

TRANSMISSION PLANNING**GENERATION INTERCONNECTION REPORT****2025 TRANSITION CLUSTER STUDY (TCS)****CLUSTER AREA: TRI-CITIES/UMATILLA #1, PHASE 1, Revision 1****(25TCS CA-TU1 P1-1)**

G0708	G0924
G0752	G0925
G0777	G0935
G0822	G0944
G0908	G0963
G0919	G0998
G0920	G1015
G0923	

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<u>Version</u>	<u>Summary of Edits</u>
0.0	Original
1.0	Errata, Customer Modifications, Cost Allocations. Withdrawals: G0778, G0834, G0854, G0855 G0872, G0965, G1012, G1013



Table of Contents

1	Executive Summary	1
2	Purpose.....	3
3	Disclaimers	3
4	Study Assumptions	4
4.1	General Assumptions.....	4
4.2	Senior-Queued IRs and non-BPA IRs	5
4.3	Communications and Control Capability (C&C)	6
5	Study Methodology.....	6
5.1	Cluster Area Definition.....	6
5.2	Studied POIs	7
5.3	Starting Base Cases.....	7
5.3.1	Load and Resource Scenario Descriptions	8
5.4	Phase 1 POI Injection Tests	8
5.5	Phase 1 POI Short Circuit Ratio Strength Tests	8
6	Contingent Facilities Assumed In-Service.....	8
6.1	Contingent Facilities	8
7	Technical Analysis & Study Results.....	9
7.1	POI – Ashe 500 kV	9
7.2	POI – Lower Monumental – Hanford #1 500 kV	9
7.3	POI – Little Goose – Lower Monumental #2 500 kV	10
7.4	POI – Longhorn 500 kV	10
7.5	POI – Sixmile Canyon 500 kV	11
7.6	POI – Sixmile Canyon 230 kV	11
7.7	POI – Webber Canyon 500 kV	11
7.8	POI – UEC Blueridge 230 kV	11
8	Affected System Impacts	12
9	Interconnection Facility Requirements	12
9.1	POI – Ashe 500 kV	12
9.2	POI – Lower Monumental – Hanford #1 500 kV	13
9.3	POI – Little Goose – Lower Monumental #2 500 kV	13
9.4	POI – Longhorn 500 kV	13
9.5	POI – Sixmile Canyon 500 kV	14
9.6	POI – Sixmile Canyon 230 kV	14
9.7	POI – Webber Canyon 500 kV	15
9.8	POI – UEC Blueridge 230 kV	15
10	Project One-Line Drawings	16
10.1	POI – Ashe 500 kV	16
10.2	POI – Lower Monumental – Hanford #1 500 kV	17
10.3	POI – Little Goose – Lower Monumental #2 500 kV	17
10.4	POI – Longhorn 500 kV	18



10.5	POIs– Sixmile Canyon 500kV and 230 kV	18
10.6	POI – Webber Canyon 500 kV	19
10.7	POI – UEC Blueridge 230 kV	20
10.8	SPB: Lower Monumental – Stanfield 500 kV Reinforcement	21
11	Cost and Schedules	22
11.1	Estimated Schedule	22
11.2	Cost Estimates and Cost Allocations	22
11.3	POI – Ashe 500 kV	24
11.4	POI –Lower Monumental – Hanford #1 500 kV	26
11.5	POI – Little Goose – Lower Monumental #2 500 kV	27
11.6	POI – Longhorn 500 kV	28
11.7	POI – Sixmile Canyon 500 kV	29
11.8	POI – Sixmile Canyon 230 kV	30
11.9	POI – Webber Canyon 500 kV	31
11.10	POI– UEC Blueridge 230 kV	32
11.11	SPB1: Lower Monumental – Stanfield 500 kV Reinforcement	33



1 Executive Summary

In 2025, Bonneville Power Administration (BPA) initiated the Transition Cluster Study (TCS) under the new Large Generator Interconnection Transition Process, Attachment R of BPA's Open Access Transmission Tariff (OATT).¹ BPA received 167 Transition Requests that were eligible to participate in the Transition Cluster Study with a total requested Interconnection Service level of approximately 61,100 MW.

This TCS Phase One Cluster Study (TCS PH1) report examines the feasibility and impact of interconnecting the proposed generation projects to BPA's transmission system. Requests in the Cluster Area were studied at the Points of Interconnection (POIs) according to table below. The generation type, requested MW of Interconnection Service level, project location, and requested Commercial Operation Date are also shown.

Revision #1 of this report captures customer modifications made after TCS PH1 including reallocated costs, minor errata corrections, and withdrawals of the following requests: G0778, G0834, G0854, G0855, G0872, G0965, G1012, and G1013.

Cluster Area Tri-Cities/Umatilla 1 (TU1) is comprised of Generation Interconnection Requests (IRs) in the Benton, Franklin, and Walla Walla Counties of Washington State and the Morrow and Umatilla Counties of Oregon State. It includes 15 total IRs seeking a combined total of 6,736 MW of Interconnection Service and 4,490 MW total of grid charging.

Table 1.1: 2025 TCS PH1 TU1 Participants

GI #	Gen Type	Studied POI	MW Requested (Gen)	MW Requested (Charge)	Plant Location (County, State)
G0708	BESS	Sixmile Canyon 230 kV	0	-60	Morrow, OR
G0752	Solar/BESS/Gas	Longhorn 500 kV	340	-330	Morrow, OR
G0777	Solar	Sixmile Canyon 500 kV	650	-650	Morrow, OR
G0822	Solar/BESS	Ashe 500 kV	2000	-2000	Benton, WA
G0908	Solar/BESS	UEC Blueridge 230 kV	0	-200	Umatilla, OR
G0919	Steam/Nuclear	Ashe 500 kV	220	0	Benton, WA
G0920	Solar/BESS	Webber Canyon 500 kV	500	-300	Benton, WA
G0923	BESS	New Little Goose-Lower Monumental #2 500 kV midline POI	100	-100	Walla Walla, WA
G0924	Solar	New Little Goose-Lower Monumental #2 500 kV midline POI	100	-100	Walla Walla, WA
G0925	Wind	New Little Goose-Lower Monumental #2 500 kV midline POI	100	-100	Walla Walla, WA
G0935	Solar	New Little Goose-Lower Monumental #2 500 kV midline POI	225	0	Walla Walla, WA
G0944	Solar	Sixmile Canyon 230 kV	261	0	Morrow, OR
G0963	BESS	Sixmile Canyon 500 kV	650	-650	Morrow, OR

¹ Capitalized terms that are not defined in the text of this report refer to defined terms in BPA's OATT.



GI #	Gen Type	Studied POI	MW Requested (Gen)	MW Requested (Charge)	Plant Location (County, State)
G0998	Steam/Nuclear	Ashe 500 kV	960	0	Benton, WA
G1015	Solar	New Lower Monumental-Hanford 500 kV	270	0	Franklin, WA

Studied POI locations and requirements for each IR are summarized in Table 1.2. Scalable Plan Blocks (SPB) are indicated where applicable.

All IRs will be required to have the necessary communications and controls equipment installed to be available for generator tripping to maintain flexibility and effectiveness of BPA's Main Grid Remedial Action Schemes (RAS).

Table 1.2: 2025 TCS PH1 TU1 Requirements

GI #	Studied POI	Total GI Scope	Total Cost (\$M)	Contingent Facilities
G0822	ASHE 500 kV	2x Ashe 500 kV Terminals SPB: Lower Monumental – Stanfield 500 kV line BPA RAS Participation (South of Ashe, WOLM)	\$317M	Stanfield 500/230 kV Substation
G0919	ASHE 500 kV	SPB: Lower Monumental – Stanfield 500 kV line BPA RAS Participation (South of Ashe, WOLM)	\$38M	Stanfield 500/230 kV Substation
G0998	ASHE 500 kV	1x Ashe 500 kV Terminal SPB: Lower Monumental – Stanfield 500 kV line BPA RAS Participation (South of Ashe, WOLM)	\$203M	Stanfield 500/230 kV Substation
G0908	UEC Blueridge 230 kV	BPA RAS Participation (Longhorn LRAS)	\$15M	N/A
G0752	Longhorn 500 kV	1x Longhorn 500 kV Terminal SPB: Lower Monumental – Stanfield 500 kV line BPA RAS Participation (South of Ashe, WOS)	\$111M	N/A
G0923 G0924 G0925 G0935	New LIGO-LOMO #2 500 kV	New 500 kV POI Ring Bus SPB: Lower Monumental – Stanfield 500 kV line BPA RAS Participation (South of Ashe, WOLM)	\$240M	Stanfield 500/230 kV Substation
G1015	New LOMO-HANF 500 kV	New 500 kV POI Ring Bus BPA RAS Participation (South of Ashe, WOLM)	\$170M	Stanfield 500/230 kV Substation
G0708 G0944	Sixmile Canyon 230 kV	1x Sixmile Canyon 230 kV Terminal BPA RAS Participation (WOS)	\$45M	Sixmile Canyon 500/230 kV Substation
G0777 G0963	Sixmile Canyon 500 kV	1x Sixmile Canyon 500 kV Terminal BPA RAS Participation (WOS)	\$59M	Sixmile Canyon 500/230 kV Substation
G0920	Webber Canyon 500 kV	BPA RAS Participation (WOS, Webber Canyon)	\$35M	Webber Canyon 500 kV Substation

BPA's construction of equipment and facilities required to interconnect a generator typically takes between 3 and 10 years to complete depending on the scope and scale of the plan of service. The estimated time to construct a plan of service is refined through the subsequent stages of the interconnection process.



2 Purpose

The Bonneville Power Administration (BPA) processes requests to interconnect Large Generating Facilities to the BPA Transmission System under the Large Generator Interconnection Transition Process, Attachment R of BPA's OATT, and the Standard Large Generator Interconnection Procedures (LGIP), Attachment L of BPA's OATT. BPA conducted the TCS PH1 to evaluate the impacts of all eligible Transition Requests in the Transition Cluster on the reliability of BPA's Transmission System. The TCS PH1 evaluates equipment and facilities required to reliably interconnect requests at the requested MW of Interconnection Service. The TCS PH1 consists of short circuit analysis and power flow analysis. The TCS PH1 report preliminarily identifies: (1) equipment where short circuit capability limits or thermal or voltage ratings have been exceeded, and (2) Interconnection Facilities and Network Upgrades expected to be required to address those issues.

BPA performed the TCS PH1 by segmenting and studying the Interconnection Requests according to geographically and electrically relevant areas on BPA's Transmission System; those segments are identified as Cluster Areas. BPA identified plans of service for a subset of Interconnection Requests within a Cluster Area in some instances, identified as Scalable Plan Blocks. Cost and timeframe estimates for plans of service identified in this report are non-binding good faith estimates. Costs are allocated amongst Interconnection Requests as outlined in Section 4.2.3 of the LGIP.

