASELLE	TL	NASELLE-TARLETT NO 1	19	115	R	NT	2,501,357	118,298	100%	2,501,357	118,298	
NASELLE	TL	NASELLE TAP TO ALLISTON-ASTORIA #1	19	115	LN	NT	NO DATA	NO DATA	0%	-	-	
NASELLE	S	NASELLE SUBSTATION	19	115	R	NT	4,091,803	157,644	25%	1,022,951	39,411	
NESPELEM	TL	NESPELEM TAP TO GRAND COULEE-OKANOGAN	27	115	R	NT	579	0	100%	579	-	
NILLES CORNER	E	LDS, DS-QB	27	115	R	NT	NO DATA	NO DATA	100%	-	-	
NORTH BENCH	S	NORTH BENCH SUBSTATION	25	115/13.8	R	NT	--	--	100%	-	-	
NORTH BROOKINGS	S	NORTH BROOKINGS SUBSTATION	6	124.71	R	NT	439,706	17,435	100%	439,706	17,435	
NORTH BUTTE	S	NORTH BUTTE SUBSTATION	9	115/12.5	R	NT	--	--	100%	-	-	
NORTH BUTTE	TL	LEBANON-NORTH BUTTE	9	115	R	NT	--	--	100%	-	-	
NORTH CAMAS	TL	BONNEVILLE PH1-NORTH CAMAS #1	17	115	LN	P/NT	453,835	35,534	100%	453,835	35,534	75% PTP, 25% NT
NORWAY	S	NORWAY SUBSTATION	6	115/12.5	R	NT	--	--	100%	-	-	
NOXON	S	NOXON DAM POWERHOUSE	25	230	R	NT	50,959	0	100%	50,959	-	
OAK PARK	E	LDS, ACG	17	115	R	P	NO DATA	NO DATA	100%	-	-	
OAKRIDGE	S	OAKRIDGE SUBSTATION (LANE ELECTRIC)	4	115	LN	NT	156,911	6,918	100%	156,911	6,918	Connects to Dexter 115kV.
ODESSA	S	BPA-AVISTA UTILS	22	115/34.5	LSN	P	816,570	41,641	100%	816,570	41,641	
OLYMPIA	TL	OLYMPIA-SHELTON #1	30	115	LSN	NT	176,884	0	100%	176,884	-	
OLYMPIA	TL	OLYMPIA-SHELTON #2	30	115	LSN	NT	1,510,148	65,741	100%	1,510,148	65,741	
OLYMPIA	TL	OLYMPIA-SOUTH ELMA #1	30	115	LN	NT	931,011	60,795	100%	931,011	60,795	
OLYMPIA	S	OLYMPIA SUBSTATION	30	115	LSN	NT	32,346,348	922,097	30%	9,703,904	276,629	
ORCHARD VIEW	E	LDS,(2) DS	11	115	R	P	NO DATA	NO DATA	100%	-	-	
ORCHARD VIEW	E	LDS,(2) DS @ COLUMBIA CENTER TAP	11	115	R	P	NO DATA	NO DATA	100%	-	-	
OREGON CITY	S	OREGON CITY SUBSTATION	8	115/57	R	P	4,969,744	192,580	50%	2,484,872	96,290	
OREGON CITY	TL	OREGON CITY-CANBY PGE NO 1	8	115	R	P	355,446	19,535	100%	355,446	19,535	
OREGON CITY	TL	KEELER-OREGON CITY #2	8	115	LSN	P	1,349,264	67,309	100%	1,349,264	67,309	No load tapped on line
OREGON CITY	TL	OREGON CITY- CHEMAWA #2	8	115	LSN	P	1,817,433	82,727	100%	1,817,433	82,727	
OUTLOOK	E	DS, DS-G	15	115	R	P	NO DATA	NO DATA	100%	-	-	
OVANDO	S	OVANDO SUBSTATION	24	230/69	LSN	NT	1,485,661	88,499	100%	1,485,661	88,499	
OXBOW	S	OXBOW SUBSTATION(PACIFIC CO PUD)	19	115	R	NT	14,180	1,289	100%	14,180	1,289	
PACIFIC WAY	TL	LEXINGTON-LONGVIEW #1	18	115	LN	NT	684,658	37,754	100%	684,658	37,754	
PALISADES PH	TL	PALISADES PH-SWAN VALLEY	1	115	N	NT	1,276,790	93,197	0%	-	-	Generator interconnection, 40 MW total in power flow
PALISADES PH	TL	PALISADES PH-GOSHEN	1	115	N	NT	13,454,351	0	0%	-	-	Generator interconnection, 40 MW total in power flow
