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Bonneville Power Administration  
Transmission Services

2014 BPA Plan



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# 2014 BPA Plan

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# 1 Introduction

## 1.1 Purpose

The purpose of this document is to provide a ten year plan for reinforcements to BPA's transmission system, hereafter called the **BPA Plan**. The BPA Plan provides a narrative description of the transmission needs identified through the transmission planning process, the preferred alternative, an estimated cost, and estimated schedule for completion of the preferred alternative. The BPA Plan also reflects any plans for facilities needed to provide requested interconnection or long-term firm transmission service on the Transmission Provider's system. This BPA Plan is provided in accordance with Attachment K of the Bonneville Power Administration Open Access Transmission Tariff (OATT).

## 1.2 Description of the BPA Transmission System

The role of BPA's Transmission Services is to provide reliable open access transmission service for customers, utilities, generators, and power marketers consistent with applicable regulatory and statutory requirements. Transmission Services also provides asset management services for BPA's transmission assets including transmission system planning, design, construction, operations and maintenance.

BPA operates and maintains about 75% of the high-voltage transmission network in its service territory. BPA's service territory is approximately 300,000 square miles and includes Idaho, Oregon, Washington, western Montana and small parts of eastern Montana, California, Nevada, Utah, and Wyoming. BPA's transmission system includes more than 15,000 circuit miles of transmission lines and over 260 substations. The transmission system serves many sectors of the Northwest including publicly owned and investor owned utilities, independent power producers and direct service industries.

## 1.3 Acronyms

AVA - Avista  
BCTC – British Columbia Transmission Corporation  
BPA – Bonneville Power Administration  
FCRPS – Federal Columbia River Power System  
FCRTS – Federal Columbia River Transmission System  
FERC – Federal Energy Regulatory Commission  
GI – Generator Interconnection  
HVDC – High Voltage Direct Current  
IPC – Idaho Power Company  
LADWP – Los Angeles Department of Water and Power  
LGI – Large Generator Interconnection  
LGIA – Large Generator Interconnection Agreement  
LLI – Line and/or Load Interconnection  
NEPA – National Environmental Policy Act  
NERC – North American Electric Reliability Corporation  
NOS – Network Open Season  
NWE – Northwestern Energy

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OATT – Open Access Transmission Tariff  
PAC - PacifiCorp  
PGE – Portland General Electric  
PSE – Puget Sound Energy  
PTC – Production Tax Credit  
RAS – Remedial Action Scheme  
RRO – Regional Reliability Organization  
SGI – Small Generator Interconnection  
SOB – South of Boundary  
TSR – Transmission Service Request  
UEC – Umatilla Electric Co-op  
USCE – U.S. Corps of Engineers  
USBRE – U.S. Bureau of Reclamation  
WECC – Western Electricity Coordinating Council  
WOH – West of Hatwai  
WOLM – West of Lower Monumental

## ***1.4 Standards and Requirements***

BPA is a member of the Western Electricity Coordinating Council (WECC). WECC is the Regional Reliability Organization (RRO) for the North American Electric Reliability Corporation (NERC). BPA Transmission Services applies the NERC/WECC Planning Standards to ensure reliability in planning the transmission system. Over the past several years, NERC has been revising the standards with the objective of making requirements clear and measurable. In many cases new requirements have been identified and some criteria are more stringent leading to new investments. Compliance with these standards is one of the driving factors behind capital investments on the transmission system.

## ***1.5 Objective***

The objective of the BPA Plan is to identify and describe reinforcement projects for the transmission system. The BPA Plan contains proposed projects identified to meet the forecast requirements of BPA and other customers over the 10-year planning horizon.

The Key Drivers for system expansion and reinforcement projects are described below.

## ***1.6 Key Drivers***

### **1.6.1 Reliability and Load Service**

BPA plans the transmission system to serve expected loads and load growth based on forecasts. The forecast peak loads, plus long-term firm transmission service obligations, are used to determine the bulk system reinforcement requirements. BPA plans the system in accordance with the NERC WECC Planning Standards to maintain transmission system reliability.

Within the BPA service area, load growth occurs at different rates depending on the specific geographic area. BPA has divided its service area into 24 load service areas grouped by either electrical or geographical proximity. In the BPA Plan, the load areas are listed roughly in order from largest to smallest, based on total estimated load served in each area.

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### **1.6.2 Transmission Service**

Qualified customers may request transmission service on BPA's transmission system. This service is requested through Transmission Service Requests (TSR) according to the terms of the BPA OATT. Transmission Service Requests are one of the drivers for system expansion projects.

### **1.6.3 Generator Interconnection Service**

Qualified customers may request interconnection to BPA's system for interconnecting new generation. BPA receives Generator Interconnection (GI) Requests according to the Attachment L (Large Generator Interconnection Process) and Attachment N (Small Generator Interconnection Process) of the BPA OATT. The Generator Interconnection projects listed in the BPA Plan include projects over 20 MW (Large Generator Projects) which have an executed Large Generator Interconnection Agreement (LGIA) or construction agreement.

### **1.6.4 Line and Load Interconnection Service**

Qualified customers may request new points of interconnection on BPA's transmission system. These Line or Load Interconnections (LLI) are typically for new load service or to allow the Customer to shift the delivery of service to different points on their system. This service is requested according to BPA's Line and Load Interconnection Procedures (version 2) Business Practice. Similar to the generator interconnection projects, only larger projects which have an executed interconnection or construction agreement are included in the BPA Plan.

## ***1.7 BPA Plan Organization***

The following sections of the BPA Plan describe the proposed new facilities organized by type of project. The types of projects include 1) Projects required to provide load service and meet Planning Reliability Standards, 2) Projects required to meet requests for transmission service, 3) Projects required to meet requests for Generator Interconnection service, and 4) Projects required to meet requests for Line and Load Interconnection service. Some projects may satisfy multiple criteria; however they will only be described once in the BPA Plan.

In addition to proposed projects, the 2014 BPA Plan includes a listing of "Recently Completed Projects" for each load area or path. This category includes projects which have been completed since the previous update to the BPA Plan (for 2013).

Where applicable, there is also a category called "Deferred Plans of Service". This consists of plans of service which have been mentioned in previous BPA Plans; however the present year's system assessment shows the need date has moved beyond the planning horizon. This is typically a result of reduced load growth resulting in changes to the load forecast for the particular area.

### **NOTES:**

- (1) Estimated Project Costs are "direct" costs (overheads are not included)
- (2) Where official cost estimates have not been developed, the indicated project cost reflects the best information available, based on typical costs of similar projects.

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## **2 Load Service Projects**

BPA's service territory is divided into 24 load service areas based on electrical or geographical proximity. The load areas range from major load centers such as Seattle-Tacoma and Portland, to smaller load areas like the DeMoss/Fossil load area. In the BPA Plan, the load areas are listed roughly in order from the largest to the smallest load.

### ***2.1 Seattle-Tacoma-Olympia Area***

#### **2.1.1 Description**

The Seattle-Tacoma-Olympia area includes a large portion of northwestern Washington. It is bordered on the north by Canada and on the south by Olympia. It is bordered on the east by the Cascade Mountains and on the west by the Puget Sound. It includes Whatcom, Skagit, Snohomish, King, Pierce, Thurston, and north Lewis counties. It includes the greater Seattle area including Bellevue and Everett. To the north of the Seattle metropolitan area includes Blaine, Bellingham, Sedro Woolley and Mount Vernon and to the south the Seattle metropolitan area includes Puyallup and Olympia.

The customers in this area include:

- Whatcom County PUD (WPUD)
- Puget Sound Energy (PSE)
- Seattle City Light (SCL)
- Snohomish County PUD (SPUD)
- Tacoma Power Utilities (TPU)
- Alder Mutual Light Co. (Mutual)
- City of Eatonville (Mutual)
- City of Milton (Mutual)
- City of Steilacoom (Mutual)
- Elmhurst Light and Power (Mutual)
- Lakeview Light and Power (Mutual)
- Ohop Mutual Light (Mutual)
- Parkland Light and Power (Mutual)
- Peninsula Light (Mutual)

The load area is served by the following major transmission paths or lines.

- From the north by the Northwest-British Columbia path (or Northern Intertie),
- From the east by the West of Cascades North (WOCN) path,
- From the south by the Raver-Paul path, and
- From the west by the Satsop-Olympia 230 kV and Satsop-Paul 500 kV lines

#### **2.1.2 Local Generation and Load**

The Seattle/Bellingham area has over 2500 MW of local generation which consists primarily of hydro and thermal (coal and gas-fired) generators. The Tacoma/Olympia area has approximately 750 MW of local generation. The local generation includes:

<b>Seattle/Bellingham Sub-Area</b>	<b>Max. MW</b>	<b>Owner</b>
<b>PSA Generators</b>		
Enserch	185	PSE
Fredonia	320	PSE
Sawmill (Fredonia)	33	PSE
Komo (Baker)	13	PSE
Lower Baker	85	PSE
Upper Baker	105	PSE
March Point (Texaco)	150	PSE
Ferndale	280	PSE
Sumas	140	PSE
Whitehorn	180	PSE
Diablo	170	SCL
Gorge	180	SCL
Ross	450	SCL
Jackson	120	SNPD
<b>Other Generators</b>		
Cedar Falls	30	SCL
Tolt River	17	PSE
Twin Falls	25	PSE
Snoqualmie Falls	54	PSE
<b>TOTAL</b>	<b>2,537</b>	

<b>Tacoma/Olympia Sub-Area</b>	<b>Max. MW</b>	<b>Owner</b>
Alder	50	TPWR
Frederickson, LLP (230 kV)	270	BPA/PSE
Frederickson, PSE (115 kV)	160	PSE
Cushman	145	TPWR
LaGrande	69	TPWR
Simpson	64	TPWR
<b>TOTAL</b>	<b>758</b>	

The Seattle/Tacoma area load forecast is:

<b>Utility</b>	<b>2019 Summer</b>	<b>2024 Summer</b>	<b>2018/19 Winter</b>	<b>2023/24 Winter</b>
Seattle/Bellingham (MW)	5,369	5,739	7,353	7,758
Tacoma/Olympia (MW)	1,887	1,990	2,851	2,931
Total (MW)	7,256	7,729	10,204	10,689

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## 2.1.3 Proposed Plans of Service

### Tacoma 230 kV Series Bus Sectionalizing Breaker

- Description: This project adds a 230 kV series bus sectionalizing breaker at Tacoma Substation.
- Purpose: This project mitigates a 230 kV bus sectionalizing breaker at Tacoma Substation.
- Estimated Cost: \$ 1,500,000
- Energization: 2015

### Tacoma 230 kV Bus Tie Breaker

- Description: This project adds a 230 kV 230 kV bus tie breaker, and a 230 kV auxiliary bus sectionalizing disconnect switch at Tacoma Substation.
- Purpose: This project improves Operations and Maintenance (O&M) flexibility at Tacoma Substation.
- Estimated Cost: \$ 1,500,000
- Energization: 2015

### Silver Creek Substation Reinforcements

- Description: This project adds a 230 kV breaker at to separate the east and west 230 kV busses and adds a 69 kV circuit breakers on the low side of the 230/69 kV transformer.
- Purpose: This project increases the reliability and facilitates maintenance of the station since now, a fault on the 230 kV bus drops both 230/69 kV transformer banks.
- Estimated Cost: \$ 2,400,000
- Energization: 2015

### Paul 500 kV Shunt Reactor Addition

- Description: This project adds a shunt reactor (180 MVAR at 550 kV) at Paul Substation.
- Purpose: This project is required to maintain voltage schedules in the Puget Sound area during light load conditions.
- Estimated Cost: \$6,000,000
- Energization: 2016

### Raver 500/230 kV Transformer

- Description: This project adds a 1300 MVA, 500/230 kV transformer at Raver Substation. This project is part of the overall Puget Sound Area/Northern Intertie (PSANI) Regional Reinforcement Plan. This is a joint project between participating utilities in the Puget Sound area.
- Purpose: This project is required to support load growth in the Puget Sound area.
- Estimated Cost: \$45,000,000
- Energization: 2017

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### Maple Valley 230 kV Series Bus Sectionalizing Breaker

- Description: This project adds a 230 kV series bus sectionalizing breaker at Maple Valley Substation.
- Purpose: This project mitigates a potential failure of the existing 230 kV bus sectionalizing breaker at Maple Valley Substation.
- Estimated Cost: \$ 2,000,000
- Energization: 2024

## **2.1.4 Recently Completed Plans of Service**

### Monroe 500 kV Shunt Capacitor Addition

- Description: This project adds a 500 kV shunt capacitor group (316 MVAR) at Monroe Substation.
- Purpose: This project is required to provide voltage support in the Puget Sound area.
- Estimated Cost: \$5,600,000
- Energization: 2014

## **2.1.5 Deferred Plans of Service**

### Monroe 500 kV Shunt Reactor Addition

- Description: This project adds a 500 kV shunt reactor (300 MVAR) at Monroe Substation.
- Purpose: This project is required to maintain voltage schedules in the Puget Sound area.
- Estimated Cost: \$9,400,000
- Energization: This project has been cancelled.