3 Disclaimers

This document contains the technical study results of an evaluation of the impact of all proposed Interconnection Requests in the Cluster Area on the reliability of BPA's Transmission System. The TCS PH1 evaluates providing Interconnection Service, meaning the service provided by BPA to interconnect a Large Generating Facility to BPA's Transmission System to enable BPA's Transmission System to receive energy and capacity from the Large Generation Facility at the Point of Interconnection. The study results reflect evaluation of providing Energy Resource Interconnection Service to all Interconnection Requests, allowing each Large Generating Facility to connect and be eligible to deliver output on an "as available" basis up to the requested MWs of Interconnection Service. The interconnection process for Large Generating Facilities does not evaluate the requirements or potential impediments to providing transmission of the electrical output of a Large Generating Facility beyond the Point of Interconnection. A customer that wishes to obtain the right to deliver or inject energy from a Large Generating Facility beyond the Point of Interconnection must take a separate action to obtain transmission delivery service under BPA's OATT. The provision of Point-to-Point Transmission Service or Network Integration Transmission Service may require the construction of additional transmission equipment and facilities.

In addition, the technical studies results do not address generator balancing services that may be required to interconnect a Large Generating Facility to BPA's Transmission System.

These studies were conducted using the best available information at the time of the study. Findings and recommendations are based on information and assumptions that could



change. BPA reserves the right to add, delete, or modify any content in this report if new information is provided.

Additional Disclaimers

- 1) A customer's inclusion of an optional requested POI on a Transition Request does not guarantee that the customer's request was studied for interconnection at that POI. BPA, in its sole discretion, determined the POI for each Large Generating Facility to improve the reliability benefits, cost and/or benefits of the interconnection for the Cluster Area.
- 2) Energy storage grid charging is defined for this study as importing energy from beyond the POI to the IR storage device. This study evaluates grid charging where elected by each IR, but does not assess all resultant Transmission System requirements beyond the POI. This study presumes that energy storage grid charging connected to BPA's Transmission System will be treated as a generator (not a load) in context of expected transmission curtailments, expected transmission operating limits, or generation tripping RAS.
- 3) The TCS PH1 does not include the following analyses, which will be provided in the Transition Cluster Study Phase Two Cluster Study or Interconnection Facilities Study:
 - a) Provision of Network Resource Interconnection Service (NRIS);
 - b) Voltage & Transient Stability studies;
 - c) Electromagnetic Transient (EMT) studies; and
 - d) Fault Duty studies for detailed equipment sizing.
- 4) In electing to participate in the TCS, all customers attested that the Generating Facility proposed in a Transition Request would be designed to meet the BPA Transmission Standard "*Technical Requirements for Interconnection to the BPA Transmission Grid*" (STD-N-000001) posted to the BPA Interconnection webpage.
- 5) Any plan of service identified in this study report that would require access and usage of property associated with the Northwest AC Intertie (NWACI) to construct may require the consent of all owners of NWACI facilities to proceed and be beyond BPA's ability to grant. BPA will continue to study this plan of service but cannot guarantee that the Large Generating Facility may be interconnected under that plan of service.
 - i) As noted above, the TCS PH1 does not evaluate requirements or potential impediments to providing transmission delivery service. Any plan of service identified in this study report that would provide electrical connectivity between a Large Generating Facility and a NWACI facility does not provide the customer any right or ability to obtain transmission delivery service on a NWACI facility.

4 Study Assumptions

4.1 General Assumptions

BPA Transmission uses PowerWorld for positive sequence analysis (CTG Tool add-on, ATC Tool add-on, PV/QV Tool add-on, Transient Stability Tool add-on).

For TCS-PH1, "MW injection limit" tests are applied at each POI, to determine IR's MW thresholds at which a steady state system limiter occurs and requires mitigation. Injection limits



are also applied in the reverse direction, at POIs that have requested Battery Energy Storage System (BESS) grid charging. PowerWorld's ATC Tool is used to conduct these injection limit tests.

All analysis presumes Energy Resource Interconnection Service (ERIS) only. BPA Planning presumes IRs are not all dispatched simultaneously. Generally, BPA Planning only presumes IRs are dispatched simultaneously when at most one to two Bulk Electric System (BES) nodes away from the POI under study.

The TCS PH1 assumes all Generating Facilities studied are designed to the standards in STD-N-000001 at the time of publication of this report. Adherence to BPA STD-N-000001 includes many detailed requirements covering but not limited to minimum BPA communications network transport; BPA control system hardware; participation in BPA RAS; protective relaying; disturbance monitoring; scheduling and metering; voltage control; frequency response; reactive power quality; and more.

4.2 Senior-Queued IRs and non-BPA IRs

The following list of IRs were deemed impactful and senior to the Cluster Area and were assumed to be dispatched online for the TCS PH1. The list includes Interconnection Requests that were not subject to Attachment R of BPA's OATT (Bypass IRs), Late-Stage Projects that were eligible and elected to proceed serially, and non-BPA queued IRs in adjacent Transmission Provider queues if known. Where applicable, these senior-queued resources were dispatched online as starting assumptions.

Table 4.2: Senior-Queued IRs Assumed In-Service

Queue #	POI (owner)	MW Generating	MW Grid-Charging	Fuel Type
G0285	Central Ferry 230 kV (BPA)	250	0	Wind
G0295	Central Ferry 230 kV (BPA)	250	0	Wind
G0362	UEC Bluebridge 230 kV (UEC)	204	0	Wind
G0363	UEC Bluebridge 230 kV (UEC)	204	0	Wind
G0435	Longhorn 500 kV (BPA)	238	0	Wind
G0478	Longhorn 500 kV (BPA)	500	0	Wind
G0635	Bofer Canyon 115 kV (BPA)	100	0	Wind
G0671	Ninemile 69 kV (BPA)	200	0	Wind
G0678	UEC Bluebridge 230 kV (UEC)	1200	0	Solar/BESS
G0684	Wautoma 500 kV (BPA)	1560	0	Solar
G0686	Benton 115 kV (BPA)	128	0	Solar
G0691	Bofer Canyon 115 kV (BPA)	0	0	Solar
G0706	Grassland 500 kV (PGE)	100	0	Solar
G0713	Grassland 500 kV (PGE)	100	0	Solar
G0716	Webber Canyon 500 kV (BPA)	100	0	Solar
G0721	Bofer Canyon 115 kV (BPA)	0	0	Wind
G0733	Webber Canyon 500 kV (BPA)	30	0	BESS
G0734	Bofer Canyon 115 kV (BPA)	20	0	BESS



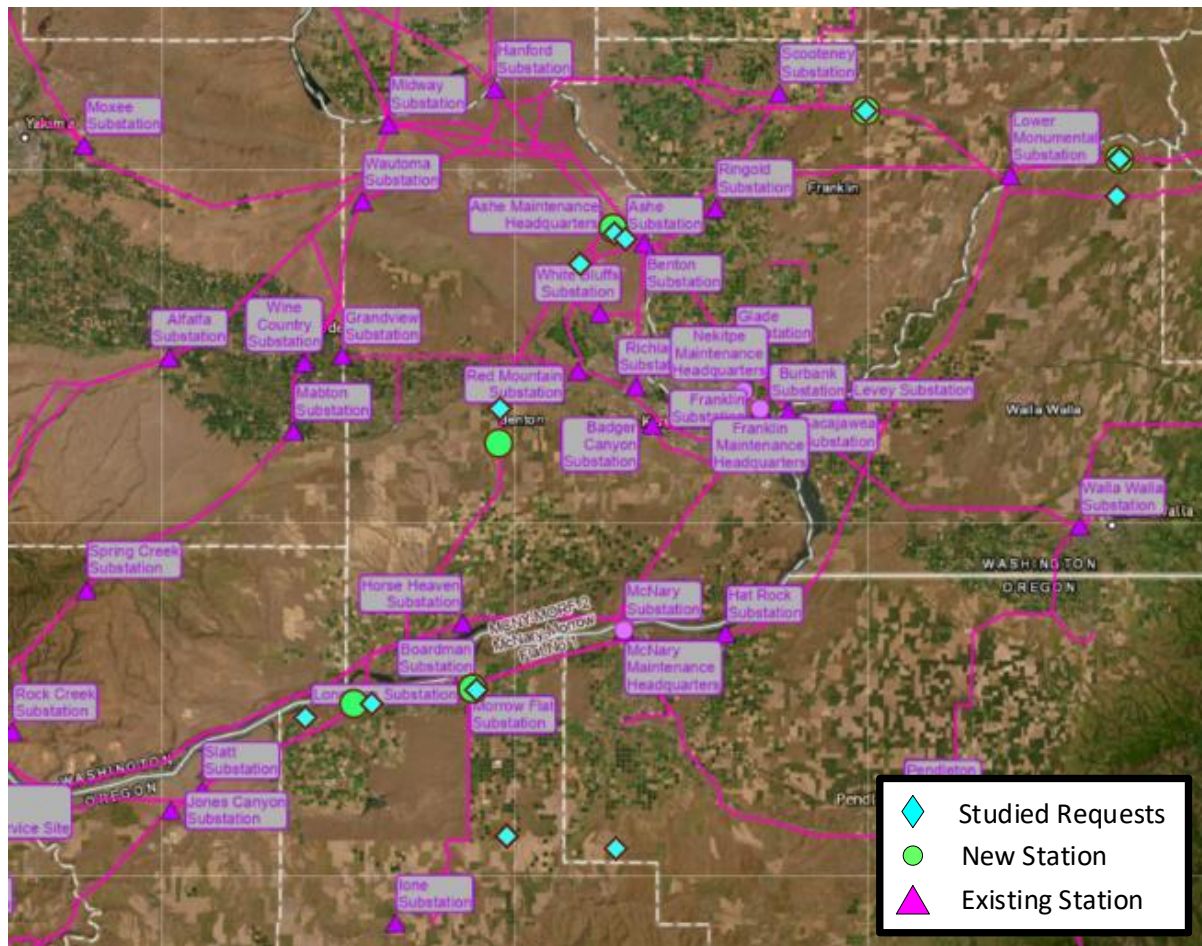
4.3 Communications and Control Capability (C&C)

1. All POI stations are capable of BPA Main Grid Remedial Action Scheme (RAS) participation. There is WECC-Class 1 communications (fully redundant, alternately routed) to each generation facility where the Main Grid RAS Generation Dropping (GD) will occur.
2. All POI stations have:
 - a. BPA SCADA Control & Indication
 - b. Transfer Trip or Current Differential protective relaying on all gen-ties from BPA station to customer station
 - c. Control Phasor Measurement Units (CPMUs)
 - d. Revenue Metering and telemetry for each IR

5 Study Methodology

5.1 Cluster Area Definition

The following map illustrates the geographic coordinates for the IRs assessed in Cluster Area TU1.



5.2 Studied POIs

The following table indicates the POI studied for each request in the Cluster Area.