PARKDALE	S	PARKDALE SUBSTATION	16	230/12.5	R	NT	--	--	100%	-	-	
PARKER	TL	PARKER TAP TO EUGENE-ALDERWOOD NO 1	5	115	R	NT	9,970	458	100%	9,970	458	
PE ELL	S	PE ELL SUBSTATIONLEWIS CO PUD)	19	115	R	NT	16,913	443	100%	16,913	443	
PEARL	S	PEARL SUBSTATION	8	115	N	P	--	--	100%	-	-	
PEARL	TL	PEARL-SHERWOOD #1	8	115	N	P	--	--	100%	-	-	
PEARL	TL	PEARL-SHERWOOD #2	8	115	N	P	--	--	100%	-	-	
PENDLETON	S	PENDLETON SUBSTATION	12	115	R	NT	43,283	30,678	100%	43,283	30,678	
PENDLETON	TL	WALLA WALLA-PENDLETON NO 1	12	69	OL	NT	4,066,405	119,031	100%	4,066,405	119,031	
PILOT ROCK	S	PILOT ROCK SUBSTATION	2	69	R	NT	166,943	1,081	100%	166,943	1,081	
POMEROY	S	POMEROY SUBSTATION(BPA)	13	115/69/13	R	NT	85,125	49,910	100%	85,125	49,910	
PORT ANGELES	S	PORT ANGELES SUBSTATION(BPA)	30	115/69	R	NT	17,382,992	733,026	50%	8,691,496	366,513	
PORT ORFORD	S	PORT ORFORD SUBSTATION	6	115/12.5	R	NT	38,845	2,946	100%	38,845	2,946	
POTLATCH	S	POTLATCH SUBSTATION(BPA)	30	115/34.5	R	NT	922,762	43,043	100%	922,762	43,043	
PREIST RIVER	TL	PRIEST RIVER TAP TO ALBENI FALLS-SAND CREEK NO 1	26	115/34.5	R	NT	297,117	22,739	100%			
PREIST RIVER	S	PRIEST RIVER SUBSTATION(BPA)	26	115/34.5	R	NT	784,499	35,020	100%	784,499	35,020	
PROSSER	S	PROSSER SUBSTATION(BENTON CO PUD)	15	115	R	P	12,087	1,240	100%	12,087	1,240	
PROSSER	TL	PROSSER TAP TO GRANDVIEW-RED MOUNTAIN NO 1	15	115	R	P	719,927	10,924	100%	719,927	10,924	
RATTLESNAKE	S	RATTLESNAKE SUBSTATION(BENTONREA)	15	115	R	NT	43,829	306	100%	43,829	306	
RAYMOND	S	RAYMOND SUBSTATION	19	115	R	NT	2,852,353	192,218	50%	1,426,176	96,109	
RAYMOND	TL	RAYMOND-HENKLE ST. NO 1	19	115	R	NT	85,625	4,242	100%	85,625	4,242	
RAYMOND	TL	RAYMOND-WILLAPA RIVER NO 1	19	115	R	NT	378,475	38,240	100%	378,475	38,240	
RAYMOND	TL	RAYMOND-CHEHALIS #1	19	115	LN	NT	15,249,137	163,227	100%	15,249,137	163,227	
REATA	TL	BADGER CANYON-REATA NO 1	14	115	R	P	352,148	6,424	100%	352,148	6,424	3.25mi Tx NO DATA
RED MOUNTAIN	TL	RED MOUNTAIN-WHITE BLUFFS #1	14	115	LSN	NT	1,184,011	33,081	100%	1,184,011	33,081	
RED MOUNTAIN	S	RED MOUNTAIN SUBSTATION	14	115	R	P	4,273,462	41,383	33%	1,410,243	13,656	
REDMOND	S	REDMOND SUBSTATION(BPA)	3	69	LN	P/NT/P	15,287,424	678,175	50%	7,643,712	339,088	67% PTP, 33% NT; Serves load and connects Pilot BT 230
REEDSPORT	S	REEDSPORT SUBSTATION (BPA)	6	115/12.47	R	NT	1,902,952	71,255	75%	1,427,214	53,441	

Substation	BPA #	Line / Utility / Equipment Code	Pg. #	R/OL /LN/		Investment \$	O&M \$	% Factor	Investment \$ w/ Factor	O&M \$ w/ Factor	Comment
				Voltage (kV)	LSN/ P/NT						