## **2.2 Portland Area**

### **2.2.1 Description**

The Portland load service area includes the greater Portland metropolitan area in Oregon and the surrounding communities of Troutdale, Gresham, Sandy, Beaverton, Hillsboro, Tigard, Tualatin and Wilsonville, Oregon. This area includes Multnomah, Washington, northeast Clackamas, and south Columbia counties.

The customers in this area include:

- Portland General Electric (PGE)
- PacifiCorp (PAC)
- City of Forest Grove
- Western Oregon Electric Coop.
- Columbia River PUD
- McMinnville Water and Light

The load area is served by the following major transmission paths or lines.

- From the north by the Paul-Allston path,
- From the south by the Pearl-Ostrander and Pearl-Marion 500 kV lines,
- From the east by the West of Cascades South (WOCS) path

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## 2.2.2 Local Generation and Load

The Portland area has approximately 700 MW of local generation, including:

- Beaver C.T. Generation (PGE) 495 MW
- Bull Run Hydro #1 (PGE) 21 MW
- Bull Run Hydro #2 (City of Portland) 33 MW
- Faraday Hydro (PGE) 33 MW
- North Folk Hydro (PGE) 38 MW
- Oak Grove Hydro (PGE) 50 MW
- River Mill Hydro (PGE) 19 MW
- Sullivan Hydro (PGE) 15 MW

The Portland load service area is both summer and winter peaking with high levels of residential, commercial, and industrial loads. The peak summer loads are due to high levels of air conditioning load. The peak winter loads are due to high levels of base board electric heating load. The Portland area load forecast is:

Utility	2019 Summer	2024 Summer	2018/19 Winter	2023/24 Winter
Portland General Electric (MW)	3824	4131	4180	4455
PacifiCorp Portland (MW)	458	480	494	521
City of Forest Grove (MW)	51	52	57	58
City of McMinnville (MW)	174	186	203	214
Clatskanie PUD (MW)	115	120	129	135
Columbia River PUD (MW)	82	85	103	107
<b>Total (MW)</b>	<b>4704</b>	<b>5054</b>	<b>5166</b>	<b>5490</b>

## 2.2.3 Proposed Plans of Service

### Pearl 500 kV Upgrades

- Description: This project adds a 500 kV circuit breaker at Pearl Substation and re-terminates the Pearl 500/230 kV transformer No.2 into the new bay position.
- Purpose: This project will improve system reliability for the South of Allston path.
- Estimated Cost: \$2,100,000
- Energization: 2016

### Keeler 500 kV 500/230 kV transformer re-termination

- Description: This re-terminates the Keeler 500/230 kV transformer from the west bus to the east bus.
- Purpose: This project will better balance the loads on the Keeler 230 kV bus.
- Estimated Cost: \$2,000,000
- Energization: 2018

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### Troutdale 230 kV Bus Sectionalizing Breaker Addition

- Description: This project adds a series 230 kV bus sectionalizing breaker at Troutdale Substation.
- Purpose: This project is required to maintain reliable load service to the Portland area.
- Estimated Cost: \$2,000,000
- Energization: 2018

### I-5 Corridor Reinforcement Project

- Description: This proposed project includes a new 500 kV transmission line (approximately 70 miles) between a new substation in the vicinity of Castle Rock, Washington and a new substation in Troutdale, Oregon.
- Purpose: This project addresses the issue of providing reliable service to loads in southwest Washington and northwest Oregon. This project also meets the FERC Open Access requirements by building the necessary transmission facilities to accommodate requests for firm transmission service across BPA's network. This project was identified in the 2008 Network Open Season.
- Estimated Cost: \$459,000,000
- Energization: This current project schedule is 2018. The project is currently going through the environmental review (NEPA) process. The final environmental Impact Statement (EIS) is expected to be released in late 2015, followed by a Record of Decision (ROD) in 2016. If BPA decides to build the project, the schedule will be re-evaluated.

### Carlton Upgrades

- Description: This project adds four additional circuit breakers at Carlton substation: two each at the 115 and 230 kV buses. Additionally, the Forest Grove–McMinnville 115kV line will be looped into the Carlton 115 kV bus, creating the Forest Grove–Carlton and Carlton–McMinnville 115kV lines.
- Purpose: This project improves Operations and Maintenance (O&M) flexibility.
- Estimated Cost: 3,600,000
- Energization: 2016

## **2.2.4 Recently Completed Plans of Service**

### Keeler 230 kV Bus Sectionalizing Breaker Addition

- Description: This project adds a 230 kV bus sectionalizing breaker at Keeler Substation.
- Purpose: This project is required to maintain reliable load service to the Portland area.
- Estimated Cost: \$3,900,000
- Energization: 2014

### Ostrander 500 kV Breaker Addition

- Description: This project adds a new 500 kV circuit breaker at Ostrander Substation.
- Purpose: This project will improve system reliability and load service to the Portland area.
- Estimated Cost: \$2,400,000
- Energization: 2014

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## 2.2.5 Deferred Plans of Service

### Split Pearl-Sherwood 230 kV Lines and Re-terminate

- Description: This project splits the double circuit Pearl-Sherwood 230 kV #1 and #2 lines into separate circuits and develops the necessary 230 kV bay positions at Pearl and Sherwood.
- Purpose: This project is required to maintain reliable load service to the Portland area.
- Estimated Cost: \$1,500,000
- Energization: Beyond the planning horizon.

### Split McLoughlin-Pearl-Sherwood 230 kV Lines and Re-terminate

- Description: This project splits the double circuit portion of the McLoughlin-Pearl-Sherwood 230 kV line into separate circuits and develops the necessary 230 kV bay positions at Pearl and Sherwood.
- Purpose: This project is required to maintain reliable load service to the Portland area.
- Estimated Cost: \$1,500,000
- Energization: Beyond the planning horizon.

### Pearl 230 kV Bus Sectionalizing Breaker Addition

- Description: This project adds a 230 kV bus sectionalizing breaker at Pearl Substation.
- Purpose: This project is required to provide reliable load service to the Portland area.
- Estimated Cost: \$2,000,000
- Energization: Beyond the planning horizon.

## 2.3 Vancouver Area

### 2.3.1 Description

The Vancouver area is located in southwestern Washington State and encompasses Clark County. This area extends north to the Longview area and east to the Cascade Mountain Range. It is bordered on the south and west by the Columbia River. This includes the greater Vancouver, Washington area and the communities of Washougal, Camas, Ridgefield, and Battleground.

The customers in this area include:

- Clark PUD

The lines serving the area include:

- North Bonneville-Ross 230-kV #1 (BPA)
- North Bonneville-Ross 230-kV #2 (BPA)
- McNary-Ross 345-kV (BPA)
- Longview-Lexington-Ross 230-kV (BPA)
- Bonneville-Alcoa 115 kV (BPA)
- Bonneville-Sifton-Ross 115-kV (BPA)
- PacifiCorp's Merwin-Cherry Grove-Hazel Dell-St Johns 115-kV (PacifiCorp)
- PacifiCorp/Clark's Troutdale-Runyan-Sifton 115-kV (PacifiCorp)

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### 2.3.2 Local Generation and Load

The local generation that supports the area load includes:

- River Road (Clark PUD) (250 MW)
- Swift (PacifiCorp and Cowlitz)(280 MW)
- Merwin and Yale (PacifiCorp) (235 MW)
- Bonneville PH #1 115-kV Units 200 MW
- Bonneville PH #1 230-kV Units 290 MW
- Bonneville PH #2 230-kV Units 560 MW

The Vancouver area load forecast is:

Area	2019 Summer	2018/19 Winter	2024 Summer	2023/24 Winter
Vancouver Area (Clark PUD) (MW)	748	988	781	1021

### 2.3.3 Proposed Plans of Service

#### North Bonneville-Troutdale 230 kV No.2 Line Re-termination

- Description: This project re-terminates the North Bonneville-Troutdale 230 kV line No.2 to the east bus section at North Bonneville Substation.
- Purpose: This project is required to support load service to the Vancouver area.
- Estimated Cost: \$2,000,000
- Energization: 2015

#### Sifton Substation Upgrade

- Description: - This project will add three 230 kV breakers and associated disconnect switches at Sifton Substation.
- Purpose: This project will improve Operations and Maintenance (O&M) flexibility.
- Estimated Cost: \$ 3,000,000
- Energization: 2016

### 2.3.4 Recently Completed Plans of Service

None since the previous planning cycle.

## 2.4 Salem/Albany Area

### 2.4.1 Description

The Salem/Albany area is located in northwestern Oregon in the northern Willamette Valley. It is bordered on the north by the Portland load area and on the south by the Eugene load area. It is bordered by the Willamette National Forest to the east and by the central Oregon Coast Range to the west. It includes Polk, Benton, Marion and Linn counties.

The major population areas include Salem, Albany, and Corvallis. Smaller communities include Dallas, Monmouth, Independence, Silverton, Stayton, and Lebanon.

The customers in this area include:

- Portland General Electric (Salem Area)
- PacifiCorp (Albany, Corvallis, Lebanon Area)
- City of Monmouth
- U.S. Bureau of Mines located in Albany, OR
- Several Electric Cooperatives: Western Oregon, Salem Electric, and Consumers Power (serving rural areas)

The load area is served by the following major transmission paths or lines.

- From the east by the West of Cascades South (WOCS) path and the Big Eddy-Chemawa 230 kV line, and the Marion-Alvey 500 kV.
- From the north by the (PGE) McLoughlin-Bethel 230 kV line, and the Pearl-Marion 500 kV No.1 line.
- From the south by the Alvey-Marion and Lane-Marion 500 kV lines.

### 2.4.2 Local Generation and Load

The local generation is mostly hydroelectric generation on the north and south forks of the Santiam River.