Table 5.2: Studied POI locations

GI #	Gen Type	MW Requested (gen)	MW Requested (charging)	Studied POI
G0822	Solar/BESS	2000	-2000	Ashe 500 kV
G0919	Steam/Nuclear	220	0	Ashe 500 kV
G0998	Steam/Nuclear	960	0	Ashe 500 kV
G0908	Solar/BESS	0	-200	UEC Blueridge 230 kV
G0752	Solar/BESS/Gas	340	-330	Longhorn 500 kV
G0923	Solar/Wind/BESS	100	-100	New Little Goose-Lower Monumental #2 500 kV
G0924	Solar/Wind/BESS	100	-100	New Little Goose-Lower Monumental #2 500 kV
G0925	Solar/Wind/BESS	100	-100	New Little Goose-Lower Monumental #2 500 kV
G0935	Solar	225	0	New Little Goose-Lower Monumental #2 500 kV
G1015	Solar	270	0	New Lower Monumental-Hanford 500 kV
G0708	BESS	0	-60	Sixmile Canyon 230 kV
G0944	Solar	261	0	Sixmile Canyon 230 kV
G0777	Solar/BESS	650	-650	Sixmile Canyon 500 kV
G0963	BESS	650	-650	Sixmile Canyon 500 kV
G0920	Solar/BESS	500	-300	Webber Canyon 500 kV

5.3 Starting Base Cases

The following WECC Cases were used for Cluster Area TU1.

- 2030 Heavy Summer (HS)—peak load
- 2026 Light Spring (LSP)—off-peak load

Cases were modified to include applicable senior-queued IR POIs and their associated Plans of Service as reported in their associated System Impact or Facility study reports published on the host utility's OASIS.

In addition, select planned BPA Projects were modeled as senior to the TCS and impactful to the POI performance. Impactful topology additions for Cluster Area TU1 include:

- Longhorn to Hemingway 500 kV transmission line - B2H (IPC/PAC)
- Webber Canyon substation on Ashe-Marion #2 500 kV (BPA)
- Richland – Stevens Drive Reinforcement (BPA)
- Sacajawea tap to Ice Harbor – Franklin #1 115 kV transmission line (BPA)
- Coyote Springs Substation CT Replacements (BPA)

Additional summary of significant projects deemed Contingent Facilities and assumed in-service as base-state for this Cluster Area are specified in section 6.



5.3.1 Load and Resource Scenario Descriptions

High West of Lower Monumental and High West of McNary scenarios were created in the 2030HS and 2026LSP cases. To achieve these scenarios load assumptions at McNary, Longhorn, and Sixmile Canyon were adjusted between a high growth and intermediate growth projection. In addition, wind, hydro, and thermal resources in the area were adjusted.

5.4 Phase 1 POI Injection Tests

Steady state contingency analysis was conducted at each POI injecting total generating or grid-charging amounts, in queue order. Output at each POI was sunk to the following power flow buses, split equally among each bus:

<u>Bus Number</u>	<u>Bus Name</u>
41007	SNO_KING
40693	MAPLE_VA
40869	RAVER
40821	PAUL
40827	PEARL
40809	OSTRANDER
40687	MALIN
40045	ALLSTON
40601	KEELER

For charging simulations at each POI, sources were assumed at the above buses, split equally among each bus. Detailed findings of these injection tests can be found in the Results Section.

5.5 Phase 1 POI Short Circuit Ratio Strength Tests

Per BPA STD-N-000001, all LIR POIs shall have Short Circuit Ratio (SCR) of 3 or greater for all critical NERC TPL-001 P1 conditions.

All POIs evaluated for TU1 passed BPA's SCR strength test with the prescribed plans of service. This means that no Plan of Service elements are driven solely by the SCR test.

6 Contingent Facilities Assumed In-Service

6.1 Contingent Facilities

The following table summarizes projects assumed to be in-service as part of the TU1 cluster study. Projects deemed to be Contingent Facilities for this study are required to be energized prior to IRs at associated POIs taking Interconnection Service.



Table 6.1: Contingent Facilities Summary

Project Name	Affected POIs	Driver	Estimated Cost	Estimated I/S Date
Sixmile Canyon Substation	Sixmile Canyon 500 kV, Sixmile Canyon 230 kV	L0510	\$300M	Fall 2027
Webber Canyon Substation	Webber Canyon 500 kV	Internal BPA	\$300M	Spring 2029
Stanfield Substation	Stanfield 230 kV	L0585	\$300M	Fall 2030

7 Technical Analysis & Study Results

7.1 POI – Ashe 500 kV

TCS System Performance

Table 7.1: Results for POI – Ashe 500 kV

POI MW Thresholds	IRs Affected	Limiter (Element and TPL-001 Contingency Category)	Mitigation
-2000 to -1361	G0822, G0919 G0998	Lower Monumental – Sacajawea #1 500 kV, TPL-001 P1	Lower Monumental – Stanfield 500 kV Reinforcement, BPA RAS Participation (South of Ashe, West of Slatt, West of Lomo)
-1360 to 460	G0822	No limiter	N/A
461 to 3180	G0822, G0919 G0998	Lower Monumental – Sacajawea #1 500 kV, TPL-001 P7	Lower Monumental – Stanfield 500 kV Reinforcement, RAS Participation (South of Ashe, West of Slatt, West of Lomo)

Proposed Mitigations

460 MW of generation and 1360 MW of grid-charging can be interconnected at Ashe 500 kV without reinforcement. Generating more than 460 MW or grid-charging more than 1360 MW at Ashe 500 kV requires mitigation with a new 75-mile Lower Monumental – Stanfield 500 kV transmission line (parallel to the existing Lower Monumental-McNary 500 kV line).

BPA interconnection requirements state that a Most Severe Single Contingency (MSCC) generator resource loss shall not exceed 1,500 MW. Multiple gen-tie lines from the BPA POI substation to customer station will be required for plants larger than 1,500 MW.

All generators must participate in existing and new BPA RAS near Lower Monumental (West of Lomo, South of Ashe).

7.2 POI – Lower Monumental – Hanford #1 500 kV

TCS System Performance

Table 7.2: Results for POI – Lower Monumental – Hanford #1 500 kV

POI MW Threshold	IRs Affected	Limiter (Element and TPL-001 Contingency Category)	Mitigation
0 to 270	G1015	No Limiter	BPA RAS Participation (West of Lomo, South of Ashe)



Proposed Mitigations

270 MW of generation can be interconnected on Lower Monumental – Hanford #1 500 kV without mitigation.

All generators must participate in existing and new BPA RAS near Lower Monumental (West of Lomo, South of Ashe).

7.3 POI – Little Goose – Lower Monumental #2 500 kV*TCS System Performance*

Table 7.3: Results for POI – Little Goose – Lower Monumental #2 500 kV

POI MW Threshold	IRs Affected	Limiter (Element and TPL-001 Contingency Category)	Mitigation
0 to 235	G0923, G0924, G0925	None	N/A
236 to 525	G0925 (partial), G0926	Lower Monumental – Sacajawea #1 500 kV, TPL-001 P7	Lower Monumental – Stanfield 500 kV Reinforcement, BPA RAS Participation (West of Lomo, South of Ashe)

Proposed Mitigations

235 MW of generation can be interconnected on Little Goose – Lower Monumental #2 500 kV without mitigation. Generating the full requested 525 MW on Little Goose – Lower Monumental #2 500 kV requires mitigation with a new Lower Monumental – Stanfield 500 kV line. No mitigation is required for 300 MW of charging.

All generators must participate in existing and new BPA RAS near Lower Monumental (West of Lomo, South of Ashe).

7.4 POI – Longhorn 500 kV*TCS System Performance*

Table 7.4: Results for POI – Longhorn 500 kV

POI MW Threshold	IRs Affected	Limiter (Element and TPL-001 Contingency Category)	Mitigation
-330 to -251	G0752	Lower Monumental – Sacajawea #1 500 kV, TPL-001 P7	Lower Monumental – Stanfield 500 kV Reinforcement
-250 to 340	G0752	None	N/A

Proposed Mitigations

340 MW of generation and 250 MW of charging can be interconnected at Longhorn 500 kV without reinforcement. Grid-charging more than 250 MW at Longhorn 500 kV requires a new 75-mile Lower Monumental – Stanfield 500 kV line.



7.5 POI – Sixmile Canyon 500 kV

TCS System Performance

Table 7.5: Results for POI – Sixmile Canyon 500 kV

POI MW Threshold	IRs Affected	Limiter (Element and TPL-001 Contingency Category)	Mitigation
-1300 to 1300	G0777, G0963	None	RAS Participation (West of Slatt, South of Ashe)

Proposed Mitigations

1300 MW of generation and 1300 MW of grid-charging can be interconnected at Sixmile Canyon 500 kV without additional reinforcements. All generators must participate in existing and new BPA RAS near Slatt (West of Slatt, South of Ashe).

7.6 POI – Sixmile Canyon 230 kV

TCS System Performance

Table 7.6: Results for POI – Sixmile Canyon 230 kV

POI MW Threshold	IRs Affected	Limiter (Element and TPL-001 Contingency Category)	Mitigation
-60 to 261	G0708, G0944	None	RAS Participation (West of Slatt, South of Ashe)

Proposed Mitigations

261 MW of generation and 60 MW of grid-charging can be interconnected without additional reinforcements. All generators must participate in existing and new BPA RAS near Slatt (West of Slatt, South of Ashe).

7.7 POI – Webber Canyon 500 kV

TCS System Performance

Table 7.7: Results for POI0 – Webber Canyon 500 kV

POI MW Threshold	IRs Affected	Limiter (Element and TPL-001 Contingency Category)	Mitigation
-300 to 500	G0920	Webber Canyon 500 kV single line losses	RAS Participation (WEBC local RAS, South of Ashe)

Proposed Mitigations

Existing RAS algorithms at Webber Canyon trip generation for loss of 500 kV circuits. Any amount of generation or grid-charging from this POI will require participation in this RAS.

7.8 POI – UEC Blueridge 230 kV

TCS System Performance

Table 7.8: Results for POI2 – UEC Blueridge 230 kV

POI MW Threshold	IRs Affected	Limiter (Element and TPL-001 Contingency Category)	Mitigation
-200 to 0	G0908	Longhorn 500/230 kV bank	RAS Participation (Local Longhorn)



Proposed Mitigations

There are senior queued IRs and LLIRs proposing new RAS for loss of the new Longhorn 500/230 transformers. Participation in this new RAS is required to enable any grid-charging amount at Blueridge 230 kV.

8 Affected System Impacts

The analysis of the proposed interconnections studied in this Cluster Area identified Adverse System Impacts on the Affected Systems identified below. The results of this study report will be shared with the Affected System Operator/s of those Affected System/s. The Affected System Operator/s identified below may determine whether a study is required and that actions are required on that Affected System to mitigate the impacts of the proposed interconnection on BPA's Transmission System. **Plans of service identified in this report may be modified or revised in response to an affected utility system study result.**

Affected System	Elements Impacted	POI (G#)
UEC	Blueridge 230	G0908

9 Interconnection Facility Requirements

9.1 POI – Ashe 500 kV

Table 9.1: POI – Ashe 500 kV Facility requirements

G#	BPA Station Work	BPA Non-Station Work
G0822	2x 500 kV gen-tie Terminals (1500 MW limit per terminal)	Lower Monumental – Stanfield 500 kV Reinforcement
G0919	None (MW uprate of existing generator turbine)	Lower Monumental – Stanfield 500 kV Reinforcement
G0998	1x 500 kV gen-tie Terminal	Lower Monumental – Stanfield 500 kV Reinforcement

1. Develop (2) 500 kV bays in breaker and a half configuration with (5) 500 kV power circuit breakers, (10) 500 kV disconnect switches and associated control, relaying and communication equipment.
2. Construct a new 500 kV line, Lower Monumental – Stanfield #1 500 kV (75mi).
3. P7 RAS participation for 500kV outages south of Ashe and west of Slatt.
4. Installation of BPA-required C&C equipment at customer's Collector sites (RAS, Meters, relays, Control House space)
 - a. G0822 assumes two sets of C&C equipment to support two BPA POI terminals
 - b. G0919 assumes no incremental C&C equipment (existing generator).
5. Minor development of C&C hardware at BPA's POI substation.