REEDSPORT	TL	TAHKENITCH-REEDSPORT #1	6	115	LN NT	389,270	65,020	100%	389,270	65,020	
REEDSPORT	TL	REEDSPORT-FAIRVIEW #1	6	115	LN NT	5,328,720	224,753	100%	5,328,720	224,753	
REPUBLIC	TL	COLVILLE-REPUBLIC NO 1	27	115	R NT	3,326,000	164,374	100%	3,326,000	164,374	
REPUBLIC	S	REPUBLIC SUBSTATION	27	115/34.5	R NT	512,562	23,477	100%	512,562	23,477	
RICHLAND	S	RICHLAND SUBSTATION	14	115	R NT	367,404	24,273	50%	183,702	12,136	
RICHLAND	TL	RICHLAND-STEVENS DRIVE	14	115	LN NT	51,835	72	100%	51,835	72	LN - 7MW from Stevens Drive, 48MW from Richland
RICHLAND	TL	RICHLAND-RED MOUNTAIN	14	115	LN NT	367,404	24,273	100%	367,404	24,273	
RICHLAND	TL	WHITE BLUFFS-RICHLAND NO 1	14	115	LSN NT	1,688,885	51,445	100%	1,688,885	51,445	
RINGOLD	S	RINGOLD SUBSTATION	14	115/13.8	R NT	--	--	100%	-	-	
ROE'S CORNER	E	(3) DS-G	1A	138	R NT	38,236	907	100%	38,236	907	
ROE'S CORNER	TL	TAP to HEYBURN-ADELAIDE	1A	138	R NT	1,116,651	18,865	100%	1,116,651	18,865	
ROGUE	TL	ROGUE-GOLD BEACH NO 1	6	115	R NT	2,572,328	13,827	100%	2,572,328	13,827	
ROGUE	TL	ROGUE-GOLD BEACH NO 2	6	115	R NT	4,805,288	148,207	100%	4,805,288	148,207	
ROSS	TL	ROSS-CARBORUNDUM NO 1	17	115	R P	104,720	13,558	100%	104,720	13,558	
ROSS	TL	ROSS-VANCOUVER SHIPYARD #1	17	115	R NT	361,029	12,339	100%	361,029	12,339	Powerflow shows Radial
ROSS	TL	ROSS-ARCHER (CPU)	17	115	R P	--	--	100%	-	-	
ROSS	TL	ROSS-STOCKFORD (CPU)	17	115	R P	--	--	100%	-	-	
ROSS	TL	ROSS-ALCOA #2 and #4	17	115	LN	136,560	8,999	100%	136,560	8,999	
ROUND VALLEY	S	ROUND VALLEY SUBSTATION	1	230/69	R NT	1,571,272	39,451	100%	1,571,272	39,451	
ROUNDUP	S	ROUNDUP SUBSTATION	2	69	LN P	5,356,636	195,004	50%	2,678,318	97,502	
ROZA P.H.	TL	ROZA P.H.-MOXEE	21	115	LN P	23,832	115,278	100%	23,832	115,278	
SACHEEN	TL	SACHEEN-ALBENI FALLS	26	115	LSN P	1,130,388	58,293	100%	1,130,388	58,293	
SALEM	S	SALEM SUBSTATION	8	230/115	LSN P	4,847,599	251,860	50%	2,423,800	125,930	
SALEM	TL	CHEMAWA-SALEM #2	8	115	LN NT	302,519	9,129	100%	302,519	9,129	
SALEM	TL	SALEM-ALBANY #1	8	115	LN P	1,279,628	103,416	100%	1,279,628	103,416	
SALEM	TL	SALEM-ALBANY #2	8	115	LN NT	1,234,113	186,150	100%	1,234,113	186,150	
SALEM ALUMINA	S	SALEM ALUMINA SUBSTATION(SALEM ELEC COOP)	8	115/12.5	R NT	18,224	1,098	100%	18,224	1,098	
SAMUELS	S	SAMUELS SUBSTATION	25	115	R NT	42,869	536	100%	42,869	536	
SAND CREEK	TL	BRONX-SAND CREEK NO 1	25	115	R P	2,558,215	13,681	100%	2,558,215	13,681	
SAND CREEK	TL	ALBENI FALLS-SAND CREEK #1	25	115	LSN NT	11,108,982	178,416	100%	11,108,982	178,416	