- Foster Dam (22 MW) owned by US Army Corp
- Green Peter Dam ((92 MW owned by US Army Corp
- Detroit Dam (120 MW) owned by US Army Corp
- Big Cliff Dam (22 MW)
- Adair generation (5.6 MW) owned by Consumers Power

The Salem/Albany area load forecast is:

Area	2019 Summer	2018/19 Winter	2024 Summer	2023/24 Winter
Salem/Albany (MW)	924	1,063	966	1,142

### 2.4.3 Proposed Plans of Service

#### Upgrade Salem-Albany No.1 and No. 2 115 kV lines

- Description: These 115 kV lines will be rebuilt with larger conductor as part of BPA’s wood pole replacement program.
- Purpose: The system assessment did not show a need for the line upgrades within the 10-year planning horizon, but it will eventually be needed to maintain load service to the area. It is more efficient to complete the line upgrades at the same time as the wood pole replacement project.
- Estimated Cost: Included as part of the wood pole replacement program.
- Energization: 2015 (No.2 line) 2016 (No.1 line)

#### Santiam-Chemawa 230 kV Line Upgrade

- Description: This project upgrades the Santiam-Chemawa 230 kV line to 100 degrees C maximum operating temperature.
- Purpose: The system assessment showed a need for the line upgrade potentially beyond the 10-year planning horizon, but it will eventually be needed to maintain load service to

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the area. It is more efficient to complete the line upgrade at the same time as the steel pole replacement project for this line.

- Estimated Cost: Included as part of the steel pole replacement program.
- Energization: 2016

#### **2.4.4 Recently Completed Plans of Service**

None since the previous planning cycle.

### **2.5 Eugene Area**

#### **2.5.1 Description**

This load area includes the western Central Willamette Valley in Oregon. It includes Polk, Benton, and Linn counties. It is bounded by Willamette National Forest on the east and the coast range on the west. It is bounded by the Salem/Albany load area to the north and PacifiCorp's load area south of Eugene. The major population areas include Eugene, Springfield, and Corvallis, and the communities of Harrisburg, Cottage Grove, and Drain.

The customers in this area include:

- PacifiCorp
- Eugene Water and Electric Board (EWEB)
- Emerald PUD
- Several Electric Cooperatives: Blachley-Lane, Lane Electric, Douglas Electric, Coos-Curry, and Consumers Power (serving rural areas)

The load area is served by the following major transmission paths or lines.

- From the east by the West of Cascades South (WOCS) path and the Big Eddy-Chemawa 230 kV line, and the Marion-Alvey 500 kV.
- From the south by the (PAC) Alvey-Dixonville 500 kV line.

#### **2.5.2 Local Generation and Load**

The local generation in this area includes hydroelectric generation on the McKenzie River and other generation as follows:

- Carmen generation owned by EWEB for a total of 94.5 MW maximum
- Cougar generation owned by US Army Corp for a total of 28 MW maximum
- Weyco generation owned by EWEB for a total of 47 MW maximum
- Leaburgs generation owned by EWEB for a total of 13.8 MW Maximum
- Stone Creek generation owned by EWEB for a total of 12.5 MW maximum
- Waltville generation owned by EWEB for a total of 9.7 MW maximum
- Hills Creek Green generation owned by US Army Corp for a total of 34 MW maximum.

Loads in this area are primarily residential and commercial, with a smaller industrial component.

The Eugene area load forecast is:

Area	2019 Summer	2018/19 Winter	2024 Summer	2023/24 Winter
EWEB (MW)	476	608	481	612
Blachley-Lane (MW)	35	56	32	41
Consumers Power, Inc. (MW)	10	14	11	14
Emerald PUD (MW)	30	36	25	38
Lane Electric Co-op (MW)	24	46	21	48
Springfield Utility Board (MW)	112	168	113	175
<b>Eugene Area Total (MW)</b>	<b>687</b>	<b>928</b>	<b>683</b>	<b>928</b>

### 2.5.3 Proposed Plans of Service

#### Alvey 500 kV Shunt Reactor Addition

- Description: This project will add a new 500 kV Shunt Reactor (180 MVAR) at Alvey Substation.
- Purpose: This project is required to maintain voltage schedules during light load conditions in the Eugene area.
- Estimated Cost: \$11,200,000
- Energization: 2015

#### Alvey 115 kV Bus Sectionalizing Breaker

- Description: This project will add a 115 kV bus sectionalizing breaker at Alvey Substation.
- Purpose: This project will improve Operations and Maintenance (O&M) flexibility.
- Estimated Cost: \$1,500,000
- Energization: 2016

#### Lane 230 kV Bus Sectionalizing Breaker

- Description: This project will add a 230 kV bus sectionalizing breaker at Lane Substation.
- Purpose: This project is required to maintain reliable load service for the Eugene area.
- Estimated Cost: \$2,000,000
- Energization: 2017

### 2.5.4 Recently Completed Plans of Service

None since the previous planning cycle.

## 2.6 *Olympic Peninsula Area*

### 2.6.1 Description

The Olympic Peninsula in Washington State is a long radial system extending about 110 miles from BPA's Olympia Substation northwest to BPA's Port Angeles substation. This area includes the Olympic Peninsula north and west of Olympia. Included within this area are Clallam, Mason, Kitsap and the western portion of Jefferson counties. The primary communities served

include Shelton, Bremerton, and Port Angeles, as well as the US Navy in the Bremerton area. The smaller communities include Potlatch, Hoodspport, Quilcene, Fairmount, Duckabush, and Sequim.

The customers in this area include:

- Puget Sound Energy (PSE)
- City of Port Angeles (CPA)
- Clallam County PUD
- Mason PUD#1
- Mason PUD #3
- US Navy (USN)

The load area is served by the following major transmission paths or lines.

- Satsop-Shelton 230 kV line
- three Olympia-Shelton 230 kV lines
- two Olympia-Shelton 115 kV lines.

### 2.6.2 Local Generation and Load

There is no generation connected directly to the load area, although there is some generation at Mason that serves the Tacoma area and the Grays Harbor plant located south of the load area.

The Olympic Peninsula area load forecast is:

Area	2019 Summer	2018/19 Winter	2024 Summer	2023/24 Winter
Olympic Peninsula (MW)	830	1247	850	1284
Kitsap Peninsula (MW)	449	695	503	720
North of Shelton (MW)	290	451	332	460

### 2.6.3 Proposed Plans of Service

#### Sappho 69 kV Shunt Capacitor Addition

- Description: This project adds 69 kV shunt capacitors (9.6 MVAR) at Sappho Substation.
- Purpose: This project is required to maintain reliable load service to the Port Angeles area.
- Estimated Cost: \$820,000
- Energization: 2017

#### Kitsap 115 Shunt Capacitor Modification

- Description: This project moves one group of 115 kV shunt capacitors from the south bus to the north bus at Kitsap substation.
- Purpose: This project is required to maintain voltage schedules on the Kitsap Peninsula transmission system.
- Estimated Cost: \$700,000
- Energization: 2017

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## 2.6.4 Recently Completed Plans of Service

None since the previous planning cycle.

## 2.7 *Tri-Cities Area*

### 2.7.1 Description

The Tri-Cities area is in South Central Washington and includes the three major communities of Pasco, Kennewick and Richland. This load area includes the irrigation loads of Big Bend Electric, Benton PUD, and Benton REA and many other communities near the Tri-Cities area such as West Richland and Benton City.

The customers in this area include:

- Franklin County PUD
- City of Richland
- Benton County PUD
- Benton REA
- Big Bend Electric Coop
- Columbia REA
- South Columbia Basin Irrigation District (generation and load)
- U.S. Bureau of Reclamation (load and generation)

The load area is served by the following major transmission paths or lines.

- From the east by the Lower Monumental-McNary 500 kV line which is tapped at Sacajawea with a 500/115 kV transformer,
- From the north by the Midway-Benton 230 kV line and the Midway-White Bluffs 230 kV line,
- From the south by the McNary-Franklin 230 kV line.

### 2.7.2 Local Generation and Load

The local generation is mostly hydroelectric generation. The Columbia Generating Station (1100 MW) is physically located in the Tri-Cities area, but not electrically. Therefore it was not considered part of the local generation.

- USCOE Ice Harbor hydro (700 MW)
- USBR Chandler hydro (12 MW)
- USCOE McNary hydro (1200 MW)
- South Columbia Basin Irrigation District hydro (Scootney, Glade & Ringold) (6 MW)
- Florida Power Nine Mile Wind (100 MW)
- Energy NW Nine Canyon Wind (90 MW)

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The Tri-Cities area load forecast is:

Area	2019 Summer	2018/19 Winter	2024 Summer	2023/24 Winter
Tri-Cities Area (MW)	1298	1134	1460	1205

### **2.7.3 Proposed Plans of Service**

#### Badger Canyon 115 kV Bus Tie addition

- Description: This project will add a 115 kV bus tie breaker at Badger Canyon Substation.
- Purpose: This project will improve Operations and Maintenance (O&M) flexibility.
- Estimated Cost: \$650,000
- Energization: 2016

#### Grandview 115 kV Bus Tie addition

- Description: This project will add a 115 kV bus tie breaker at Grandview Substation.
- Purpose: This project will improve Operations and Maintenance (O&M) flexibility.
- Estimated Cost: \$650,000
- Energization: 2016

#### Midway-Grandview 115 kV line upgrade

- Description: Rebuild the 9 mile Midway – Blackrock 115 kV line section by summer 2016, and rebuild the 16 mile Blackrock – Grandview 115 kV line section by summer 2017.
- Purpose: This project is needed to provide adequate load service to the Tri-Cities area.
- Estimated Cost: \$12,500,000
- Energization: 2016/17

#### McNary 500/230 kV Transformer No.2

- Description: This project has two parts. The first part adds a 500/230 kV transformer (1428 MVA) at McNary Substation. The second part adds current limiting reactors (5 ohms) in series with the 230 kV bus sectionalizing breaker between bus sections one and two at McNary.
- Purpose: This project is required to reliably integrate generation in the McNary area.
- Estimated Cost: \$20,400,000
- Energization: 2017

#### Jones Canyon 230 kV Shunt Reactor Addition

- Description: This project adds a 230 kV shunt reactor (40 MVAR) at Jones Canyon Substation.
- Purpose: This project is required to maintain voltage schedules in the area during light load conditions.
- Estimated Cost: \$2,000,000
- Energization: 2017

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## 2.7.4 Recently Completed Plans of Service

### Franklin 115 kV Shunt Capacitor Addition

- Description: This project adds 115 kV shunt capacitors (2 groups of 52 MVAR each) at Franklin Substation.
- Purpose: This project is required to support voltages and maintain reliable load service to the Tri-cities area.
- Estimated Cost: \$3,500,000
- Energization: 2014

### McNary 230 kV Shunt Capacitor Addition

- Description: This project adds 230 kV shunt capacitors (2 groups of 150 MVAR) at McNary Substation.
- Purpose: This project is required to provide dynamic reactive margin at the McNary Powerhouse.
- Estimated Cost: \$5,700,000
- Energization: 2014

## 2.8 Longview Area

### 2.8.1 Description

This area includes Cowlitz County in Washington State. The major population areas include Longview, Washington as well as the communities of Kelso, Kalama, Castle Rock, and Woodland, Washington.

The customers in this area include:

- Cowlitz PUD

The load area is served by the following major transmission paths or lines.