The customer will construct a 500 kV line from the BPA POI station to their generation facility. The customer will then construct a 500/34.5 kV substation directly adjacent to the POI line to support their 34.5 kV feeders at their collector site.



9.2 POI – Lower Monumental – Hanford #1 500 kV

Table 9.2: POI – Lower Monumental – Hanford #1 500 kV Facility requirements

G#	BPA Station Work	BPA Non-Station Work
G1015	500 kV Substation with terminals for Lower Monumental – Hanford #1 500 kV line, 1x 500 kV gen-tie Terminal	Lower Monumental – Stanfield 500 kV Reinforcement

1. Develop a new 500 kV, 2-bay, substation in breaker and a half configuration. Develop (2) 500 kV bays with (3) 500 kV power circuit breakers, (8) 500 kV disconnect switches and associated control, relaying and communication equipment.
2. Construct a new 500 kV line, Lower Monumental – Stanfield #1 500 kV (75mi).
3. Installation of BPA-required C&C equipment at customer's Collector sites (RAS, Meters, relays, Control House space)
4. Minor development of C&C hardware at BPA's POI substation.

The customer will construct a 500 kV line from the BPA POI station to their generation facility. The customer will then construct a 500/34.5 kV substation directly adjacent to the POI line to support their 500 kV feeders at their collector site.

9.3 POI – Little Goose – Lower Monumental #2 500 kV

Table 9.3: POI – Little Goose – Lower Monumental #2 500 kV Facility requirements

G#	BPA Station Work	BPA Non-Station Work
G0923, G0924, G0925, G0935	500 kV Substation with terminals for Little Goose – Lower Monumental #2 500 kV line, 1x 500 kV shared gen-tie Terminal	Lower Monumental – Stanfield 500 kV Reinforcement

1. Develop a new 500 kV, 2-bay, substation in breaker and a half configuration. Develop (2) 500 kV bays with (3) 500 kV power circuit breakers, (8) 500 kV disconnect switches and associated control, relaying and communication equipment.
2. Construct a new 500 kV line, Lower Monumental – Stanfield #1 500 kV (75mi).
3. Installation of BPA-required C&C equipment at customer's Collector sites (RAS, Meters, relays, Control House space)
4. Minor development of C&C hardware at BPA's POI substation.

The customer will construct a 500 kV line from the BPA POI station to their generation facility. The customer will then construct a 500/34.5 kV substation directly adjacent to the POI line to support their 34.5 kV feeders at their collector site.

9.4 POI – Longhorn 500 kV

Table 9.4: POI – Longhorn 500 kV Facility requirements

G#	BPA Station Work	BPA Non-Station Work
G0752	1x 500 kV gen-tie Terminal	Lower Monumental – Stanfield 500 kV Reinforcement



1. Develop (1) 500 kV bay in breaker and a half configuration with (2) 500 kV power circuit breakers, (4) 500 kV disconnect switches and associated control, relaying and communication equipment.
2. Construct a new 500 kV line, Lower Monumental – Stanfield #1 500 kV (75mi).
3. Installation of BPA-required C&C equipment at each customer's Collector site (RAS, Meters, relays, Control House space)
4. Minor development of C&C hardware at BPA's POI substation.

The customer will construct a 500 kV line from the BPA POI station to their generation facility. The customer will then construct a 500/34.5 kV substation directly adjacent to the POI line to support their 34.5 kV feeders at their collector site.

9.5 POI – Sixmile Canyon 500 kV

Table 9.5: POI – Sixmile Canyon 500 kV Facility requirements

G#	BPA Station Work	BPA Non-Station Work
G0777, G0963	1x 500 kV shared gen-tie Terminal	N/A

1. Develop (1) 500 kV bay in breaker and a half configuration with (2) 500 kV power circuit breakers, (4) 500 kV disconnect switches and associated control, relaying and communication equipment.
1. Installation of BPA-required C&C equipment at each customer's Collector site (RAS, Meters, relays, Control House space)
2. Minor development of C&C hardware at BPA's POI substation.

The customer will construct a 500 kV line from the BPA POI station to their generation facility. The customer will then construct a 500/34.5 kV substation directly adjacent to the POI line to support their 34.5 kV feeders at their collector site.

9.6 POI – Sixmile Canyon 230 kV

Table 9.6: POI – Sixmile Canyon 230 kV Facility requirements

G#	BPA Station Work	BPA Non-Station Work
G0708, G0944	1x 230 kV shared gen-tie Terminal	N/A

1. Develop (1) 230 kV bay in breaker and a half configuration with (2) 230 kV power circuit breakers, (4) 230 kV disconnect switches and associated control, relaying and communication equipment.
2. Installation of BPA-required C&C equipment at customer's Collector sites (RAS, Meters, relays, Control House space)
3. Minor development of C&C hardware at BPA's POI substation.



The customer will construct a 230 kV line from the BPA POI station to their generation facility. The customer will then construct a 230/34.5 kV substation directly adjacent to the POI line to support their 34.5 kV feeders at their collector site.

9.7 POI – Webber Canyon 500 kV

Table 9.7: POI – Webber Canyon 500 kV Facility requirements

G#	BPA Station Work	BPA Non-Station Work
G0920	C&C, for Collector & POI (shared gen-tie with senior G0558)	N/A

1. Develop half of one 500 kV bay with (1) 500 kV power circuit breakers, (3) 500 kV disconnect switches and associated control, relaying and communication equipment.
2. Participation in load drop RAS
3. Installation of BPA-required C&C equipment at customer's Collector site (RAS, Meters, relays, Control House space)
4. Minor development of C&C hardware at BPA's POI substation.

9.8 POI – UEC Blueridge 230 kV

Table 9.8: POI – UEC Blueridge 230 kV Facility requirements

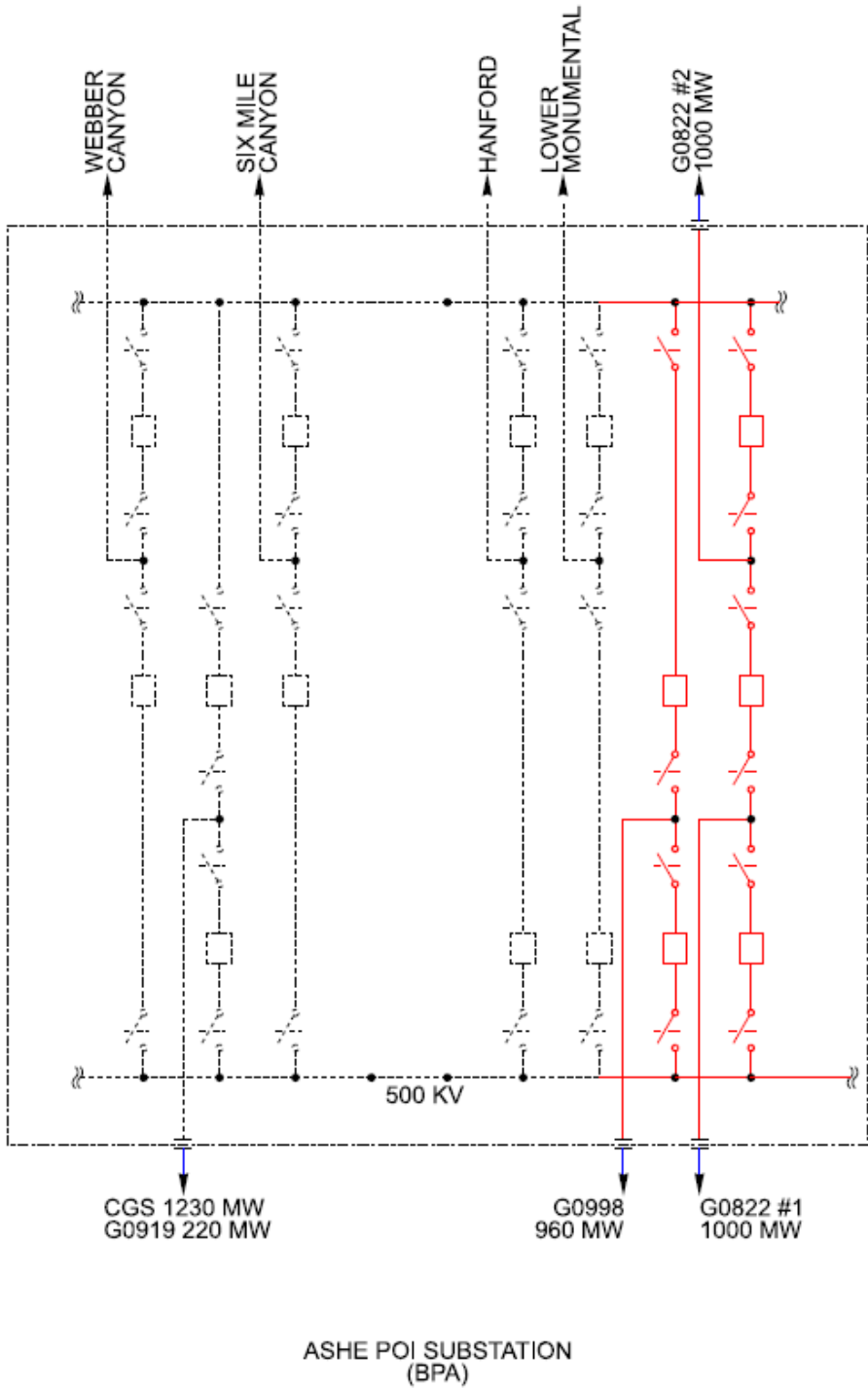
G#	BPA Station Work	BPA Non-Station Work
G0908	C&C, for Collector & POI	N/A

1. Installation of required control, relaying, and communications equipment.
2. Participation in load drop RAS
3. Installation of BPA-required C&C equipment at customer's Collector sites (RAS, Meters, relays, Control House space)



10 Project One-Line Drawings

10.1 POI – Ashe 500 kV



LEGEND

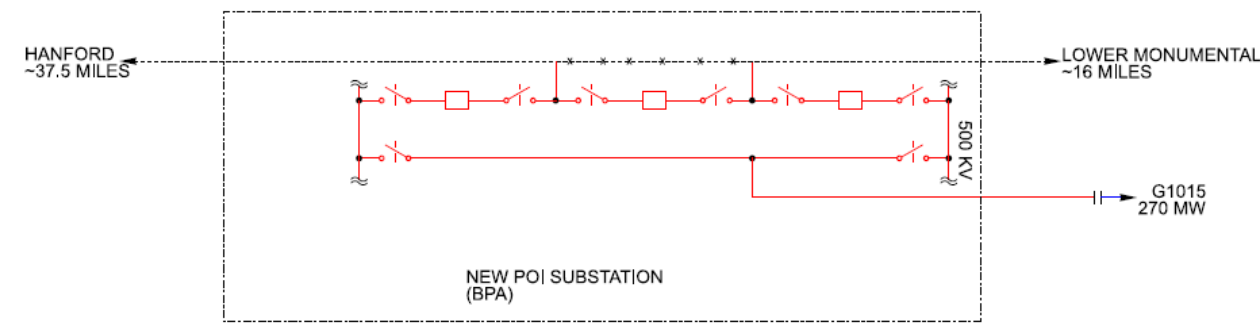
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- THIS PROJECT-CUSTOMER
- EXISTING-BPA
- BOUNDARY LINE
- CHANGE OF OWNERSHIP
- TO BE REMOVED

