

TRANSMISSION PLANNING

GENERATION INTERCONNECTION REPORT

2025 TRANSITION CLUSTER STUDY (TCS)

CLUSTER AREA: TRI-CITIES/UMATILLA #1, PHASE 1, Revision 0

(25TCS CA-TU1 P1-0)

G0708	G0919	G1012
G0752	G0920	G1013
G0777	G0923	G1015
G0778	G0924	G1039
G0822	G0925	
G0834	G0935	
G0854	G0944	
G0855	G0963	
G0872	G0965	
G0908	G0998	

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**PREPARED BY:
BPA Transmission Planning**



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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.

Cluster Area Tri-Cities/Umatilla 1 (TU1) is comprised of Generation Interconnection Requests (IRs) in the Benton, Franklin, Garfield, and Walla Walla Counties of Washington State and the Morrow and Umatilla Counties of Oregon State. It includes 24 total IRs seeking a combined total of 10,133 MW of Interconnection Service and 6,390 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	60	-60	Morrow, OR
G0752	Solar/BESS/Gas	Longhorn 500 kV	340	-330	Morrow, OR
G0777	Solar	Sixmile Canyon 500 kV	650	-650	Morrow, OR
G0778	BESS	New Calpine-McNary 500 kV midline POI (Stanfield)	650	-650	Morrow, OR
G0822	Solar/BESS	Ashe 500 kV	2000	-2000	Benton, WA
G0834	Wind	New Lower Monumental-McNary 500 kV midline POI (Hat Rock)	450	-100	Umatilla, OR
G0854	Wind/Solar	UEC Ordnance 230 kV	600	0	Umatilla, OR
G0855	Solar/Wind/BESS	New Lower Monumental-McNary 500 kV midline POI (Hat Rock)	450	-100	Umatilla, OR
G0872	Wind	Central Ferry 230 kV	300	0	Garfield, WA
G0908	Solar/BESS	UEC Blueridge 230 kV	0	-200	Umatilla, OR
G0919	Steam/Nuclear	Ashe 500 kV	270	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

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



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
G0965	BESS	New Calpine-McNary 500 kV midline POI (Stanfield)	650	-650	Morrow, OR
G0998	Steam/Nuclear	Ashe 500 kV	1120	0	Benton, WA
G1012	Wind	New Lower Monumental-McNary 500 kV (Hat Rock)	67	0	Umatilla, OR
G1013	Wind	New Lower Monumental-McNary 500 kV (Hat Rock)	250	0	Umatilla, OR
G1015	Solar	New Lower Monumental-Hanford 500 kV	500	0	Franklin, WA
G1039	Solar/BESS	Ashe 500 kV	400	-400	Benton, 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	\$184M	Stanfield 500/230 kV Substation
G0919	ASHE 500 kV	SPB: Lower Monumental – Stanfield 500 kV line	\$24M	Stanfield 500/230 kV Substation
G0998	ASHE 500 kV	1x Ashe 500 kV Terminal SPB: Lower Monumental – Stanfield 500 kV line	\$129M	Stanfield 500/230 kV Substation
G1039	ASHE 500 kV	1x Ashe 500 kV Terminal SPB: Lower Monumental – Stanfield 500 kV line	\$65M	Stanfield 500/230 kV Substation
G0872	Central Ferry 230 kV	1x Central Ferry 500 kV Terminal Central Ferry 500/230 kV Bank #2 Central Ferry 230 kV Ring Bus SPB: Lower Monumental – Stanfield 500 kV line	\$199M	Stanfield 500/230 kV Substation
G0908	UEC Blueridge 230 kV	BPA Longhorn Local RAS	\$15M	N/A
G0752	Longhorn 500 kV	1x Longhorn 500 kV Terminal SPB: Lower Monumental – Stanfield 500 kV line	\$82M	N/A
G0778 G0965	New CALP-MCNY 500 kV (Stanfield)	Stanfield 500/230 kV Bank #2 2x Stanfield 230 kV Terminals SPB: Lower Monumental – Stanfield 500 kV line SPB: Stanfield – Sixmile Canyon 500 kV line	\$480M	Stanfield 500/230 kV Substation Sixmile Canyon 500/230 kV Substation
G0923 G0924 G0925 G0935	New LIGO-LOMO #2 500 kV	New 500 kV POI Ring Bus SPB: Lower Monumental – Stanfield 500 kV line	\$216M	Stanfield 500/230 kV Substation
G1015	New LOMO-HANF 500 kV	New 500 kV POI Ring Bus SPB: Lower Monumental – Stanfield 500 kV line	\$191M	Stanfield 500/230 kV Substation
G0834 G0855	New LOMO-MCNY 500 kV (Hat Rock)	New 500 kV Ring Bus New 230 kV POI Ring Bus	\$306M	Stanfield 500/230 kV Substation Sacajawea 115 kV Reinforcement