- Longview-Allston 230 kV #1
- Longview-Allston 230 kV #2
- Longview-Allston 230 kV #3
- Longview-Allston 115 kV #4
- The Chehalis-Longview 230 kV #1 and #2 lines.
- Ross-Lexington 230 kV line
- Merwin-Cardwell 115 kV line

### 2.8.2 Local Generation and Load

The local generation that supports the area load includes:

- Mintfarm (270 MW)
- Swift (PacifiCorp and Cowlitz)(280 MW)
- Merwin and Yale (PacifiCorp) (235 MW)
- Weyerhaeuser Company Generation (80MW)
- Cowlitz (Longview Fiber Co-gen) (55MW)

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The Longview area load forecast is:

Area	2019 Summer	2018/19 Winter	2024 Summer	2023/24 Winter
Longview Area (Cowlitz PUD) (MW)	643	947	667	969

### **2.8.3 Proposed Plans of Service**

#### Longview-Lexington 230 kV Line Re-termination

- Description: This project re-terminates the Longview-Lexington 230 kV line into the Longview 230 kV Annex Substation.
- Purpose: This project is required to maintain reliable load service to the Longview area.
- Estimated Cost: \$900,000
- Energization: 2015

#### Lexington 230 kV Bus Tie Breaker

- Description: This project adds a 230 kV bus tie breaker at Lexington Substation.
- Purpose: This project will improve Operations and Maintenance (O&M) flexibility.
- Estimated Cost: \$800,000
- Energization: 2015

#### Longview Area 230/115 kV Transformer Addition

- Description: – Add a 230/115 kV transformer in the Longview area. It may be possible to accomplish this by re-strapping an existing 230/69 kV transformer bank to 230/115 kV operation.
- Purpose: This project is required to maintain reliable load service to the Longview area.
- Estimated Cost: A cost estimate will be completed when the final plan of service is developed.
- Energization: 2021

### **2.8.4 Recently Completed Plans of Service**

None since the previous planning cycle.

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## 2.9 *Mid-Columbia Area*

### 2.9.1 Description

The Mid-Columbia (Mid-C) area includes the Columbia Basin area of central Washington, excluding the Tri-cities area, which is considered a separate load area. The Mid-C area extends from Moses Lake in Grant county, east to Leavenworth in Chelan county, Ellensburg in Kittitas county and Yakima in Yakima county to the west. It extends from Chelan to the north to Sunnyside in the south.

The customers in this area include:

- Chelan County PUD (Chelan)
- Douglas County PUD (Douglas)
- Kittitas County PUD (Kittitas)
- City of Ellensburg
- Benton REA (BREA)
- PacifiCorp (PAC)
- Benton County PUD (BPUD)
- Grant County PUD (Grant)

The load area is served by the following major transmission paths or lines.

- From the east by two Grand Coulee-Columbia 230 kV lines, a Grand Coulee-Rocky Ford 230 kV line and a Grand Coulee-Midway 230 kV line,
- From the south by the Midway-Big Eddy and the Midway-North Bonneville 230 kV lines.

### 2.9.2 Local Generation and Load

The local generation that supports the area load includes three classes:

**Hydroelectric generation** - There are 5 major hydroelectric plants on the Columbia River, including:

- Wells Dam (Douglas PUD) (840 MW)
- Rocky Reach Dam (Chelan County PUD) (1287 MW)
- Rock Island Dam (Chelan County PUD) (660 MW)
- Wanapum Dam (Chelan County PUD) (1038 MW)
- Priest Rapids Dam (Grant County PUD) (955 MW)

**Wind generation** - There are 2 wind farms; these include:

- Wild Horse (PSE) (273 MW)
- Kittitas Valley Wind (Horizon) (101 MW)

**Other Generation** - The other local generation includes:

- Roza Power Plant Yakima Project (USBR) (13 MW)
- Quincy Chute Hydroelectric (Grant) (9.4 MW)
- Potholes East Canal (Grant) (6.5 MW)
- Chelan Falls Hydroelectric Project (Chelan PUD) (59 MW)
- Summer Falls Power Plant (92 MW)

The Mid-Columbia area load forecast is:

Area	2019 Summer	2018/19 Winter	2024 Summer	2023/24 Winter
Douglas & Chelan Load Area (MW)	613	957	652	1032
Grant Load Area (MW)	963	994	1014	1085
Yakima Load Area (MW)	652	784	684	919
Ellensburg Load Area (MW)	52	61	56	68
<b>Mid-Columbia Load Area Total (MW)</b>	<b>2280</b>	<b>2796</b>	<b>2406</b>	<b>3104</b>

### 2.9.3 Proposed Plans of Service

#### Columbia 230 kV Bus Tie and Bus Sectionalizing Breaker Addition

- Description: This project adds a new 230 kV bus tie breaker and 230 kV bus sectionalizing breaker at Columbia Substation.
- Purpose: This project will improve operational and maintenance flexibility at Columbia Substation
- Estimated Cost: \$2,100,000
- Energization: 2015

#### Moxee 115 kV Bus Tie Breaker Addition

- Description: This project will add a 115 kV bus tie breaker at Moxee Substation.
- Purpose: This project will improve operational and maintenance flexibility.
- Estimated Cost: \$1,200,000
- Energization: 2016

#### Northern Mid-Columbia Area Project

- Description: This is a joint project between BPA, Grant PUD, Douglas PUD, and Chelan PUD. This project will result in a new Columbia-Rapids 230 kV line.
- Purpose: This project is required to maintain reliable load service to the Northern Mid-Columbia area.
- Estimated Cost: \$5,900,000 (the estimated cost is BPA's share of the total project cost).
- Energization: 2016 (the date is contingent on agreements with participants).

### 2.9.4 Recently Completed Plans of Service

None since the previous planning cycle.

## 2.10 Central Oregon/Alturas (aka Northern California) Areas

### 2.10.1 Description

#### Central Oregon:

The Central Oregon area includes the communities of Madras to the north, the cities of Redmond and Bend, Prineville to the east and La Pine and Sun River to the south. It includes Jefferson and Deschutes counties in Oregon.

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The customers in the Central Oregon area include:

- PacifiCorp (PAC)
- Central Electric Cooperative (CEC)
- Midstate Electric Cooperative (MEC)

The Central Oregon load area is served by the following major transmission paths or lines.

- Big Eddy-Redmond 230 kV line
- Round Butte-Redmond 1230 kV line
- Ponderosa-Pilot Butte 230 kV line
- Ponderosa-Prineville 115 kV line

**Alturas:**

The Alturas area includes the northeast corner of Modoc County in northern California including the communities of Canby and Alturas.

The customers in the northern California area include:

- Surprise Valley Electrification Corporation (SVEC)
- PacifiCorp (PAC)

The Alturas load area is served by the following major transmission paths or lines:

- Malin-Hilltop 230 kV (BPA)
- Hilltop-Warner 230 kV (BPA)
- Malin-Alturas 69 kV (PAC)
- Chiloquin-Alturas 115 kV (PAC)

**2.10.2 Local Generation and Load**

The only significant local generation in the area is PGE’s Pelton Round Butte Project. This is a hydroelectric project consisting of three hydroelectric plants, Round Butte Dam (338 MW), Pelton Dam (110 MW), and a reregulating dam (20 MW). The generation is interconnected at PGE’s Round Butte Substation.

The load forecasts for this area that were used for the 2013 system assessment, were higher than the new load forecasts in 2014 and no significant system changes have been identified for this area. Therefore, the results based on load forecasts from 2013 were used for the 2014 assessment. The Central Oregon and Alturas area load forecasts are:

Area	2018 Summer	2018/19 Winter	2023 Summer	2022/23 Winter
Central Oregon Area (MW)	542	770	563	804
Alturas Area (MW)	70	66	85	70

**2.10.3 Proposed Plans of Service**

LaPine 230 kV and 115 kV Circuit Breaker Additions

- Description: This project will add a 230 kV circuit breaker to the high side of the transformer bank No.2 at La Pine Substation. This will also add two 115 kV circuit breakers for the low side of the transformer banks No.1 and No.2 as well as a 115 kV bus tie breaker.

- 
- Purpose: This project will improve Operations and Maintenance (O&M) flexibility.
  - Estimated Cost: \$2,500,000
  - Energization: 2017

## **2.10.4 Recently Completed Plans of Service**

### LaPine Shunt 230 kV Reactor Addition

- Description: This project adds a 230 kV shunt reactor (40 MVAR) at La Pine Substation.
- Purpose: This project is required to maintain voltage schedules in the Central Oregon area during light load conditions.
- Estimated Cost: \$1,800,000
- Energization: 2014

### LaPine Shunt 115 kV Capacitor Addition

- Description: This project adds a 115 kV shunt capacitor (19.6 MVAR) at La Pine Substation.
- Purpose: This project provides reactive support to meet growing loads in Central Oregon.
- Estimated Cost: \$1,300,000
- Energization: 2014

### LaPine 230 kV Bus Tie Breakers Addition

- Description: This project adds a 230 kV bus tie at La Pine Substation.
- Purpose: This project improves Operations and Maintenance (O&M) flexibility.
- Estimated Cost: \$1,500,000
- Energization: 2014

## **2.11 Southwest Washington Coast Area**

### **2.11.1 Description**

The Southwest Washington Coast area is comprised of Wahkiakum county, Pacific county, western Lewis county, and southern Grays Harbor County in Washington. It is bordered on the east by Interstate 5 and the west by the Pacific Ocean. It is bordered on the north by the Olympic National Forest and on the south by the Columbia River. The main communities served include Aberdeen, the Raymond/South Bend area, and the communities on the Long Beach Peninsula.

The customers in this area include:

- Grays Harbor PUD (including some industrial load)
- Pacific County PUD #2
- Lewis County PUD
- Town of McCleary

The load area is served by the following major transmission paths or lines:

- Aberdeen-Satsop 230 kV #2
- Aberdeen-Satsop 230 kV #3
- Olympia-South Elma 115 kV
- Chehalis-Raymond 115 kV #1
- Naselle Tap to the Allston-Astoria 115 kV #1.

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### 2.11.2 Local Generation and Load

Local generation serving the load area includes:

- Wynooche generation –18.7 MW
- Weyerhaeuser generation – 15.8 MW
- Sierra generation – 7.9 MW

The Southwest Washington Coast area load forecast is:

Area	2019 Summer	2019 Winter	2024 Summer	2023/24 Winter
Southwest Washington Coast (MW)	233	376	238	392

### 2.11.3 Proposed Plans of Service

No projects are proposed for this area at this time.

### 2.11.4 Recently Completed Plans of Service

None since the previous planning cycle.

## 2.12 *Spokane/Colville/Boundary Area*

### 2.12.1 Description

This area is located in northeastern Washington State. This load area includes the greater Spokane, Washington area as well as the Colville Valley to the north including the communities of Colville and Chewelah. This area also includes Newport, Washington to the east, as well as Pend Oreille, Stevens and Spokane Counties.

The customers in this area include:

- Avista
- Inland Power and Light
- West Kootenai Power and Light
- Pend Oreille PUD
- Ponderay Newsprint Company

The load area is served by the following major transmission paths or lines:

- Bell-Boundary 230 kV #1 line
- Bell-Boundary 230 kV #2 line
- Usk-Boundary 230 kV line
- Taft Bell 500-kV line
- Bell-Lancaster 230 kV line
- Lancaster-Boulder 230 kV line
- Benewah-Boulder 230 kV line
- Rathdrum-Boulder 230 kV lines
- Grand Coulee-Bell 500 kV line
- three Grand Coulee-Bell 230 kV lines
- Grand Coulee-Westside 230 kV line.

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## 2.12.2 Local Generation and Load

Local generation serving the load area includes:

- Seattle City Light’s Boundary generation (1040 MW)
- Pend Oreille’s Box Canyon generation (66 MW)
- USACE’s Albeni Falls generation (48 MW)
- Avista’s Long Lake generation (88 MW)
- Avista’s Little Falls generation (32 MW)
- USACE’s Dworshak generation (458 MW)
- Avista’s Boulder generation (25 MW)
- Avista’s Post Street generation (10 MW)
- Avista’s Monroe generation (16 MW)
- City of Spokane’s Spokane Waste (22 MW)
- Avista’s Northeast generation (68 MW)
- City of Spokane’s Up River (18 MW)
- Avista’s Nine Mile generation (24 MW)
- Avista’s Post Falls (18 MW)
- Avista’s Kettle Falls generation (52 MW)

The Spokane area load forecast includes:

Area	2019 Summer	2019 Winter	2024 Summer	2023/24 Winter
City of Spokane Net Load (MW)	572	614	602	652

## 2.12.3 Proposed Plans of Service

### Bell 230 kV Bus Sectionalizing Breaker Addition

- Description: This project adds a 230 kV bus sectionalizing breaker at Bell Substation which will split the existing bus section No.1 into two sections.
- Purpose: This project is required to maintain reliable load service to the Spokane area.
- Estimated Cost: \$1,600,000
- Energization: 2015

## 2.12.4 Recently Completed Plans of Service

None since the previous planning cycle.