PROJECT REQUIREMENTS DIAGRAM								
UNITED STATES DEPARTMENT OF ENERGY BONNEVILLE POWER ADMINISTRATION PORTLAND, OREGON								
ENERGIZATION DATE(S) 1 OCT 20XX		OPERATIONS & PLANNING						
PRELIMINARY APPROVAL		DATE		ASHE 500 KV POI				
COORDINATING ENGINEER DAVID CATHCART								
FINAL APPROVAL		DATE		SERIAL	SOURCE	SIZE	SHEET	F
				PH1CS 20	TP	D	1 of 1	

PHASE 1



10.2 POI – Lower Monumental – Hanford #1 500 kV



LEGEND

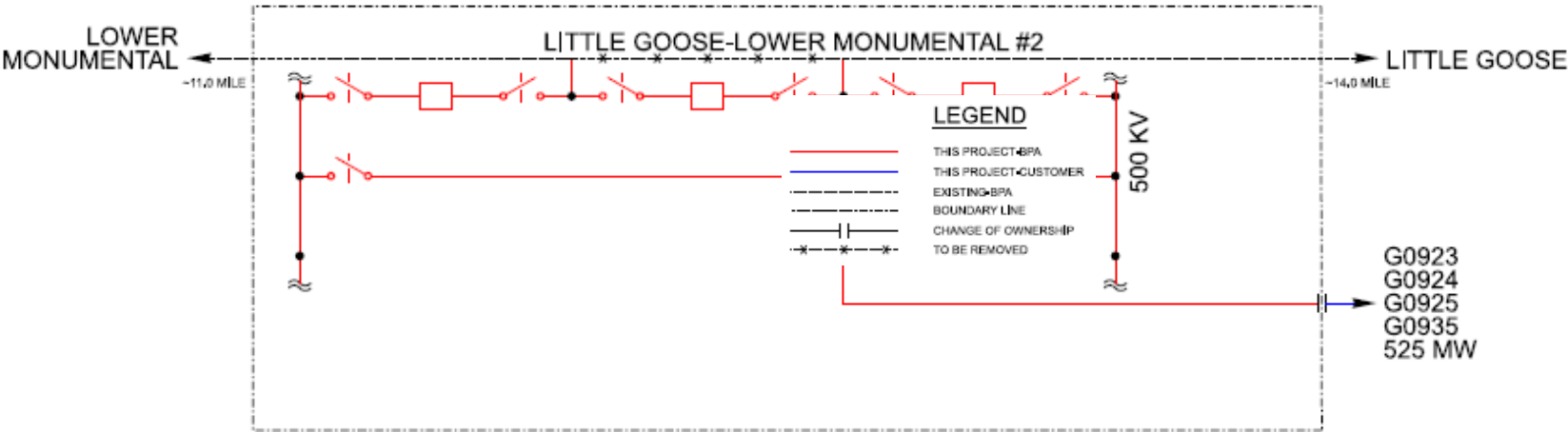
- THIS PROJECT-BPA
- THIS PROJECT-CUSTOMER
- EXISTING-BPA
- BOUNDARY LINE
- CHANGE OF OWNERSHIP TO BE REMOVED

PHASE 1

PROJECT REQUIREMENTS DIAGRAM						
UNITED STATES DEPARTMENT OF ENERGY BONNEVILLE POWER ADMINISTRATION PORTLAND, OREGON						
ENERGIZATION DATE(S) 1 OCT 20XX		OPERATIONS & PLANNING				
PRELIMINARY APPROVAL DATE						
COORDINATING ENGINEER DAVID CATHCART		LOMO-HANF 500 KV POI				
FINAL APPROVAL DATE						
		SERIAL PH1CS 19	SOURCE TP	SIZE D	SHEET 1 of 1	REV 0

PHASE 1

10.3 POI – Little Goose – Lower Monumental #2 500 kV

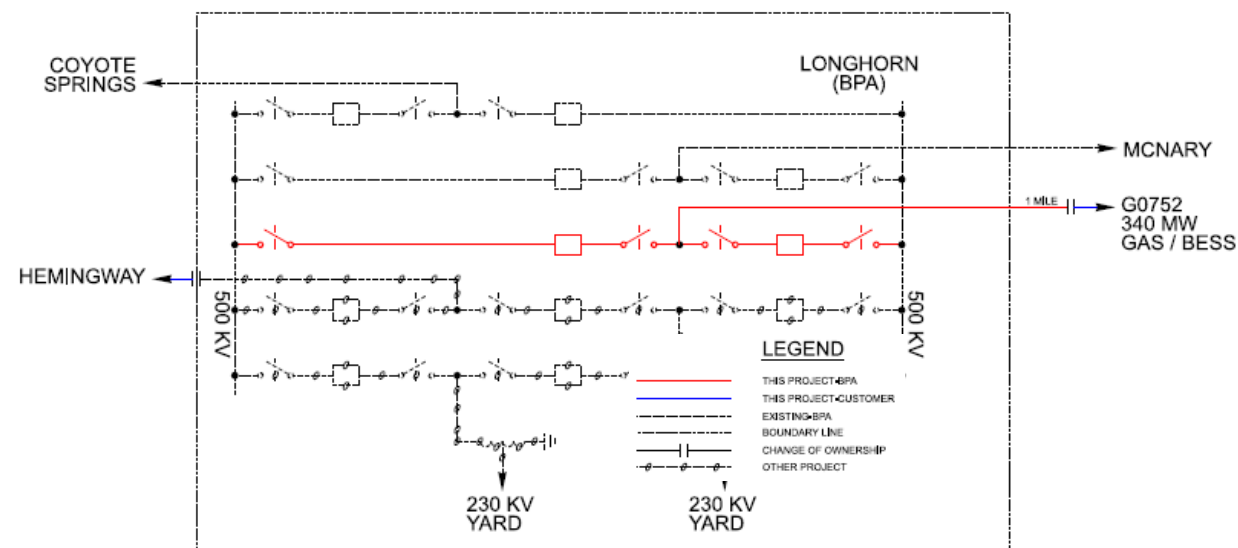


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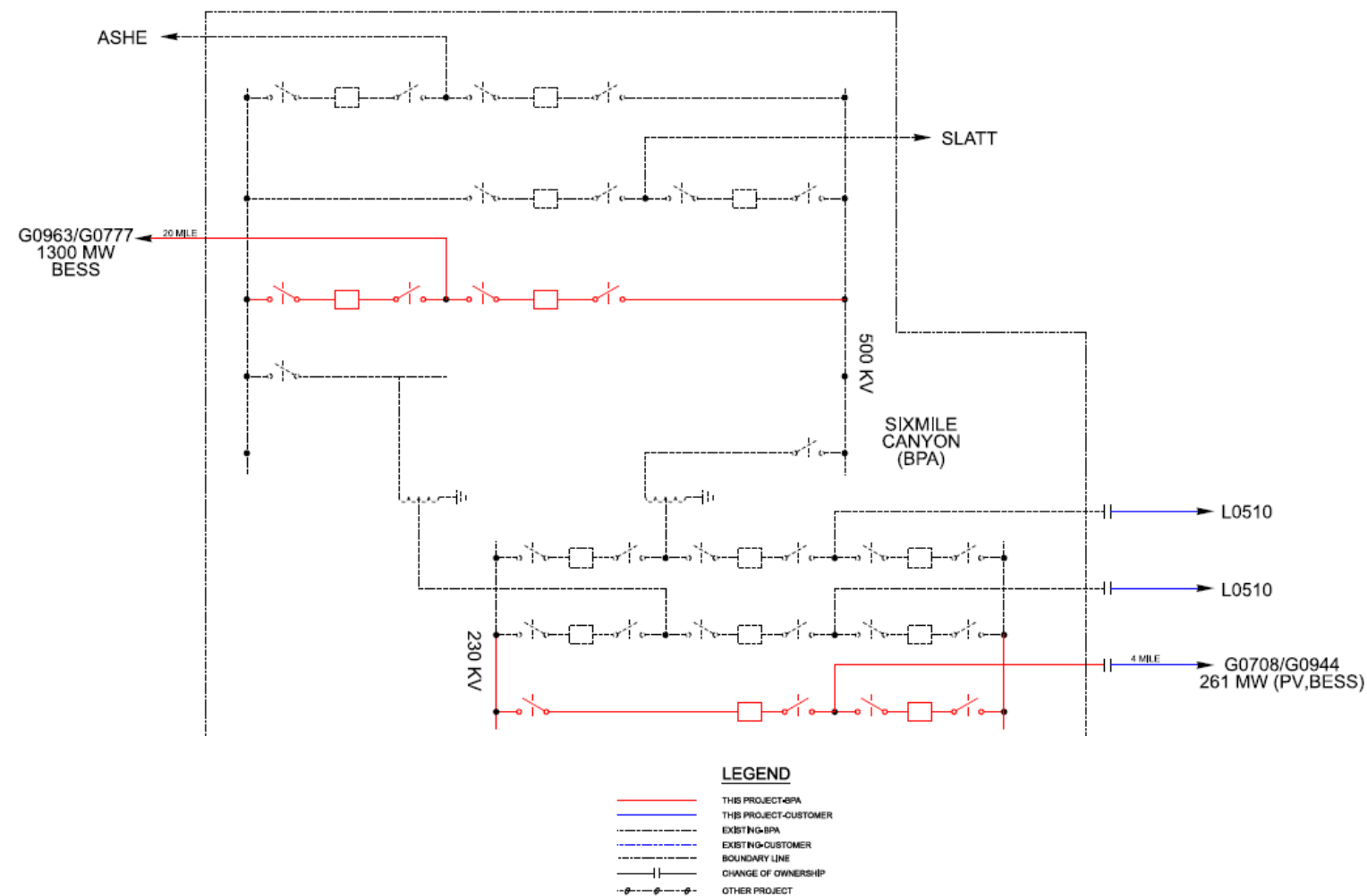
- THIS PROJECT-BPA
- THIS PROJECT-CUSTOMER
- EXISTING-BPA
- BOUNDARY LINE
- CHANGE OF OWNERSHIP TO BE REMOVED