SAND CREEK	S	BPA-BRONX	25	115	LSN P	5,887,645	91,039	25%	1,471,911	22,760	Connection with Cab Gorg 230, Northern equip. not counted
SANDHILL CRANE	E	SAND HILL CRANE SUBSTATION	15	115	R NT	70,897	2,437	100%	70,897	2,437	
SANDPOINT	S	SANDPOINT SUBSTATION(BPA)	25	115/13.8	R NT	851,399	92,994	50%	425,699	46,497	
SAPPHO	TL	PORT ANGELES-SAPPHO NO 1	30	115	R NT	2,259,579	189,762	100%	2,259,579	189,762	
SAPPHO	S	SAPPHO SUBSTATION	30	115/69	R NT	1,579,420	66,909	100%	1,579,420	66,909	
SCOOTENEY	S	SCOOTENEY SUBSTATION	23	115/34.5	R NT	775,042	42,246	100%	775,042	42,246	
SCOOTENEY	TL	SCOOTENEY TAP TO MIDWAY-BENTON NO 1	23	115	OL NT	337,805	45,949	100%	337,805	45,949	
SELLE	S	SELLE SUBSTATION	25	115/13.8	R NT	--	--	100%	-	-	
SHELTON	TL	SHELTON-KITSAP #2	30	115	LSN NT	9,376,899	59,793	100%	9,376,899	59,793	
SHELTON	S	SHELTON SUBSTATION	30	115	R NT	27,020,426	240,301	5%	1,351,021	12,015	Benson Tap on Shelton-Kitsap #2 line
SIFTON	S	SIFTON SUBSTATION	17	115	LSN P	5,637,094	244,730	75%	4,227,821	183,547	
SIFTON	TL	SIFTON-FISHERS ROAD LINE 1	17	115	R P	55,704	1,360	100%	55,704	1,360	
SIFTON	TL	NORTH CAMAS-SIFTON #1	17	115	LN P	190,685	3,893	100%	190,685	3,893	
SIFTON	TL	SIFTON-ROSS #1	17	115	LN	226,144	6,586	100%	226,144	6,586	
SILVER BOW	S	SILVER BOW SUBSTATION	13	230/69	R NT	1,249,287	81,462	100%	1,249,287	81,462	12.87mi radial 230 KV
SILVER CREEK	S	SILVER CREEK SUBSTATION	20	230/69	LSN NT	2,084,546	137,919	50%	1,042,273	68,960	Interconnect generation/load
SMITHSON	S	SMITHSON SUBSTATION (KITITAS CO PUD)	21	115	R NT	29,513	0	100%	29,513	-	
SNIPES	S	SNIPES SUBSTATION	15	115/12.5	R NT	90,899	2,999	100%	90,899	2,999	
SNOHOMISH	S	SNOHOMISH SUBSTATION	29	230/115	LSN NT	37,865,335	1,662,589	30%	11,359,601	498,777	
SNOKING	S	SNO-KING SUBSTATION	29	230/115	LSN NT	34,407,361	665,847	30%	10,322,208	199,754	
SOUTH ELMA	TL	SOUTH ELMA-SATSOP PARK	19	115	LN NT	201,759	21,642	100%	201,759	21,642	
SOUTH FORK	S	SOUTH FORK SUBSTATION	7	115	R NT	49,334	1,785	100%	49,334	1,785	
SOUTH SUBSTATION	E	DS-G, ACG	7	115	R NT	1,349,264	67,309	100%	1,349,264	67,309	
SPAR CANYON	E	SPAR CANYON SUBSTATION	1	230	R NT	544,905	48,197	100%	544,905	48,197	BPA owned equipment in foreign boundary
SPAR CANYON	TL	SPAR CANYON - ROUND VALLEY NO.1	1	230	R NT	1,264,435	39,449	100%	1,264,435	39,449	
SPEARFISH	S	SPEARFISH SUBSTATION(KLICKITAT CO PUD)	15	115	R NT	35,741	1,348	100%	35,741	1,348	
SPEARFISH	TL	TAP TO CHENOWETH-GOLDENDALE #1	15	115	R NT	113,617	23,081	100%	113,617	23,081	
SPRING CREEK	S	SPRING CREEK SUBSTATION	15	230	N NT	9,530,317	65,426	0%	-	-	Tap - Switching Station; Interconnect generation