## 2.13 Centralia/Chehalis Area

### 2.13.1 Description

The Centralia/Chehalis area includes the cities of Chehalis and Centralia, Washington and the communities within Lewis County in Washington. It consists of a 69 kV transmission loop served out of Chehalis Substation. Chehalis Substation also provides service to Lewis County PUD’s Corkins 69 kV Substation and provides support to Raymond and Naselle Substations on the southwest Washington coast.

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The customers in this area include:

- Centralia City Light
- City of Centralia
- Lewis County PUD

The load area is served by the following major transmission paths or lines:

- Chehalis- Olympia 230 kV #1(BPA)
- Chehalis- Covington 230 kV #1(BPA)
- Longview-Chehalis 230 kV #1(BPA)
- Longview-Chehalis 230 kV #2 (BPA)
- Silver Creek-Chehalis 230 kV #1(BPA)
- Chehalis-Mayfield 230 kV #1(BPA)

### **2.13.2 Local Generation and Load**

Local generation serving the load area includes:

- Tacoma Power’s Mossy Rock generation (334 MW)
- Tacoma Power’s Mayfield generation (135 MW)
- Lewis County PUD’s Cowlitz Falls generation (40 MW)
- Energy Northwest’s Glenoma generation (29 MW)
- The City of Centralia’s Yelm generation (10 MW)

The Centralia / Chehalis area load forecast is:

Area	2018 Summer	2017/18 Winter	2023 Summer	2022/23 Winter
Centralia/Chehalis 69 kV Loop (MW)	28	32	44	51
Corkins 69 kV Loop (MW)	100	94	137	151
Corkins 69 kV Loop (MW)	128	126	181	202

### **2.13.3 Proposed Plans of Service**

No projects are proposed for this area at this time.

### **2.13.4 Recently Completed Plans of Service**

None since the previous planning cycle.

## ***2.14 Northwest Montana Area***

### **2.14.1 Description**

This includes the Flathead Valley area of northwest Montana including the communities of Kalispell, and Columbia Falls.

The customers in this area include:

- Flathead Electric Cooperative (FEC)
- Northwestern Energy (NWE)
- Lincoln Electric Cooperative (LEC)

The Northwest Montana load area is served by the following major transmission paths or lines:

- Taft-Hot Springs 500 kV
- Noxon-Hot Springs No.1 230 kV
- Flathead-Hot Springs No.1 230 kV
- Libby-Noxon No.1 230 kV
- Libby-Conkelley No.1 230 kV

### 2.14.2 Local Generation and Load

Local generation serving the load area includes:

- Avista’s Rathdrum generation (154 MW)
- Cogentrix Energy’s Lancaster generation (270 MW)
- Avista’s Cabinet Gorge generation (270 MW)
- USACE’s Noxon generation (567 MW)
- USACE’s Libby generation (605 MW)
- U.S. Bureau of Reclamation’s Hungry Horse generation (430 MW)
- PPL Global’s Kerr generation (194 MW)
- PPL Global’s Colstrip generation (2306 MW)

The Northwest Montana area load forecast includes:

Area	2019 Summer	2019 Winter	2024 Summer	2023/24 Winter
Western Montana (MW)	217	385	270	412
Columbia Falls Aluminum Co. (MW)	268	402	318	427
<b>Total (MW)</b>	<b>485</b>	<b>787</b>	<b>588</b>	<b>839</b>

### 2.14.3 Proposed Plans of Service

No projects are proposed for this area at this time.

### 2.14.4 Recently Completed Plans of Service

#### Kalispell 115 kV Shunt Capacitor Addition

- Description: This project adds 115 kV shunt capacitors (2 groups of 16.2 MVAR) at Kalispell Substation.
- Purpose: This project is required to provide voltage support in the Flathead Valley area.
- Estimated Cost: \$3,000,000
- Energization: 2014

#### Columbia Falls 230 kV Bus Sectionalizing Breaker Addition

- Description: This project adds a 230 kV bus sectionalizing breaker at Columbia Falls Substation.
- Purpose: This project is required to maintain reliable load service to the Flathead Valley area.
- Estimated Cost: \$2,000,000
- Energization: 2014

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## 2.15 Southeast Idaho / Northwest Wyoming Area

### 2.15.1 Description

This load area includes southeast Idaho from Idaho Falls south to Soda Springs and east to Jackson Wyoming. This area is served by Lower Valley Energy. It also includes the area from West Yellowstone, Montana south to Afton, Wyoming which is served by Fall River Electric Cooperative. This area includes the communities of Jackson, Wyoming and Driggs, Idaho.

The customers in this area include:

- Lower Valley Energy (LVE)
- Fall River Electric Cooperative
- U.S. Bureau of Reclamation (USBR)

The load area is served by the following major transmission paths or lines:

- Goshen-Drummond 161 kV line
- Goshen-Swan Valley 161 kV line
- Goshen-Palisades 115 kV line

### 2.15.2 Local Generation and Load

Local generation serving the load area includes:

- USBR Palisades Dam (160 MW) (limited to about 8 MW in the winter)
- Horse Butte Wind Project (100 MW)

The Southeast Idaho / Northwest Wyoming area load forecast is:

Area	2019 Summer	2019 Winter	2024 Summer	2023/24 Winter
SE Idaho / NW Wyoming Area (MW)	181	293	194	315

### 2.15.3 Proposed Plans of Service

#### Lower Valley Area Reinforcement Project

- Description: Construct a new 138/115 kV substation called Hooper Springs Substation and a new 115 kV line.
- Purpose: This project is required to provide reliable load service to the Southeast Idaho area.
- Estimated Cost: \$48,000,000
- Energization: This project is currently under NEPA review (National Environmental Policy Act). BPA expects to complete the review and publish the final Environmental Impact Statement (EIS) in winter 2014/2015. Then, BPA expects to issue a record of decision in early 2015 about whether to build the project, and if so, the alternative selected. If a decision is made to build the project, the project schedule will be established at that time.

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### Drummond Upgrade

- Description: This project will add 115 kV breakers and associated disconnect switches on the high side of the Drummond 115/46 kV transformer banks No.1 and No.3. This project will also upgrade the station service at Drummond.
- Purpose: This project will increase Operations and Maintenance flexibility.
- Estimated Cost: \$1,800,000
- Energization: 2015/16

### Teton 115 kV Bus Tie Addition

- Description: This project will add a 115 kV bus tie breaker at Teton Substation.
- Purpose: This project will increase Operations and Maintenance flexibility.
- Estimated Cost: \$650,000
- Energization: 2016

### Lost River 230 kV Breaker Addition

- Description: Replace a 230 kV Load Break Disconnect (LBD) switch with a 230 kV circuit breaker at Lost River Substation.
- Purpose: This project will improve Operations and Maintenance (O&M) flexibility.
- Estimated Cost: \$1,000,000
- Energization: 2017

### Spar Canyon 230 kV Reactor Addition

- Description: Add a 230 kV 25 MVAR shunt reactor at Spar Canyon Substation.
- Purpose: This project will improve the ability to maintain voltage schedules and increase Operations and Maintenance (O&M) flexibility at Spar Canyon.
- Estimated Cost: \$2,000,000
- Energization: 2017

### Unity 138 kV Breaker Addition

- Description: Replace a 138 kV Motor Operated Disconnect (MOD) switch with a 138 kV circuit breaker at Unity Substation.
- Purpose: This project will improve Operations and Maintenance (O&M) flexibility.
- Estimated Cost: \$1,000,000
- Energization: 2017

## **2.15.4 Recently Completed Plans of Service**

None since the previous planning cycle.

## ***2.16 North Idaho Area***

### **2.16.1 Description**

The North Idaho area is composed of northeast Bonner County and Boundary County in Idaho and western Lincoln County in Montana. The main communities are in the Sandpoint, Idaho vicinity. This area includes Newport, Washington and Priest River, Idaho to the west, Bonners Ferry and Moyie Springs to the north, Troy and Libby, Montana to the east, and the communities along the Clark Fork River in Idaho to the south.

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The customers in this area include:

- Avista
- Northern Lights Electric Cooperative
- City of Bonners Ferry
- Flathead Electric Cooperative

The load area is served by the following major transmission paths or lines:

- Libby-Bonners Ferry 115 kV #1
- Sand Creek-Bonners Ferry 115 kV #1
- Sand Creek-Bonners Ferry 115 kV #2

### **2.16.2 Local Generation and Load**

The local generation in the area includes

- Libby (USCOE) (605MW)
- Cabinet Gorge (Avista) (231 MW)
- Noxon (Avista) (466 MW)
- Albeni Falls (USCOE) (43 MW)
- Hungry Horse (USBR) (428MW)

The North Idaho area load forecast is:

Area	2019 Summer	2018/19 Winter	2024 Summer	2023/24 Winter
North Idaho Area (MW)	119	191	120	194

### **2.16.3 Proposed Plans of Service**

No projects are proposed for this area at this time.

### **2.16.4 Recently Completed Plans of Service**

None since the previous planning cycle.

## ***2.17 North Oregon Coast Area***

### **2.17.1 Description**

The North Oregon Coast area includes Tillamook and Clatsop counties along the Oregon Coast. It is bounded by the Clatsop and Tillamook State Forests on the east and the Pacific Ocean on the west. It is bounded by the Columbia River to the north and Pacific City to the south. The population areas include Astoria, Seaside, Cannon Beach, Manzanita, Tillamook, Oceanside, Hebo, and Pacific City.

The customers in this area include:

- Consumer's Power
- PacifiCorp (PAC)
- Portland General Electric (PGE)
- Tillamook PUD

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The load area is served by the following major transmission paths or lines:

- Allston-Clatsop 230 kV
- Carlton-Tillamook 230kV
- Driscoll-Astoria 115kV
- Keeler-Tillamook 115kV
- Salem-Grand Ronde 115 kV

### **2.17.2 Local Generation and Load**

Local generation serving the load area includes:

- Clatskanie PUD's Wauna generation at James River Mill (27 MW)
- Loki generation (gas turbine) (11MW).

The North Oregon Coast area load forecast is:

Area	2019 Summer	2019 Winter	2024 Summer	2023/24 Winter
North Oregon Coast Area (MW)	31.3	25.6	31.6	25.5

### **2.17.3 Proposed Plans of Service**

#### Toledo 69 kV and 230 kV Bus Tie Breaker Additions

- Description: Add a 69 kV bus tie breaker and a 230 kV bus tie breaker at Toledo Substation.
- Purpose: This project will improve Operations and Maintenance (O&M) flexibility.
- Estimated Cost: \$1,400,000
- Energization: October 2016

### **2.17.4 Recently Completed Plans of Service**

None since the previous planning cycle.

## ***2.18 South Oregon Coast Area***

### **2.18.1 Description**

The South Oregon Coast load area includes the communities of Newport, Waldport, Florence, Reedsport, Coos Bay, Coquille, Bandon, Myrtle Point, Gold Beach, Port Orford, and south to Brookings. The load area is bounded by the north Oregon Coast to the north and the Salem-Albany-Eugene area to the east.