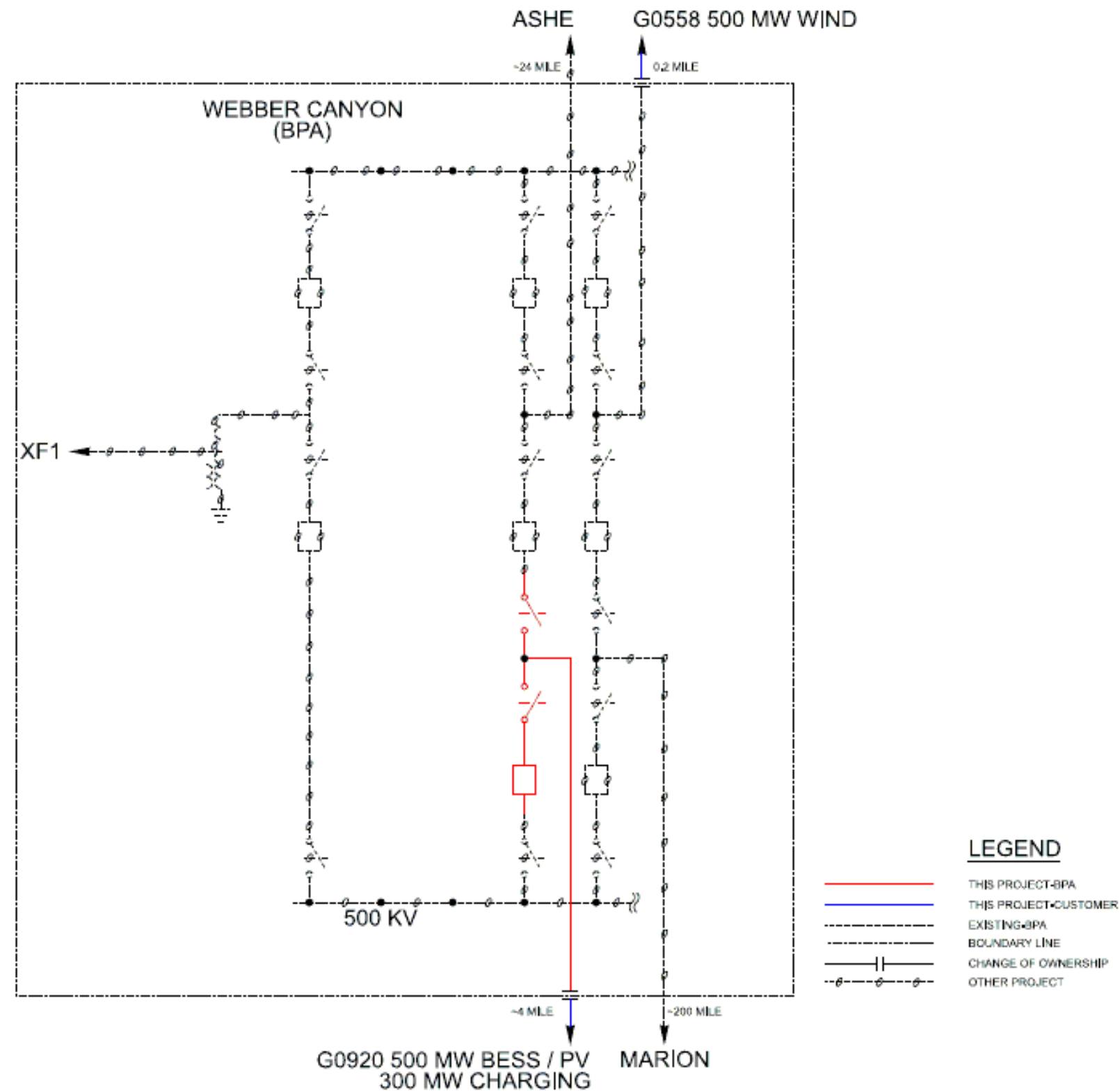
10.4 POI – Longhorn 500 kV



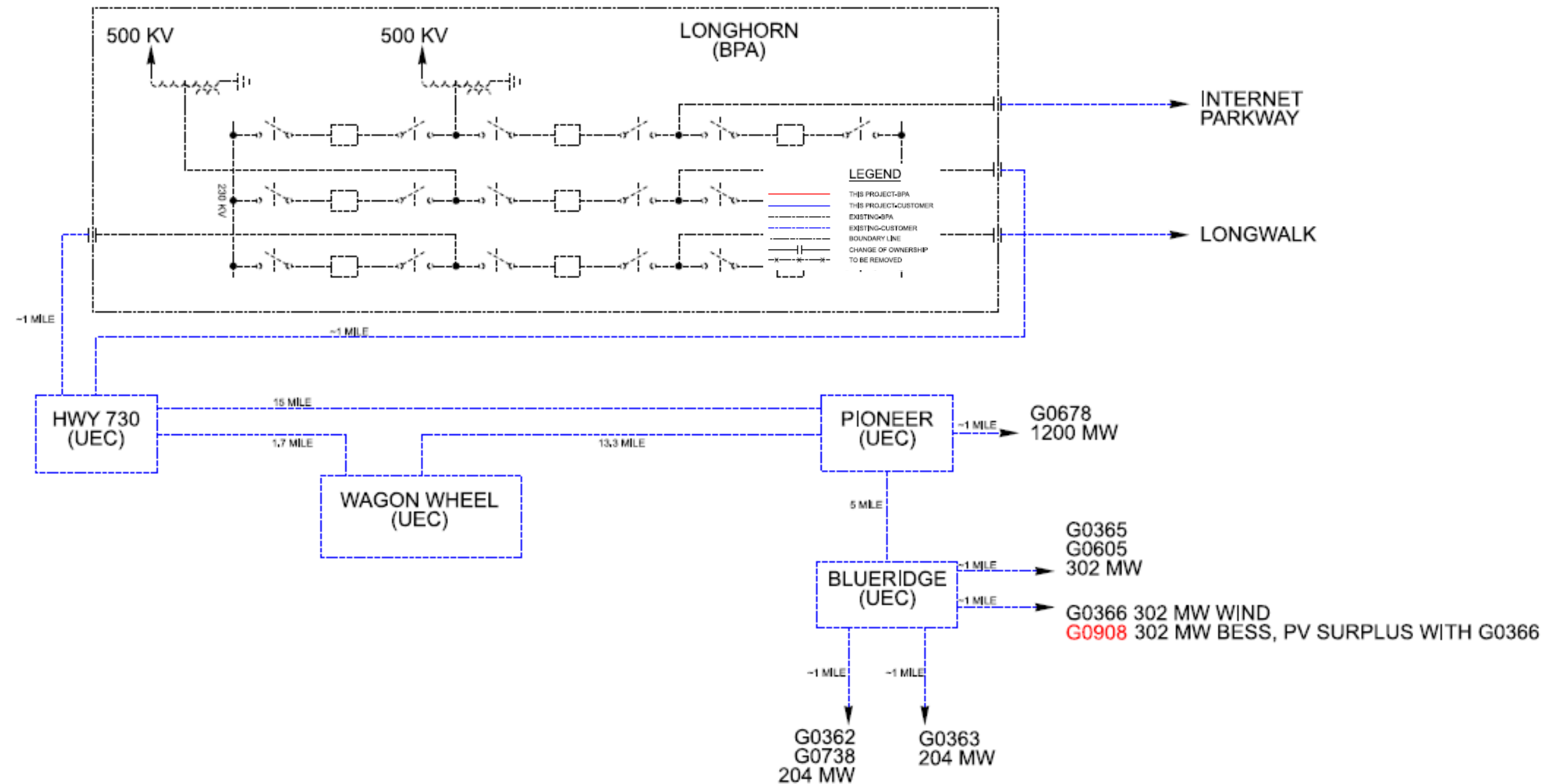
10.5 POIs– Sixmile Canyon 500kV and 230 kV



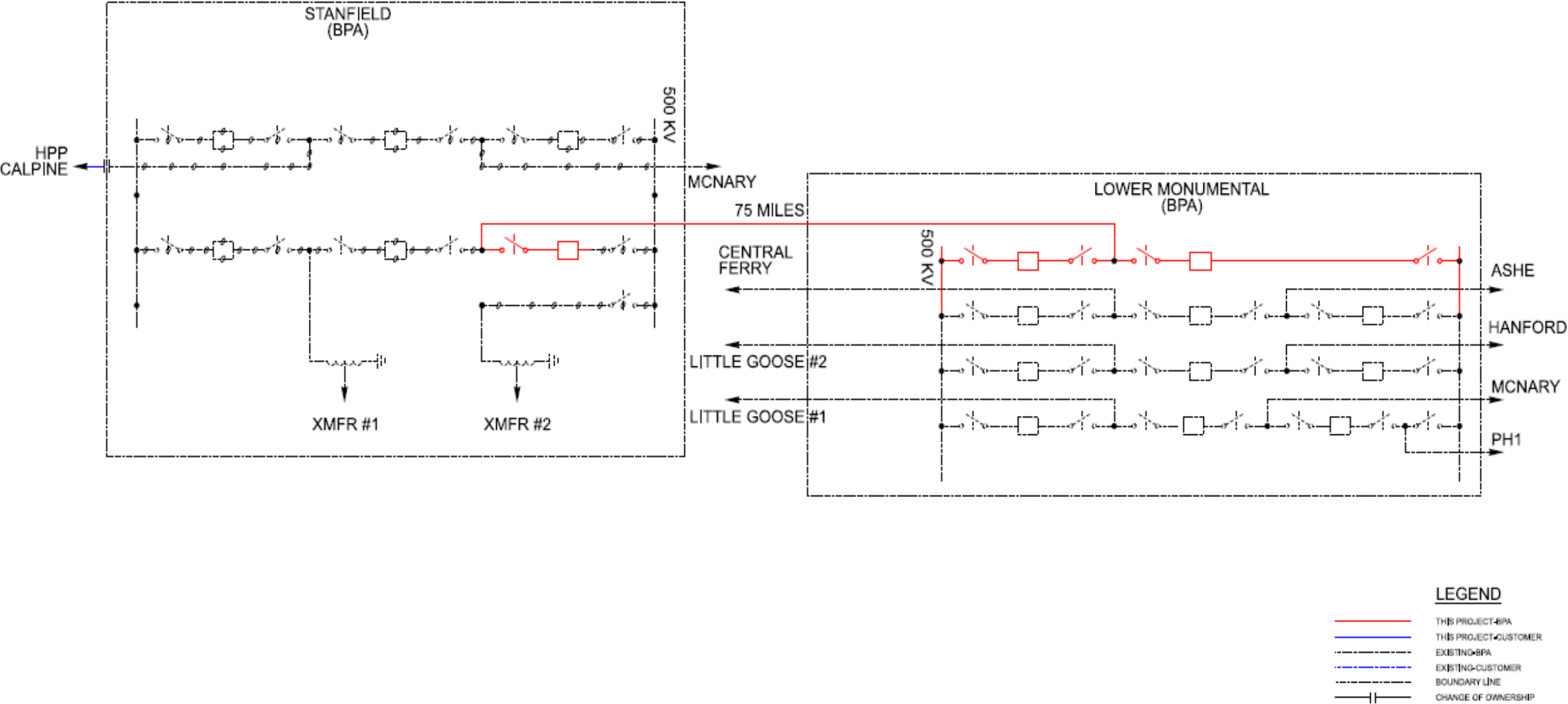
10.6 POI – Webber Canyon 500 kV



10.7 POI – UEC Blueridge 230 kV



10.8 SPB: Lower Monumental – Stanfield 500 kV Reinforcement



11 Cost and Schedules

11.1 Estimated Schedule

The schedule is dependent on,

- 1) The acquisition of long lead time equipment,
- 2) BPA's ability to fit the project into its construction work plan, and
- 3) The customer's ability to obtain any necessary permits for the project and progress through the interconnection process in a timely manner.