SPRINGHILL	S	SPRINGHILL SUBSTATION(IINLAND POWER & LIGHT)	27	115	R NT	23,544	221	100%	23,544	221	
ST. JOHNS	S	ST. JOHNS SUBSTATION	9	115/57/11	LSN P	7,165,499	498,351	50%	3,582,749	249,176	LSN also served by Knott 115kV substation
ST. JOHNS	TL	ST. HELLENS-ST. JOHNS	9	115	N NT	1,495,409	132,523	0%	-	-	

Substation	BPA #	Line / Utility / Equipment Code	Pg. #	Voltage (kV)	R/OL /LN/ LSN/		Investment \$	O&M \$	% Factor	Investment \$ w/ Factor	O&M \$ w/ Factor	Comment
					N	P/NT						
STATELINE	S	STATELINE SUBSTATION	12	69/12.5	R	NT	--	--	100%	-	-	
STATION X	E	(10) DS-G, (4) PCB	30	115	R	NT	NO DATA	NO DATA	100%	-	-	4 Breaker stations; No Data
STEILACOOM	S	STEILACOOM SUBSTATION	20	115/12.5	R	NT	--	--	100%	-	-	
STEVENSON	S	STEVENSON SUBSTATION	16	115	R	NT	25,896	3,921	100%	25,896	3,921	
SULLIVAN	S	SULLIVAN SUBSTATION(VERA WATER & POWER)	26	115	R	NT	5,684	221	100%	5,684	221	
SUMNER	S	SUMNER SUBSTATION	6	115	LSN	NT	22,970	2,939	100%	22,970	2,939	
SUN HARBOR	S	SUN HARBOR SUBSTATION	14	115/24.9	R	NT	--	--	100%	-	-	115kV tap to customers prior to Xformer
SUN HARBOR	TL	SACAJAWEA-SUN HARBOR NO 1	14	115	R	NT	31,818	8,418	100%	31,818	8,418	
SURPRISE LAKE	S	SURPRISE LAKE SUBSTATION	20	115/12.5	R	NT	--	--	100%	-	-	
SWAN VALLEY	S	BPA-LOWER VALLEY ENERGY	1	115/12.5	R	P	5,459,787	95,838	25%	1,364,947	23,960	
SWAN VALLEY	TL	SWAN VALLEY-GOSHEN #1	1	161	LN	NT	4,291,759	105,235	100%	4,291,759	105,235	
SWAN VALLEY	TL	SWAN VALLEY-TETON #1	1	115	LSN	P	2,751,164	87,452	100%	2,751,164	87,452	
SWAN VALLEY	TL	SWAN VALLEY-TETON #2	1	115	LSN	P	5,097,650	69,515	100%	5,097,650	69,515	
TACOMA	S	TACOMA SUBSTATION	20	230	N	P	17,011,984	693,122	0%	-	-	
TAHKENITCH	S	TAHKENITCH SUBSTATION	6	115	R	NT	5,768,586	108,603	50%	2,884,293	54,301	Serves 2 radial loads
TAPTEAL	S	TAPTEAL SUBSTATION	11	115	R	NT	92,685	705	100%	92,685	705	
TARGHEE	S	TARGHEE SUBSTATION	1	12.5	R	NT	1,463,461	129,287	100%	1,463,461	129,287	BPA owned/lease?
TARGHEE	S	TARGHEE TAP SWITCHING STATION	1	115	R	NT	317,710	3,657	100%	317,710	3,657	
TARGHEE	TL	TARGHEE-DRUMMOND	1	115	LN	P	79,148	223,641	100%	79,148	223,641	1MW flow out power flow
TARGHEE	TL	TARGHEE TAP TO SWAN VALLEY-TETON NO 1	1	115/12.5	R	NT	939,693	42,531	100%	939,693	42,531	Lines/Equip leased by BPA
TARGHEE	TL	TARGHEE-DRUMMOND # 1	1	115	LN	P	79,148	223,641	100%	79,148	223,641	
TARGHEE	TL	Targhee-Mack's Inn TL & Subs	1	115	R	NT	510,921	0	100%	510,921	-	
TAYLOR FLATS	S	TAYLOR FLATS SUBSTATION	14	115	R	NT	7,012	918	100%	7,012	918	
TETON	S	TETON SUBSTATION	1	115	LN	P	2,642,162	156,959	100%	2,642,162	156,959	Serves no load. Switching station.