The customers in this area include:

- PacifiCorp (PAC)
- Coos Curry Cooperative (Coos Curry)
- City of Bandon
- Douglas Electric Coop
- Central Lincoln PUD

The load area is served by the following major transmission paths or lines:

- BPA’s 230 kV Lane-Wendson #2
- BPA’s 230kV Alvey-Fairview #1
- BPA’s 230kV Reston-Fairview #2
- BPA’s 230 kV Fairview-Rogue #1 line
- PacifiCorp’s 230 kV Fairview-Isthmus Fairview
- BPA's Santiam-Toledo 230 KV #1

### 2.18.2 Local Generation and Load

There is no local generation in this area.

The South Oregon Coast area load forecast is:

Area	2019 Summer	2018/19 Winter	2024 Summer	2023/24 Winter
South Oregon Coast Area (MW)	207	406	213	429

### 2.18.3 Proposed Plans of Service

#### Wendson 115 kV Bus Tie Addition

- Description: Add a 115 kV bus tie breakers at Wendson Substation.
- Purpose: This project will improve Operations and Maintenance (O&M) flexibility.
- Estimated Cost: \$650,000
- Energization: 2017

#### Fairview Shunt 230 kV Reactor Addition

- Description: This project adds a 230 kV shunt reactor (approximately 40 MVAR) at Fairview Substation.
- Purpose: This project is required to improve system voltage schedules in the South Oregon Coast area.
- Estimated Cost: \$2,500,000
- Energization: 2017

### 2.18.4 Recently Completed Plans of Service

#### Rogue SVC

- Description: Add an SVC (-45 to +50 Mvar) at Rogue Substation.
- Purpose: This project will provides voltage support for the south Oregon Coast.
- Estimated Cost: \$11,900,000
- Energization: 2014

## 2.19 DeMoss/Fossil Area

### 2.19.1 Description

This DeMoss / Fossil load area spans a portion of north central Oregon, including the communities of Maupin, Tygh Valley, and Grass Valley. It encompasses Wasco and Sherman counties in Oregon.

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The customers in this area include:

- Wasco Electric Cooperative (WEC)
- Columbia Basin Electric Cooperative (CBEC)
- Columbia Power Cooperative Association (CPBA)
- PacifiCorp (PAC)

The DeMoss/Fossil load area is served by the following major transmission paths or lines:

- From the north by the Big Eddy-DeMoss 115 kV line.
- From the west by the Big Eddy-Redmond 230 kV line (via Wasco Electric Coop's Maupin-Fossil 69 kV line)

### **2.19.2 Local Generation and Load**

The local generation includes The Dalles Dam (2084 MW), Seawest's Condon Wind (50 MW) and PaTu Wind (10 MW).

The DeMoss / Fossil area load forecast is:

Area	2019 Summer	2018/19 Winter	2024 Summer	2023/24 Winter
DeMoss / Fossil Area (MW)	23.1	32.8	23.8	34.5

### **2.19.3 Proposed Plans of Service**

#### DeMoss-Fossil Shunt Reactive Additions

- Description: This project adds a 69 kV shunt reactor (4 MVAR) at Fossil substation and a 69 kV shunt capacitor (3.5 MVAR) at DeMoss substation.
- Purpose: This project is required to maintain voltage schedules in the local area.
- Estimated Cost: \$2,500,000
- Energization: 2016

### **2.19.4 Recently Completed Plans of Service**

#### DeMoss 69 kV Shunt Reactor Addition

- Description: This project adds 69 kV shunt reactors (2 groups of 2 MVAR each) at DeMoss Substation.
- Purpose: This project is required to reduce high voltages in the DeMoss/Fossil area during light load conditions.
- Estimated Cost: \$2,300,000
- Energization: 2014

## **2.20 Okanogan Area**

### **2.20.1 Description**

This area includes the Okanogan Valley area of north central Washington including the communities of Omak, Brewster, Bridgeport, Winthrop, Twisp, Pateros, Tonasket, and Okanogan.

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The customers in this area include:

- Okanogan PUD
- Okanogan Coop
- Douglas PUD

The load area is served by the following major transmission paths or lines:

- BPA’s 230 kV Chief Joseph-East Omak line
- BPA’s 115 kV Grand Coulee-Okanogan #2 line
- BPA’s 115 kV East Omak Tap to the Grand Coulee-Foster Creek line.
- Douglas PUD’s Wells –Foster-Creek (Douglas).

### **2.20.2 Local Generation and Load**

Generation serving this load area includes:

- Chief Joseph Dam (2,614 MW)
- Grand Coulee Dam (7,079 MW)
- Wells Dam (851 MW)

The Okanogan area load forecast is:

Area	2019 Summer	2018/19 Winter	2024 Summer	2023/24 Winter
Okanogan Area Load (MW)	163	230	180	242

### **2.20.3 Proposed Plans of Service**

No projects are proposed for this area at this time.

### **2.20.4 Recently Completed Plans of Service**

None since the previous planning cycle.

### **2.20.5 Deferred Plans of Service**

#### Winthrop 115kV Shunt Capacitor Addition

- Description: Install a 115 kV shunt capacitor group (21 MVAR) at Winthrop Substation.
- Purpose: This project is needed to provide reactive support to the Okanogan load area.
- Estimated Cost: \$1,100,000
- Energization: Beyond the planning horizon

## ***2.21 Hood River/The Dalles Area***

### **2.21.1 Description**

The Hood River/The Dalles area includes portions of northern Oregon and southern Washington along the Columbia River Gorge. The area spans from Bonneville Dam to the west, to The Dalles Dam to the east. It includes the communities of Cascade Locks, Hood River and The Dalles in Oregon and Stevenson, Carson, White Salmon and Bingen in Washington.

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The customers in this area (and the communities they serve) include:

- Klickitat County PUD (White Salmon and Bingen)
- Skamania County PUD (Stevenson and Carson)
- City of Cascade Locks (Cascade Locks)
- PacifiCorp (Hood River)
- Hood River Electric Coop (Hood River)
- Northern Wasco PUD (The Dalles)
- USBR (The Dalles)

The load area is served by the following major transmission paths or lines:

- Bonneville (PH No.1) - Alcoa 115 kV line
- Bonneville (PH No.1) - North Camas 115 kV line
- Bonneville (PH No.1) - Hood River 115 kV line
- Chenoweth 230/115 kV transformer
- Big Eddy-Chenoweth 115 kV line
- Big Eddy-The Dalles 115 kV line

### **2.21.2 Local Generation and Load**

Generation (nameplate) serving this area includes:

- USCOE's Bonneville Dam 115 kV (224 MW)
- USCOE's Bonneville Dam 230 kV (1004 MW)
- USCOE's The Dalles Dam 115 kV (392 MW)
- USCOE's The Dalles Dam 230 kV (1692) MW)
- SDS Lumber's generation (10 MW)
- Farmers Irrigation District Plant #2 (1.8 MW)

The Hood River / The Dalles area load forecast is:

Area	2019 Summer	2018/19 Winter	2024 Summer	2023/24 Winter
Hood River / The Dalles Area (MW)	201	255	195	262

### **2.21.3 Proposed Plans of Service**

No projects are proposed for this area at this time.

### **2.21.4 Recently Completed Plans of Service**

None since the previous planning cycle.

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## 2.22 Pendleton/LaGrande Area

### 2.22.1 Description

This area includes the eastern Oregon communities of Pendleton and LaGrande.

The customers in this area include:

- Oregon Trail Electric Cooperative (OTEC)
- PacifiCorp (PAC)
- Umatilla Electric Cooperative (UEC)
- Columbia Basin Electric Cooperative (CBEC)

The load area is served by the following major transmission paths or lines:

- From the east by the LaGrande-(IPC) North Powder 230 kV line,
- From the west by the McNary-Roundup 230 kV line.

### 2.22.2 Local Generation and Load

The local generation in the area includes

- Horizon's Elkhorn Valley Wind Project (101 MW)

The Pendleton/La Grande area load forecast is:

Area	2019 Summer	2018/19 Winter	2024 Summer	2023/24 Winter
Pendleton / La Grande Area (MW)	61	65	65	69

### 2.22.3 Proposed Plans of Service

No projects are proposed for this area at this time.

### 2.22.4 Recently Completed Plans of Service

None since the previous planning cycle.

## 2.23 Walla Walla Area

### 2.23.1 Description

This area includes the southeastern Washington city of Walla Walla and the southeastern Oregon community of Milton-Freewater to the south.

The customers in this area include:

- Columbia R.E.A (CREA)
- City of Milton-Freewater
- Umatilla Electric Cooperative (UEC)
- Clearwater Power Co.
- Inland Power and Light
- PacifiCorp (PAC)

---

The load area is served by the following major transmission paths or lines:

- Wanapum-Walla Walla (PAC) 230 kV (PAC)
- Wallula-Walla Walla (PAC) 230 kV (PAC)
- Walla Walla (PAC)- Hurricane 230 kV (IPC)
- Talbot-Walla Walla (PAC) 230 kV (PAC)
- Franklin-Walla Walla 115 kV (BPA)
- Walla Walla-Tucannon River 115 kV (BPA)

### 2.23.2 Local Generation and Load

The local generation in this area includes:

- NextEra Energy Resources - Stateline Wind (92 MW)
- PSE - Hopkins Ridge Wind (157 MW)
- Infigen - Combine Hills II Wind (63 MW)
- NextEra Energy Resources - Vansycle Ridge Wind (25 MW)

The Walla Walla load area load forecast is:

Area	2019 Summer	2018/19 Winter	2024 Summer	2023/24 Winter
Walla Walla Area (BPA only) (MW)	92	63.5	100.4	71

### 2.23.3 Proposed Plans of Service

No projects are proposed for this area at this time.

### 2.23.4 Recently Completed Plans of Service

#### Walla Walla-Pendleton 69 kV Line Upgrade

- Description: This project upgrades the Walla Walla-Pendleton 69 kV #1 line.
- Purpose: This project increases the capacity of the line to support local generation in the area.
- Estimated Cost: \$1,600,000
- Energization: 2014

#### Tucannon River 115 kV Shunt Capacitor Addition

- Description: This project adds 115 kV shunt capacitors (2 groups of 6.5 MVAR) at Tucannon River Substation.
- Purpose: This project is required to provide voltage support for the Walla Walla area.
- Estimated Cost: \$2,850,000
- Energization: 2014

## 2.24 *Burley Area (southern Idaho)*

### 2.24.1 Description

The Burley area is located in Minidoka and Cassia counties in south central Idaho. This area includes the communities of Burley, West Burley, Riverton, Minidoka, Rupert, and Heyburn. The area load is mostly residential and irrigation. Loads peak during the summer due to the irrigation load component.

The customers in this area include:

- 
- Idaho Power
  - Raft River Electric Coop
  - Riverside Electric
  - South Side Electric
  - United Electric Coop
  - Wells Rural Electric
  - U.S. Bureau of Reclamation
  - Burley Irrigation District
  - East End Mutual
  - Farmers Electric
  - The Cities of Albion, Burley, Declo, Heyburn, Rupert, and Minidoka.

This area is served by Idaho Power transmission facilities.

### **2.24.2 Local Generation and Load**

Local generation in this load service area includes, Minidoka Power House (28 MW), Milner Power Plant (58 MW), and Bridge Geothermal (13 M). The load area load forecast is:

Area	2019 Summer	2018/19 Winter	2024 Summer	2023/24 Winter
Burley Area	428	253	460	262

### **2.24.3 Proposed Plans of Service**

No projects are proposed for this area at this time.

### **2.24.4 Recently Completed Plans of Service**

None since the previous planning cycle.