A non-binding good faith estimated time to construct is 3-5 years for substation equipment and 7-10 years for transmission line upgrades after design activities begin. The estimated time to construct a plan of service is refined through the subsequent stages of the interconnection process.

BPA will not begin construction of a plan of service required for interconnection until the Interconnection customer has executed a Standard Large Generator Interconnection Agreement (LGIA). BPA's decision to offer an LGIA is dependent on the completion of an environmental compliance decision under the National Environmental Policy Act (NEPA). BPA's environmental compliance decision under NEPA requires the Interconnection customer to have obtained required permitting, certification, and environmental approvals for any facilities that BPA will not own.

11.2 Cost Estimates and Cost Allocations

The following are non-binding good faith estimates of cost based on previous estimates for similar projects. They represent only scopes of work that will be performed by BPA. Costs for any work being performed by the customer are not included. These costs include overhead rates for BPA labor & materials, and for contract labor & materials. The costs also include a 40% contingency. Not included in these estimates are costs for land acquisition, permitting and environmental mitigations. More accurate estimates based on scoping for the project will be available at the completion of the Interconnection Facilities Study.

Detailed Communications and Control (C&C) equipment required for each generation facility and interconnection into the BPA transmission system at the BPA-TS POI substation will be determined in an Interconnection Facilities Study. The TCS PH1 estimates C&C equipment scope and costs based on whether required upgrades fall into the following categories:

- 1) customer station (\$5M): for BPA-required C&C equipment at a customer's collector site (RAS, Meters, relays, Control House space)
- 2) Minor (\$5M): BES additions to an existing BPA station
- 3) Moderate (\$10M): BES creation of a new BPA substation near existing C&C infrastructure, or significant expansion of an existing BPA substation
- 4) Significant (\$15M): BES creation of BPA substation very remote from any existing C&C infrastructure.

When multiple projects owned by affiliated entities interconnected at the same POI, BPA assumed the IRs to be sharing a tie line where applicable. These IRs were treated as a single customer for per capita cost allocation of station equipment Network Upgrades as outlined in



Section 4.2.3(a) of the LGIP. In the below cost estimate tables, this treatment is identified by the senior-queued IR being allocated the full per capita cost share and the junior-queued IR being allocated 0% of costs for station equipment Network Upgrades. IRs assumed to be sharing a tie line are identified in the one-line drawings provided in section 10 of this report.



11.3 POI – Ashe 500 kV

Table 11.1 POI – Ashe 500 kV Station Cost Estimate 1 (G0822)

Estimate Summary									Ashe 500 kV POI 1 (G0822 station costs)								
Estimate #	Description			Quantity	Contract		BPA		Misc.	Total							
					Labor	Material	Labor	Material									
	LOCATION #1			-	-	-	-	-	-	-							
ST-070-65-10	500kV Add: 1x bay 2pos BAAH			1	\$11,708,000	\$9,614,000	\$1,810,000	\$0	\$58,000	\$23,190,000							
Collector C&C	Collector Station C&C			1	\$0	\$0	\$0	\$0	\$5,000,000	\$5,000,000							
POI C&CS	BPA POI Station C&C			0.5	\$0	\$0	\$0	\$0	\$2,500,000	\$2,500,000							
Contingency %	40%			Subtotal:	\$11,708,000	\$9,614,000	\$1,810,000	\$0	\$7,558,000	\$30,690,000							
Overhead %	Labor		Materials & Turnkey	Contingency:	\$4,683,200	\$3,845,600	\$724,000	\$0	\$3,023,200	\$12,276,000							
	26%		9%	Overhead:	\$4,261,712	\$1,211,364	\$658,840	\$0	\$952,308	\$7,084,224							
Grand Total:	(rounded to two significant figures)				\$21,000,000	\$15,000,000	\$3,200,000	\$0	\$11,500,000	\$50,000,000							

Table 11.2 POI – Ashe 500 kV Station Cost Estimate 2 (G0998)

Estimate Summary									Ashe 500 kV POI 1 (G0998 station costs)								
Estimate #	Description			Quantity	Contract		BPA		Misc.	Total							
					Labor	Material	Labor	Material									
	LOCATION #1			-	-	-	-	-	-	-							
ST-070-65-10	500kV Add: 1x bay 2pos BAAH			0.66	\$7,727,280	\$6,345,240	\$1,194,600	\$0	\$38,280	\$15,305,400							
Collector C&C	Collector Station C&C			1	\$0	\$0	\$0	\$0	\$5,000,000	\$5,000,000							
POI C&CS	BPA POI Station C&C			0.5	\$0	\$0	\$0	\$0	\$2,500,000	\$2,500,000							
Contingency %	40%			Subtotal:	\$7,727,280	\$6,345,240	\$1,194,600	\$0	\$7,538,280	\$22,805,400							
Overhead %	Labor		Materials & Turnkey	Contingency:	\$3,090,912	\$2,538,096	\$477,840	\$0	\$3,015,312	\$9,122,160							
	26%		9%	Overhead:	\$2,812,730	\$799,500	\$434,834	\$0	\$949,823	\$4,996,888							
Grand Total:	(rounded to two significant figures)				\$14,000,000	\$9,700,000	\$2,100,000	\$0	\$11,500,000	\$37,000,000							



Table 11.3 POI – Ashe 500 kV Cost Allocation

Queue #	Requested MW	MW Split	Plan of Service	MW Enabled	Station Equipment Allocation (Per Capita)	Station Equipment Cost	Non-Station Equipment Allocation (Per MW)	Non-Station Equipment Cost	Non-Network Direct Assigned	Direct Assigned Cost	Cost Assignment
G0822	2000	460	Ashe 500kV Substation Expansion 1	460	100.00%	\$41M	N/A	N/A	Collector Station C&C and RAS	\$9M	\$317M
		1540	Ashe 500kV Substation Expansion 2	2720	0.00%	\$28M	45.970%	\$580M	N/A	N/A	
G0919	220	220	w/Expanded Comms		0.00%		6.567%		N/A	N/A	\$38M
G0998	960	960	SPB1: Lower Monumental - Stanfield 500kV Reinforcement		100.00%		28.657%		Collector Station C&C and RAS	\$9M	\$203M



11.4 POI – Lower Monumental – Hanford #1 500 kV

Table 11.4 POI – Lower Monumental – Hanford #1 500 kV Station Cost Estimate

<i>Estimate Summary</i>								
<i>Lower Monumental - Hanford #1 500 kV POI 2</i>								
Estimate #	Description	Quantity	Contract		BPA		Misc.	Total
			Labor	Material	Labor	Material		
	LOCATION #1	-	-	-	-	-	-	-
ST-070-133-7	500kV New POI: 4x PCB, 3pos, 2x bay BAAH	1	\$44,512,000	\$46,842,000	\$5,690,000	\$816,000	\$0	\$97,860,000
Collector C&C	Collector Station C&C	1	\$0	\$0	\$0	\$0	\$5,000,000	\$5,000,000
POI C&C S	BPA POI Station C&C	1	\$0	\$0	\$0	\$0	\$5,000,000	\$5,000,000
Contingency %	40%	Subtotal:	\$44,512,000	\$46,842,000	\$5,690,000	\$816,000	\$10,000,000	\$107,860,000
Overhead %	Labor	Contingency:	\$17,804,800	\$18,736,800	\$2,276,000	\$326,400	\$4,000,000	\$43,144,000
	26%	Overhead:	\$11,573,120	\$4,215,780	\$1,479,400	\$73,440	\$900,000	\$18,241,740
Grand Total:	<i>(rounded to two significant figures)</i>		\$74,000,000	\$70,000,000	\$9,400,000	\$1,220,000	\$15,000,000	\$170,000,000

Table 11.5 POI – Lower Monumental – Hanford #1 500 kV Station Cost Allocation

Queue #	Requested MW	Station Equipment	Station Equipment Allocation (Per Capita)	Station Equipment Cost	Non-Station Equipment	Non-Station Equipment Allocation	Non-Station Equipment Cost	Non-Network Direct Assigned	Direct Assigned Cost	Cost Assignment
G1015	270	New 500kV Substation w/ New Comms	100%	\$161M	N/A	N/A	N/A	Collector Station C&C and RAS	\$9M	\$170M



11.5 POI – Little Goose – Lower Monumental #2 500 kV

Table 11.6 POI – Little Goose – Lower Monumental #2 500 kV Station Cost Estimate

Estimate Summary		Little Goose - Lower Monumental #2 500 kV POI 3						
Estimate #	Description	Quantity	Contract		BPA		Misc.	Total
			Labor	Material	Labor	Material		
	LOCATION #1	-	-	-	-	-	-	-
ST-070-133-7	500kV New POI: 4x PCB, 3pos, 2x bay BAAH	1	\$44,512,000	\$46,842,000	\$5,690,000	\$816,000	\$0	\$97,860,000
Collector C&C	Collector Station C&C	4	\$0	\$0	\$0	\$0	\$20,000,000	\$20,000,000
POI C&C S	BPA POI Station C&C	1	\$0	\$0	\$0	\$0	\$5,000,000	\$5,000,000
Contingency %	40%	Subtotal:	\$44,512,000	\$46,842,000	\$5,690,000	\$816,000	\$25,000,000	\$122,860,000
Overhead %	Labor	Contingency:	\$17,804,800	\$18,736,800	\$2,276,000	\$326,400	\$10,000,000	\$49,144,000
	26%	Overhead:	\$11,573,120	\$4,215,780	\$1,479,400	\$73,440	\$2,250,000	\$19,591,740
Grand Total:	(rounded to two significant figures)		\$74,000,000	\$70,000,000	\$9,400,000	\$1,220,000	\$37,000,000	\$190,000,000

Table 11.7 POI – Little Goose – Lower Monumental #2 500 kV Cost Allocation

Queue #	Requested MW	MW Split	Plan of Service	MW Enabled	Station Equipment Allocation (Per Capita)	Station Equipment Cost	Non-Station Equipment Allocation (Per MW)	Non-Station Equipment Cost	Non-Network Direct Assigned	Direct Assigned Cost	Cost Assignment
G0923	100	100	New 500kV Substation w/ New Comms	235	100.00%	\$154M	N/A	N/A	Collector Station C&C and RAS	\$9M	\$163M
G0924	100	100			0.00%		N/A		Collector Station C&C and RAS	\$9M	\$9M
G0925	100	35			0.00%		N/A		Collector Station C&C and RAS	\$9M	\$20M
		65	SPB1: Lower Monumental - Stanfield 500kV Reinforcement	290	0.00%	N/A	1.940%	\$580M	N/A	N/A	
G0935	225	225			0.00%		6.716%		Collector Station C&C and RAS	\$9M	\$48M