THAYER DRIVE	S	THAYER DRIVE SUBSTATION(CITY OF RICHLAND)	14	115	R	NT	85,951	1,772	100%	85,951	1,772	
THE DALLES	S	THE DALLES SUBSTATION	16	115/12.5	R	NT	2,378,051	81,609	50%	1,189,025	40,804	
THE DALLES	TL	THE DALLES-CHENOWETH	16	115	LN	P	171,667	9,472	100%	171,667	9,472	
TILLAMOOK	S	TILLAMOOK SUBSTATION	7	115	R	NT	7,650,377	326,895	50%	3,825,189	163,448	One line and powerflow topology do not agree
TIMBER	S	TIMBER SUBSTATION	7	115/34.5	R	NT	595,129	51,367	100%	595,129	51,367	
TIMBER	TL	TIMBER TAP TO FOREST GROVE-TILLAMOOK NO 1	7	115	R	NT	489,012	124,626	100%	489,012	124,626	Timber Tap value included
TOLEDO	S	TOLEDO SUBSTATION	6	69	R	NT	12,085,853	244,448	50%	6,042,926	122,224	Serves 190 MWs of load
TONASKET	E	(2) DS-G	28	115	R	P	NO DATA	NO DATA	100%	-	-	
TRASK RIVER	TL	TILLAMOOK-TRASK RIVER NO 1	7	115	R	NT	1,817,433	82,727	100%	1,817,433	82,727	
TRENTWOOD	S	BPA-KAISER ALUMINUM & CHEMICAL CORP.	26	115/6.9	R	NT	3,377,453	80,575	50%	1,688,726	40,287	Feeders 1-6; Determined as Network and DSI
TRENTWOOD	TL	VERA TAP TO TRENTWOOD-VALLEY WAY NO 1	26	115	R	NT	221,647	23,426	100%	221,647	23,426	
TRENTWOOD	TL	TRENTWOOD - VALLEY WAY	26	115	R	P/NT	249,698	36,476	100%	249,698	36,476	50% PTP, 50% NT
TROUTDALE	E	TROUTDALE SUBSTATION(BPA)	9	115	N	NT	--	--	100%	-	-	
TROUTDALE	E	TROUTDALE SUBSTATION(PACIFICORP)	9	115	N	P	--	--	100%	-	-	
TROY	S	TROY SUBSTATION	25	115/13.8	R	NT	118,476	7,347	100%	118,476	7,347	
TUCANNON RIVER	S	TUCANNON RIVER SUBSTATION	13	115	N	NT	3,851,588	86,826	0%	-	-	No Load. Wind Generation?
TUCANNON RIVER	TL	WALLA WALLA-TUCANNON RIVER #1	13	115	LN	NT	2,087,969	89,495	100%	2,087,969	89,495	
TUMBLE CREEK	S	TUMBLE CREEK SUBSTATION	9	115/24.9	R	NT	--	--	100%	-	-	
TWO MILE ROAD	S	TWO MILE ROAD SUBSTATION	6	115/12.47	R	NT	--	--	100%	-	-	No integrated network facilities \$
UNDERWOOD	TL	UNDERWOOD TAP TO BALD MOUNTAIN-N. BONNEVILLE A	16	115	R	NT	657,771	1,489	100%	657,771	1,489	
UNITY	TL	UNITY-WEST BURLEY #1	1A	115	LSN	NT	1,921,580	77,457	100%	1,921,580	77,457	Not found in PowerFlow
UNITY	TL	UNITY-HEYBURN #1	1A	115	LSN	NT	528,636	37,191	100%	528,636	37,191	
UNITY	S	UNITY SUBSTATION(Idaho Power)	1A	138	R	NT	6,894	0	100%	6,894	-	
UNITY	S	UNITY SUBSTATION(BPA)	1A	138	R	NT	119,169	76,916	100%	119,169	76,916	
VALHALLA	S	VALHALLA SUBSTATION	21	115	R	NT	3,420,747	194,910	50%	1,710,374	97,455	Online and powerflow do not agree
VISTA	S	VISTA SUBSTATION	11	115	R	P	25,231	876	100%	25,231	876	
WAGNER LAKE	TL	WAGNER LAKE TAP TO WILBUR TAP	22	115	LN	P	441,963	82,877	100%	441,963	82,877	