### 3 Transfer Areas and Paths

BPA’s service territory includes 5 inter-regional transmission paths (interties) and 14 monitored paths or flowgates within the region (intra-regional). These 19 paths are grouped into 7 Transfer Areas. The paths and transfer areas are listed in Table 3.1 below.

Transfer Areas	Paths/Flowgates
Northwest to California	California to Oregon Intertie
	Pacific DC Intertie
	North-of-John Day
	North-of-Hanford
Lower Columbia	West-of-McNary
	West-of-Slatt
	West-of-John Day
Seattle to Portland	Raver-Paul
	Paul-Allston
	South-of-Allston
West of Cascades South	West-of-Cascades South
Puget Sound to Canada	North-of-Echo Lake
	South-of-Custer
	Northwest-Canada
West of Cascades North	West-of-Cascades North
Montana to Northwest	West-of-Hatwai
	West-of-Lower Monumental
	Montana-to-Northwest
	South of Boundary

Table 3.1 Transfer Areas with Associated Paths

#### 3.1 Northwest to California Transfer Area

The Northwest to California (NW-CA) paths are the core main grid facilities that support the transfer of power from the Pacific Northwest to California. These paths are bi-directional and have multiple uses. However, the most prevalent use is to transfer power in the north to south direction

##### 3.1.1 California-Oregon AC Intertie WECC Path 66

###### Description

This path is the alternating current (AC) Intertie between Oregon and California. The path is monitored at the Oregon-California border south of Malin and Captain Jack Substations. The path includes the following lines:

- Malin-Round Mountain 500 kV No.1
- Malin-Round Mountain 500 kV No.2
- Captain Jack-Olinda 500 kV

###### Proposed Plans of Service

No projects are proposed for this path at this time.

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### **3.1.2 Pacific DC Intertie WECC Path 65**

#### **Description**

This path is the direct current Intertie between Oregon and California and consists of a 500 kV high voltage direct current (HVDC) connection from BPA's Celilo Substation in Oregon to the Los Angeles Department of Water and Power's (LADWP) Sylmar Substation in California.

#### **Proposed Plans of Service**

##### PDCI Uprate

- Description: This project replaces the converters at the Celilo HVDC terminal and re-conductors a section of the DC transmission line
- Purpose: This project will increase the capacity of the Pacific DC Intertie.
- Estimated Cost: \$450,000,000
- Energization: 2016 (Celilo DC upgrade only)

### **3.1.3 North of John Day WECC Path 73**

#### **Description**

This path is located north of John Day Substation in Oregon. The path includes the following lines:

- Raver-Paul 500 kV (BPA)
- Wautoma-Ostrander 500 kV (BPA)
- Wautoma-Rock Creek 500 kV (BPA)
- Ashe-Marion 500 kV No.2 (BPA)
- Ashe-Slatt 500 kV No.2 (BPA)
- Lower Monumental-McNary 500 kV (BPA)

#### **Proposed Plans of Service**

West of McNary Reinforcement Phase II - Refer to project description under Proposed Plans of Service for the West of McNary Path (section 3.2.1).

### **3.1.4 North of Hanford**

#### **Description**

This path is located north of Hanford substation between Hanford and Grand Coulee. This path includes the following lines:

- Grand Coulee-Hanford 500 kV No.1 (BPA)
- Schultz-Wautoma 500 kV No.1 (BPA)
- Vantage-Hanford 500 kV No.1 (BPA)

#### **Proposed Plans of Service**

No projects are proposed for this path at this time.

## **3.2 Lower Columbia Transfer Area**

The Lower Columbia Transfer Area includes the area along the lower Columbia River east of Umatilla, Oregon and west to The Dalles, Oregon. It includes the West of McNary (WOM), West of Slatt (WOS) and West of John Day (WOJ) paths. All three paths peak during the spring and summer months with power flowing in the east to west direction. All three paths are in series, but do not necessarily peak simultaneously due to a unique geographic interconnection of generation in the Lower Columbia area.

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There are large generation hubs of hydro, wind and thermal plants between each path that can operate independently and create non-simultaneous peak flow conditions on each path.

### **3.2.1 West of McNary**

#### **Description**

This path is located between McNary and Slatt substations in Oregon. This path includes the following lines:

- McNary-John Day 500 kV No.2 (BPA)
- McNary-Ross 345 kV No.1 (BPA)
- Harvalum-Big Eddy 230 kV No.1 (BPA)
- Jones Canyon-Santiam 230 kV No.1 (BPA)
- Coyote Springs-Slatt 500 kV No.1 (BPA)

#### **Proposed Plans of Service**

##### West of McNary Reinforcement Phase II

- Description: This proposed project includes a new 500 kV transmission line (approximately 28 miles) between Big Eddy substation and a new 500 kV substation (Knight). Knight Substation is a new 500 kV substation near Goldendale, Washington, along the Wautoma-Ostrander 500 kV transmission line.
- Purpose: This proposed project addresses the issue of meeting the FERC Open Access requirements by building the necessary transmission facilities to accommodate requests for firm transmission service across BPA's network. The project also addresses the issue of increased reliability to loads in the southwest Washington and Willamette Valley vicinity. This project was identified in the 2008 Network Open Season.
- Estimated Cost: \$124,000,000
- Energization: 2015

### **3.2.2 West of Slatt**

#### **Description**

This path is located between Slatt and John Day Substations in Oregon. This path includes the following lines:

- Slatt-John Day 500 kV No.1 (BPA)
- Slatt-Buckley 500 kV No.1 (BPA)

#### **Proposed Plans of Service**

West of McNary Reinforcement Phase II - Refer to project description under Proposed Plans of Service for the West of McNary Path (section 3.2.1).

### **3.2.3 West of John Day**

#### **Description**

This path is located between John Day Substation and The Dalles Substation in Oregon. This path includes the following lines:

- John Day-Big Eddy 500 kV No.1(BPA)
- John Day-Big Eddy 500 kV No.2 (BPA)
- John Day-Marion 500 kV No.1 (BPA)

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### **Proposed Plans of Service**

West of McNary Reinforcement Phase II - Refer to project description under Proposed Plans of Service for the West of McNary Path (section 3.2.1).

## ***3.3 Seattle to Portland Transfer Area***

The Seattle to Portland Transfer Area is located west of the Cascade Mountains and roughly follows the I-5 Corridor. This Transfer Area includes the following paths: Raver-Paul (RP), Paul-Allston (PA), and South of Allston (SOA) paths.

The Seattle to Portland Transfer Area is the primary transmission corridor between the two largest northwest load centers. Flows between Seattle and Portland are impacted not only by load service, but also by the schedules on the series paths just to the north (Northern Intertie) and south (COI and PDCI). An adjacent path which also impacts this Transfer Area is West of Cascades South (WOCS).

### **3.3.1 Raver-Paul**

#### **Description**

This path is located between Raver and Paul Substations in western Washington. This path includes the following line:

- Raver-Paul 500 kV No.1 (BPA)

#### **Proposed Plans of Service**

No projects are proposed for this path at this time.

### **3.3.2 Paul-Allston**

#### **Description**

The I-5 Corridor transmission system extends from the Canadian border to the California border west of the Cascades Mountain Range. This portion of the path extends roughly from Chehalis, Washington to Rainier, Oregon. This path provides load service to the Willamette Valley. There are long-standing congestion issues with this path. The path includes the following lines:

- Paul-Allston 500 kV No.2 (BPA)
- Napavine-Allston 500 kV No.1 (BPA)

#### **Proposed Plans of Service**

I-5 Corridor Reinforcement Project - Refer to project description under Proposed Plans of Service for the South of Allston Path (section 3.3.3).

### **3.3.3 South of Allston WECC Path 71**

#### **Description**

The I-5 Corridor transmission system extends from the Canadian border to the California border west of the Cascades Mountain Range. This portion of the path is located south of Allston Substation in Northwest Oregon. This path provides both load service to the Willamette Valley as well as accommodating transmission service requests. There are long-standing congestion issues with this path. The path includes the following facilities:

- 
- Allston-Keeler 500 kV (BPA)
  - Trojan-Rivergate 230 kV (PGE)
  - Trojan-St Marys 230 kV (PGE)
  - Ross-Lexington 230 kV (BPA)
  - St.Helens-Allston 115 kV (BPA)
  - Merwin-St.Johns 115 kV (PAC)
  - Astoria-Seaside 115 kV (PAC)
  - Clatsop 230/115 kV (BPA)

### **Proposed Plans of Service**

#### Pearl 500 kV Upgrades

- Description: This project adds a 500 kV circuit breaker at Pearl Substation and re-terminates the Pearl 500/230 kV transformer No.2 into the new bay position.
- Purpose: This project will improve system reliability for the South of Allston path.
- Estimated Cost: \$2,100,000
- Energization: 2016

#### I-5 Corridor Reinforcement Project

- Description: This proposed project includes a new 500 kV transmission line (approximately 70 miles) between a new substation in the vicinity of Castle Rock, Washington and a new substation in Troutdale, Oregon.
- Purpose: This project addresses the issue of providing reliable service to loads in southwest Washington and northwest Oregon. This project also meets the FERC Open Access requirements by building the necessary transmission facilities to accommodate requests for firm transmission service across BPA's network. This project was identified in the 2008 Network Open Season.
- Estimated Cost: \$459,000,000
- Energization: This current project schedule is 2018. The project is currently going through the environmental review (NEPA) process. The final Environmental Impact Statement (EIS) is expected to be released in late 2015, followed by a Record of Decision (ROD) in 2016. If BPA decides to build the project, the schedule will be re-evaluated.

### **3.4 West of Cascades South**

The West of Cascades South Transfer Area includes only the West of Cascades south (WOCS) path. This is a load serving east to west path that transfers power across the Cascades Mountains from Central Washington and northern Oregon to southwest Washington, the Willamette Valley and the Oregon Coast load centers. The WOCS path flow is always in the east to west direction and primarily winter peaking. For spring and early summer operation, high flows on the WOCS path typically occur when there is surplus hydro and wind generation east of the Cascades and thermal generation in the Southwest Washington/Northwest Oregon area is off-line for maintenance or other reasons.

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### **3.4.1 West of Cascades South WECC Path 5**

#### **Description**

This path spans the southern portion of the Cascade Mountains between eastern and western Oregon. The path includes the following lines:

- Big Eddy-Ostrander 500 kV (BPA)
- Ashe-Marion 500 kV No.2(BPA)
- Buckley-Marion 500 kV No.1(BPA)
- Wautoma-Ostrander 500 kV (BPA)
- John Day-Marion 500 kV (BPA)
- McNary-Ross 345 kV (BPA)
- Big Eddy-McLoughlin 230 kV (BPA)
- Big Eddy-Chemawa 230 kV (BPA)
- Midway-North Bonneville 230 kV (BPA)
- Jones Canyon-Santiam 230 kV (BPA)
- Big Eddy-Troutdale 230 kV (BPA)
- Round Butte-Bethel 230 kV (PGE)

#### **Proposed Plans of Service**

No projects are proposed for this path at this time.

### ***3.5 Puget Sound to Canada Transfer Area***

This transfer area includes paths between the Puget Sound area and Canada. Flows from the US to Canada are primarily captured by monitoring the main grid circuits from Northwestern Washington to the US-Canada border. These transfers are critical because they flow through and parallel to the local network of the largest load center in the Pacific Northwest, the Puget Sound. Adjacent flowgates not included in this transfer area that have direct or indirect impacts include West of Cascades North (WOCN) and Raver-Paul. WOCN can sometimes impose flow limitations. The Puget Sound to Canada Transfer Area includes the, North of Echo Lake (NOEL) South of Custer (SOC) and Northern Intertie West (NI-W) paths.