11.6 POI – Longhorn 500 kV

Table 11.8 POI – Longhorn 500 kV Station Cost Estimate

Estimate Summary									Longhorn 500 kV POI 7	
Estimate #	Description		Quantity	Contract		BPA		Misc.	Total	
				Labor	Material	Labor	Material			
	LOCATION #1		-	-	-	-	-	-	-	
ST-070-65-10	500kV Add: 1x bay 2pos BAAH		1	\$11,708,000	\$9,614,000	\$1,810,000	\$0	\$58,000	\$23,190,000	
Collector C&C	Collector Station C&C		1	\$0	\$0	\$0	\$0	\$5,000,000	\$5,000,000	
POI C&C S	BPA POI Station C&C		1	\$0	\$0	\$0	\$0	\$5,000,000	\$5,000,000	
Contingency %	40%		Subtotal:	\$11,708,000	\$9,614,000	\$1,810,000	\$0	\$10,058,000	\$33,190,000	
Overhead %	Labor	Materials	Contingency:	\$4,683,200	\$3,845,600	\$724,000	\$0	\$4,023,200	\$13,276,000	
	26%	9%	Overhead:	\$3,044,080	\$865,260	\$470,600	\$0	\$905,220	\$5,285,160	
Grand Total:	(rounded to two significant figures)			\$19,000,000	\$14,000,000	\$3,000,000	\$0	\$15,000,000	\$52,000,000	

Table 11.9 POI – Longhorn 500 kV Cost Allocation

Queue #	Requested MW	Station Equipment	Station Equipment Allocation (Per Capita)	Station Equipment Cost	Non-Station Equipment	Non-Station Equipment Allocation (Per MW)	Non-Station Equipment Cost	Non-Network Direct Assigned	Direct Assigned Cost	Cost Assignment
G0752	340	Longhorn 500kV Substation Expansion w/ Comm Expansion	100%	\$43M	SPB1: Lower Monumental - Stanfield 500kV Reinforcement	10.149%	\$580M	Collector Station C&C and RAS	\$9M	\$111M



11.7 POI – Sixmile Canyon 500 kV

Table 11.10 POI –Sixmile Canyon 500 kV Station Cost Estimate

Estimate Summary									Sixmile Canyon 500 kV POI 8			
Estimate #	Description		Quantity	Contract		BPA		Misc.	Total			
				Labor	Material	Labor	Material					
	LOCATION #1		-	-	-	-	-	-	-			
ST-070-65-10	500kV Add: 1x bay 2pos BAAH		1	\$11,708,000	\$9,614,000	\$1,810,000	\$0	\$58,000	\$23,190,000			
Collector C&C	Collector Station C&C		2	\$0	\$0	\$0	\$0	\$10,000,000	\$10,000,000			
POI C&C S	BPA POI Station C&C		1	\$0	\$0	\$0	\$0	\$5,000,000	\$5,000,000			
Contingency %	40%		Subtotal:	\$11,708,000	\$9,614,000	\$1,810,000	\$0	\$15,058,000	\$38,190,000			
Overhead %	Labor	Materials	Contingency:	\$4,683,200	\$3,845,600	\$724,000	\$0	\$6,023,200	\$15,276,000			
	26%	9%	Overhead:	\$3,044,080	\$865,260	\$470,600	\$0	\$1,355,220	\$5,735,160			
Grand Total:	(rounded to two significant figures)			\$19,000,000	\$14,000,000	\$3,000,000	\$0	\$22,000,000	\$59,000,000			

Table 11.11 POI – Sixmile Canyon 500 kV Cost Allocation

Queue #	Requested MW	Station Equipment	Station Equipment Allocation (Per Capita)	Station Equipment Cost	Non-Station Equipment	Non-Station Equipment Allocation (Per MW)	Non-Station Equipment Cost	Non-Network Direct Assigned	Direct Assigned Cost	Cost Assignment
G0777	650	Sixmile Canyon 500kV Substation Expansion w/ Comm Expansion	100%	\$41M	N/A	N/A	N/A	Collector Station C&C and RAS	\$9M	\$50M
G0963	650		0%			N/A		Collector Station C&C and RAS	\$9M	\$9M



11.8 POI – Sixmile Canyon 230 kV

Table 11.12 POI –Sixmile Canyon 230 kV Station Cost Estimate

<i>Estimate Summary</i>								
<i>Sixmile Canyon 230 kV POI 9</i>								
Estimate #	Description		Quantity	Contract		BPA		Misc.
				Labor	Material	Labor	Material	
	LOCATION #1		-	-	-	-	-	-
ST-070-124-6	230kV Add: 1x bay 2pos BAAH		1	\$8,230,000	\$5,028,000	\$1,152,000	\$0	\$18,000
Collector C&C	Collector Station C&C		2	\$0	\$0	\$0	\$0	\$10,000,000
POI C&C S	BPA POI Station C&C		1	\$0	\$0	\$0	\$0	\$5,000,000
Contingency %	40%		Subtotal:	\$8,230,000	\$5,028,000	\$1,152,000	\$0	\$15,018,000
Overhead %	Labor	Materials	Contingency:	\$3,292,000	\$2,011,200	\$460,800	\$0	\$6,007,200
	26%	9%	Overhead:	\$2,139,800	\$452,520	\$299,520	\$0	\$1,351,620
Grand Total:	<i>(rounded to two significant figures)</i>			\$14,000,000	\$7,500,000	\$1,900,000	\$0	\$22,000,000
								\$45,000,000

Table 11.13 POI – Sixmile Canyon 230 kV Cost Allocation

Queue #	Requested MW	Station Equipment	Station Equipment Allocation (Per Capita)	Station Equipment Cost	Non-Station Equipment	Non-Station Equipment Allocation (Per MW)	Non-Station Equipment Cost	Non-Network Direct Assigned	Direct Assigned Cost	Cost Assignment
G0708	60	Sixmile Canyon 230kV	100%	\$27M	N/A	N/A	N/A	Collector Station C&C and RAS	\$9M	\$36M
G0944	261	Substation Expansion w/ Comm Expansion	0%			N/A		Collector Station C&C and RAS	\$9M	\$9M



11.9 POI – Webber Canyon 500 kV

Table 11.14 POI – Webber Canyon 500 kV Station Cost Estimate

Estimate Summary									Webber Canyon 500 kV POI 10								
Estimate #	Description		Quantity	Contract		BPA		Misc.	Total								
				Labor	Material	Labor	Material										
	LOCATION #1		-	-	-	-	-	-	-								
ST-070-65-10	500kV Add: 1x bay 2pos BAAH		0.5	\$5,854,000	\$4,807,000	\$905,000	\$0	\$29,000	\$11,595,000								
Collector C&C	Collector Station C&C		1	\$0	\$0	\$0	\$0	\$5,000,000	\$5,000,000								
POI C&C S	BPA POI Station C&C		1	\$0	\$0	\$0	\$0	\$5,000,000	\$5,000,000								
Contingency %	40%		Subtotal:	\$5,854,000	\$4,807,000	\$905,000	\$0	\$10,029,000	\$21,595,000								
Overhead %	Labor	Materials & Turnkey	Contingency:	\$2,341,600	\$1,922,800	\$362,000	\$0	\$4,011,600	\$8,638,000								
	26%		9%	Overhead:	\$2,130,856	\$605,682	\$329,420	\$0	\$1,263,654	\$4,329,612							
Grand Total:	(rounded to two significant figures)			\$10,300,000	\$7,300,000	\$1,600,000	\$0	\$15,000,000	\$35,000,000								

Table 11.15 POI – Webber Canyon 500 kV Cost Allocation

Queue #	Requested MW	Station Equipment	Station Equipment Allocation (Per Capita)	Station Equipment Cost	Non-Station Equipment	Non-Station Equipment Allocation (Per MW)	Non-Station Equipment Cost	Non-Network Direct Assigned	Direct Assigned Cost	Cost Assignment
G0920	0	Webber Canyon 230kV Substation Comm Expansion	100%	\$26M	N/A	N/A	N/A	Collector Station C&C and RAS	\$9M	\$35M



11.10 POI– UEC Blueridge 230 kV

Table 11.16 POI – Blueridge 230 kV Station Cost Estimate

Estimate Summary			Blueridge 230 kV POI 12						
Estimate #	Description		Quantity	Contract		BPA		Misc.	Total
				Labor	Material	Labor	Material		
	LOCATION #1		-	-	-	-	-	-	-
Collector C&C	Collector Station C&C		1	\$0	\$0	\$0	\$0	\$5,000,000	\$5,000,000
POI C&CS	BPA POI Station C&C		1	\$0	\$0	\$0	\$0	\$5,000,000	\$5,000,000
Contingency %	40%		Subtotal:	\$0	\$0	\$0	\$0	\$10,000,000	\$10,000,000
Overhead %	Labor	Materials	Contingency:	\$0	\$0	\$0	\$0	\$4,000,000	\$4,000,000
	26%	9%	Overhead:	\$0	\$0	\$0	\$0	\$900,000	\$900,000
Grand Total:	(rounded to two significant figures)			\$0	\$0	\$0	\$0	\$15,000,000	\$15,000,000

Table 11.17 POI – Blueridge 230 kV Cost Allocation

Queue #	Requested MW	Station Equipment	Station Equipment Allocation (Per Capita)	Station Equipment Cost	Non-Station Equipment	Non-Station Equipment Allocation	Non-Station Equipment Cost	Non-Network Direct Assigned	Direct Assigned Cost	Cost Assignment
G0908	0	Blueridge 230kV Substation Comm Expansion	100%	\$6M	N/A	N/A	N/A	Collector Station C&C and RAS	\$9M	\$15M

11.11 SPB1: Lower Monumental – Stanfield 500 kV Reinforcement

Table 11.18 SPB1 – Lower Monumental – Stanfield 500 kV Reinforcement Cost Estimate

Estimate Summary Lower Monumental - Stanfield 500 kV Reinforcement								
Estimate #	Description		Quantity	Contract		BPA		Misc.
				Labor	Material	Labor	Material	
	LOCATION #1		-	-	-	-	-	-
ST-070-65-10	500kV Add: 1x bay 2pos BAAH		2	\$23,416,000	\$19,228,000	\$3,620,000	\$0	\$116,000
LT-040-54-8	500kV: 1 mi, 3-Deschutes, SC all new towers		75	\$136,350,000	\$111,900,000	\$72,750,000	\$0	\$0
Contingency %	40%		Subtotal:	\$159,766,000	\$131,128,000	\$76,370,000	\$0	\$116,000
Overhead %	Labor	Materials	Contingency:	\$63,906,400	\$52,451,200	\$30,548,000	\$0	\$46,400
	26%	9%	Overhead:	\$14,378,940	\$34,093,280	\$19,856,200	\$0	\$10,440
Grand Total:	(rounded to two significant figures)			\$240,000,000	\$220,000,000	\$127,000,000	\$0	\$170,000
								\$580,000,000

Table 11.19 SPB1 – Lower Monumental – Stanfield 500 kV Reinforcement Cost Allocation

Queue #	Enabled MW	Percent Allocation	Cost Allocation
G0752	340	10.149%	\$ 58,865,671.64
G0822	1540	45.970%	\$ 266,626,865.67
G0919	220	6.567%	\$ 38,089,552.24
G0925	65	1.940%	\$ 11,253,731.34
G0935	225	6.716%	\$ 38,955,223.88
G0998	960	28.657%	\$ 166,208,955.22
Total:	3350	100%	\$ 580,000,000.00