WAGNER LAKE	TL	WAGNER LAKE-ODESSA	22	34.5	LN	NT	NO DATA	NO DATA	0%	-	-	
WAGNER LAKE	S	BPA-INLAND POWER	22	115/34.5	LN	NT	490,035	28,689	100%	490,035	28,689	
WALLA WALLA	TL	WALLA WALLA-PENDLETON #1	12	69	R	NT/P/NT	4,066,405	119,031	100%	4,066,405	119,031	33% PTP, 67% NT; Interconnect generation
WALLA WALLA	TL	WALLA WALLA-FREEWATER	12	69	OL	NT	1,331,932	13,569	100%	1,331,932	13,569	
WALLA WALLA	TL	FRANKLIN-WALLA WALLA #1	12	115	LSN	NT	6,092,479	55,606	100%	6,092,479	55,606	
WALNUT CITY	TL	WALNUT CITY TAP TO FOREST-GROVE-MCMINNVILLE NO :	7	115	R	NT	1,349,264	67,309	100%	1,349,264	67,309	
WALTON	S	WALTON SUBSTATION	5	115/12.5	R	NT	21,204	1,389	100%	21,204	1,389	
WARNER	S	BPA-PACIFICORP	3	230/115	LN	P	3,535,383	89,947	100%	3,535,383	89,947	
WARREN	S	WARREN SUBSTATION	8	115/34.5	R	NT	594,774	59,726	100%	594,774	59,726	
WENDSON	S	WENDSON SUBSTATION	6	115	R	NT	6,452,098	233,317	25%	1,613,024	58,329	

Substation	BPA #	Line / Utility / Equipment Code	Pg. #	Voltage (kV)	R/OL /LN/		Investment \$	O&M \$	% Factor	Investment \$ w/ Factor	O&M \$ w/ Factor	Comment
					N	P/NT						
WENDSON	TL	WENDSON-TAHKENITCH #1	6	115	LN	NT	3,471,053	102,074	100%	3,471,053	102,074	
WEST BURLEY	TL	UNITY-WEST BURLEY	1A	138	R	NT	1,921,580	77,457	100%	1,921,580	77,457	
WEST BURLEY	E	(2) LDS	1A	138	OL	NT	156,561	4,163	100%	156,561	4,163	N/O sw, open-loop
WEST BURLEY-HEYBURN	TL	WEST BURLEY-HEYBURN #1 TL	1A	138	LN	NT	21,218	30,658	100%	21,218	30,658	BPA O&M lease
WESTSIDE	S	WESTSIDE SUBSTATION(BPA)	1	161/46	R	NT	6,662,868	93,668	100%	6,662,868	93,668	Radial substation connected to 161 kV circuit to serve customer
WHITE BLUFFS	TL	WHITE BLUFFS-451B #1	15	115	LN	NT	1,025,555	5,431	100%	1,025,555	5,431	
WHITE BLUFFS	TL	WHITE BLUFFS-B3S4	14	115	N	NT			0%	-	-	
WHITE BLUFFS	TL	WHITE BLUFFS-DOE B3S4, BENTON-DOE B3-S4 NO 1	15	115	LSN	NT	720,376	31,972	100%	720,376	31,972	
WILLARD JOHNSON	TL	PACIFICORP POWERDALE TAP	16	69	R	P	NO DATA	NO DATA	100%	-	-	
WINE COUNTRY	S	WINE COUNTRY SUBSTATION	22	230	LSN	P	--	--	75%	-	-	LSN with Outlook 230
WINTHROP	S	BPA-OKANOGAN CO. ELECTRIC CO-OP	28	115/13.2	R	P	1,167,692	111,176	100%	1,167,692	111,176	
Woodland	S	WOODLAND SWITCHING STATION	17	115	R	NT	250,630	2,029	100%	250,630	2,029	Swift tap; Interconnect generation
WREN	S	WREN SUBSTATION	7	115/69	R	NT	1,279,628	103,416	100%	1,279,628	103,416	
YAAK	S	YAAK SUBSTATION	25	115/12.5	R	NT	--	--	100%	-	-	

TOTAL W/ %FACTOR	714,055,774	23,998,013
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