#### **3.5.1 North of Echo Lake**

##### **Description**

This path is located north of Echo Lake Substation in the Puget Sound area of Washington. This path includes the following lines:

- Echo Lake-Maple Valley 500 kV No.1 & No.2 (BPA)
- Echo Lake-Snoking-Monroe 500 kV (BPA)
- Covington-Maple Valley 230 kV No.2 (BPA)

##### **Proposed Plans of Service**

No projects are proposed for this path at this time.

#### **3.5.2 South of Custer**

##### **Description**

This path is located south of Custer Substation in the Bellingham area of Washington State. This path includes the following lines:

- 
- Monroe-Custer 500 kV No.1 and No.2 (BPA)
  - Custer-Bellingham 230 kV No.1 (BPA)
  - Custer-Murray 230 kV No.1 (BPA)

#### **Proposed Plans of Service**

No projects are proposed for this path at this time.

### ***3.6 Northwest-British Columbia (Northern Intertie-West) WECC Path 3***

#### **Description**

This path is the intertie between the United States and Canada. It has a western and an eastern component. This path includes the following lines:

- Custer (BPA)-Ingledow (BCTC) 500 kV No.1
- Custer (BPA)-Ingledow (BCTC) 500 kV No.2
- Boundary (BPA)-Waneta (Fortis BC) 230 kV
- Boundary (BPA)-Nelway (BCTC) 230 kV

#### **Proposed Plans of Service**

##### Monroe 500 kV Line Re-terminations

- Description: This project reconfigures Monroe Substation by developing a new 500 kV bay and re-terminating the Custer and Chief Joseph 500 kV lines.
- Purpose: This project will increase reliability and capacity on the Northern Intertie.
- Estimated Cost: \$5,700,000
- Energization: 2018

### ***3.7 West of Cascades North Transfer Area***

The West of Cascades North Transfer Area includes the single West of Cascades North (WOCN) path. The path monitors east-to-west transfers that primarily serve load in Northwest Washington. These transfers are critical to reliable load service because the load centers in NW Washington and the Puget Sound are the largest in the entire Pacific Northwest. The path typically peaks during winter conditions when the load centers in NW Washington peak. High flows can also occur in the spring and summer months with surplus generation conditions east of the Cascades or with large amounts of generation offline in western Washington; however the flows are significantly less than the winter conditions. The large generation hubs in the east include Upper Columbia hydro generation, Mid-Columbia hydro, and eastern wind plants.

#### **3.7.1 West of Cascades North WECC Path 4**

##### **Description**

This path spans the northern portion of the Cascade Mountains between eastern and western Washington. The path includes the following lines:

- Chief Joseph-Monroe 500 kV (BPA)
- Schultz-Raver 500 kV No.1 (BPA)
- Schultz-Raver 500 kV No.3 (BPA)
- Schultz-Raver 500 kV No.4 (BPA)

- Schultz-Echo Lake 500 kV (BPA)
- Chief Joe-Snohomish 345 kV No.3 (BPA)
- Chief Joe-Snohomish 345 kV No.4 (BPA)
- Rocky Reach-Maple Valley 345 kV (BPA)
- Coulee-Olympia 300 kV (BPA)
- Rocky Reach-Cascade 230 kV (PSE)
- Bettas Road-Columbia 230 kV No.1 (BPA)

#### **Proposed Plans of Service**

##### Schultz-Raver 500 kV No.3 & No.4 Series Capacitors

- Description: This project adds 500 kV series capacitors at Schultz substation on the Schultz-Raver 500 kV lines No.3 and No.4.
- Purpose: This project is required to increase capacity on the West of Cascades North path
- Estimated Cost: \$35,000,000
- Energization: beyond 2021

### ***3.8 Montana to Northwest Transfer Area***

Flows across the Montana to Northwest transfer area are captured by monitoring three paths, the Montana-Northwest path (MT-NW), West-of-Hatwai path (WOH), and the West-of-Lower Monumental path (WOLM). In addition, flows from Boundary to Bell substation that also flow across the WOH path are captured by monitoring the South-of-Boundary path (SOB). The MT-NW path is a multiple owner path and includes facilities owned by BPA, NorthWestern Energy (NWE), and Avista (AVA). NorthWestern Energy is the path operator for the MT-NW path. NorthWestern Energy conducts assessments of the transfer capability limits for the MT-NW path. The SOB path transfers local generation at Boundary Dam and transfers to and from Canada at Nelway.

#### **3.8.1 Montana-Northwest (MT-NW) WECC Path 8**

##### **Description**

This path is the intertie between Montana and the Northwest. This path includes the following lines:

- Broadview (NWE)-Garrison (BPA) 500 kV #1
- Broadview (NWE)-Garrison (BPA) 500 kV #2
- Mill Creek-Garrison 230 kV
- Anaconda-Garrison 230 kV
- Ovando-Garrison 230 kV
- Placid Lake-Hot Springs 230 kV
- Rattlesnake 230/161 kV transformer
- Kerr-Kalispell 115 kV
- Thompson Falls-Burke 115 kV
- Crow Creek-Burke 115 kV

##### **Proposed Plans of Service**

Montana to Washington – The 2010 Network Open Season identified some reinforcements to the transmission system between Montana and Washington (primarily series and shunt

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compensation) that would be needed to accommodate the transmission service requests. The project is currently undergoing NEPA review (National Environmental Policy Act). The project scope, cost, and schedule, will be established when the NEPA review is complete.

### **3.8.2 West of Hatwai (WOH) WECC Path 6**

#### **Description**

This path is located between northern Idaho (Lewiston area) and eastern Washington. The path includes the following lines:

- Hatwai (BPA)-Lower Granite (BPA) 500 kV
- Bell (BPA)-Coulee (USBR) 230 kV No.3
- Bell (BPA)-Coulee (USBR) 230 kV No.5
- Westside (AVA)- Grand Coulee (BPA) 230 kV
- Dry Creek (AVA)-Talbot (PAC) 230 kV
- Bell (BPA)-Creston (BPA) 115 kV
- North Lewiston (AVA)-Tucannon River (BPA) 115 kV
- Harrington (AVA)-Odessa (AVA) 115 kV
- Lind (AVA)-Roxboro (AVA) 115 kV
- Dry Gulch (AVA) 115/69 kV
- Bell (BPA) – Grand Coulee (USBR) 500kV

#### **Proposed Plans of Service**

Montana to Washington – The 2010 Network Open Season identified some reinforcements to the transmission system between Montana and Washington (primarily series and shunt compensation) that would be needed to accommodate the transmission service requests. The project is currently undergoing NEPA review (National Environmental Policy Act). The project scope, cost, and schedule, will be established when the NEPA review is complete.

### **3.8.3 West of Lower Monumental (WOLM)**

#### **Description**

This path is between Lower Monumental and McNary Substations. This path includes the following lines:

- Lower Monumental-Ashe 500 kV (BPA)
- Lower Monumental-Hanford 500 kV (BPA)
- Lower Monumental-McNary 500 kV (BPA)

#### **Proposed Plans of Service**

##### Central Ferry-Lower Monumental 500 kV Line

- Description: This proposed project includes a new 500 kV transmission line (approximately 40 miles) between a new Central Ferry Substation located southeast of Little Goose Dam and the existing Lower Monumental Substation.
- Purpose: This project is required to increase capacity from Central Ferry to Lower Monumental in order to accommodate transmission service requests associated with new wind generation. This project was identified in the 2008 Network Open Season.
- Estimated Cost: \$92,000,000
- Energization: 2016

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### ***3.9 South of Boundary (SOB)***

#### **Description**

This path is south of Boundary Substation in northeastern Washington. This path includes the following lines:

- Bell-Boundary 230 kV No.1 (BPA)
- Bell-Boundary 230 kV No.3 (BPA)
- Usk-Boundary 230 kV (BPA)
- Usk-Bell 230 kV (BPA)

#### **Proposed Plans of Service**

No projects are proposed for this path at this time.

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## 4 Generator Interconnections

The projects included in this section include those that have a requested generator interconnection (GI) greater than 20 MW (Large Generator Interconnection Request) and which have an executed Large Generator Interconnection agreement (LGIA). BPA still has approximately 10,000 MW of large GI Requests in the GI Queue. However, virtually all of these are on hold waiting to obtain power purchase agreements (PPA's) before proceeding. Due to the uncertainty, BPA has included only those projects which have executed an LGIA. Those with an executed LGIA have a well-defined plan of service, and a reasonable estimate of cost and schedule.

### 4.1 John Day Area Generator Interconnections

There are a number of large Generator Interconnection Requests for interconnection at John Day Substation.

#### John Day Substation Additions

- Description: This project includes facility additions at John Day Substation in support of Request G0099.
- Purpose: Provide interconnection to the transmission system for new wind projects.
- Estimated Cost: \$3,500,000
- Energization: In service date is contingent on the generation developer's schedule.

### 4.2 Rock Creek Area Generator Interconnections

There are a number of large Generator Interconnection Requests for interconnection at Rock Creek Substation.

#### Rock Creek Substation Additions

- Description: This includes facility additions at Rock Creek substation in support of request G0222.
- Purpose: provide interconnection to the transmission system for new wind projects.
- Estimated Cost: This project is currently on hold.
- Energization: In service date is contingent on the generation developer's schedule.

## 5 Line and Load Interconnections

The project included in this section include projects that have a requested a line and load interconnection. Similar to the generator interconnections above, BPA has only included those line and load interconnections which have a significant impact to the BPA transmission system and for which there are executed construction agreements with the customer.

### Recently Completed:

#### PSE St. Clair Substation Addition (L0276)

- Description: This project would interconnect Puget Sound Energy's (PSE) proposed St.Clair 230 kV Substation expansion and 230/115 kV transformer addition. The plan of

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service would be to loop the Olympia-South Tacoma 230 kV No.1 line into PSE's St.Clair Substation. Reference L0276.

- Purpose: Provide requested interconnection to the transmission customer.
- Estimated Cost: \$900,000
- This project was completed in June 2014

**Proposed:**

La Pine-Benham Falls 115 kV Line Interconnection (L0296)

- Description: This project will add a new 115 kV bay at BPA's La Pine Substation to interconnect Mid-State Electric's new 115 kV line to Benham Falls. Reference L0296.
- Purpose: Provide requested interconnection to the transmission customer.
- Estimated Cost: \$1,341,886
- Energization: 2015

Umatilla Electric Coop Line and Load Phase 1 (L0337, L0340, L0342, L0351, L0352)

- Description: This project constructs a new 230/115 kV substation called Morrow Flats about 1.3 miles east of BPA's existing Boardman Substation. This project loops in two 230 kV lines and adds one 230/115 kV transformer. This also includes a new 230/115 kV transformer at McNary and 230 kV line upgrades.
- Purpose: The project is necessary to accommodate load additions in the Boardman/Hermiston area.
- Estimated Cost: \$44,100,000
- Energization: 2016

Umatilla Electric Coop Line and Load Phase 2

- Description: This project adds a second 230/115 kV transformer at Morrow Flats Substation.
- Purpose: The project is necessary to accommodate load increases in the Boardman/Hermiston area.
- Estimated Cost: \$10,500,000
- Energization: Date contingent on customer's schedule.

(PacifiCorp) Canby Interconnection (L0349)

- Description: This project will add a new 69 kV bay at Canby Substation. This will accommodate two new 69 kV line positions – one for PacifiCorp's Line 5 to Alturas 69 kV, and the other line to Surprise Valley Electrification Corporation's Canby Substation. Reference L0349.
- Purpose: Provide requested interconnection to the transmission customer.
- Estimated Cost: \$1,820,000
- Energization: 2017