		500-230 kV Bank #1 SPB: Lower Monumental – Stanfield 500 kV line SPB: Stanfield – Sixmile Canyon 500 kV line		Sixmile Canyon 500/230 kV Substation
G1012 G1013	New LOMO-MCNY 500 kV (Hat Rock)	New 500 kV Ring Bus New 230 kV POI Ring Bus 500-230 kV Bank #1 SPB: Stanfield – Sixmile Canyon 500 kV line SPB: Lower Monumental – Stanfield 500 kV line	\$215M	Stanfield 500/230 kV Substation Sacajawea 115 kV Reinforcement
G0854	UEC Ordnance 230 kV	BPA Main Grid RAS	\$15M	N/A
G0708 G0944	Sixmile Canyon 230 kV	1x Sixmile Canyon 230 kV Terminal	\$45M	Sixmile Canyon 500/230 kV Substation
G0777 G0963	Sixmile Canyon 500 kV	1x Sixmile Canyon 500 kV Terminal	\$59M	Sixmile Canyon 500/230 kV Substation
G0920	Webber Canyon 500 kV	Participation in Webber Canyon RAS	\$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 Blueridge 230 kV (UEC)	204	0	Wind
G0363	UEC Blueridge 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 Blueridge 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



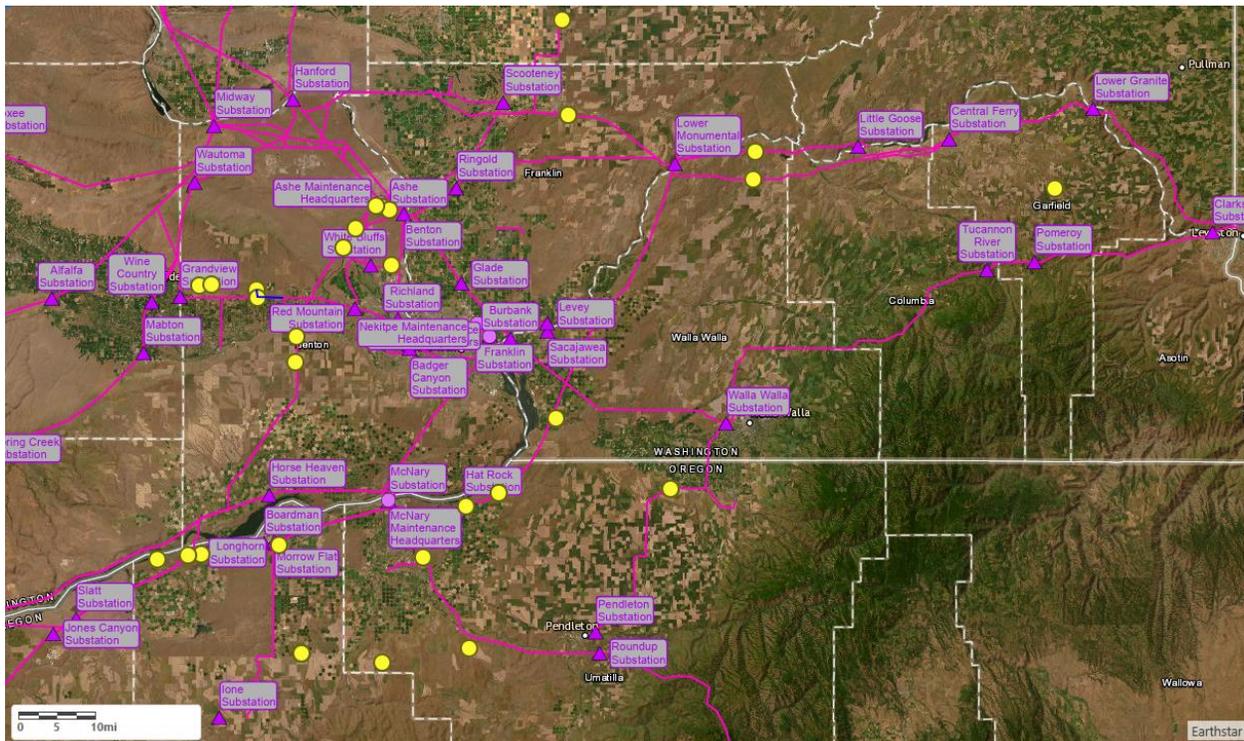
routed) to each generation facility where the Main Grid RAS Generation Dropping (GD) will occur.

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	270	0	Ashe 500 kV
G0998	Steam/Nuclear	1120	0	Ashe 500 kV
G1039	Solar/BESS	400	-400	Ashe 500 kV
G0872	Wind	300	0	Central Ferry 230 kV
G0908	Solar/BESS	0	-200	UEC Blairidge 230 kV
G0752	Solar/BESS/Gas	340	-330	Longhorn 500 kV
G0778	BESS	650	-650	New CALP-MCNY 500 kV (Stanfield)
G0965	BESS	650	-650	New CALP-MCNY 500 kV (Stanfield)
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	500	0	New Lower Monumental-Hanford 500 kV
G0834	Solar/Wind/BESS	450	-100	New Lower Monumental-McNary 500 kV (Hat Rock)
G0855	Solar/Wind/BESS	450	-100	New Lower Monumental-McNary 500 kV (Hat Rock)
G1012	Wind	67	0	New Lower Monumental-McNary 500 kV (Hat Rock)
G1013	Wind	250	0	New Lower Monumental-McNary 500 kV (Hat Rock)
G0854	Wind/Solar	600	0	UEC Ordnance 230 kV
G0708	BESS	60	-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 powerflow buses, split equally among each bus:

Bus Number	Bus Name
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
Sacajawea Reinforcement*	Lower Monumental - McNary #1 500 kV	Internal BPA	\$50M	Spring 2030
Stanfield Substation	Stanfield 230 kV	L0585	\$300M	Fall 2030

* Creates new 3-terminal line Ice Harbor-Sacajawea-Franklin 115 kV #1 (new 0.5 mi tap to Sacajawea), including significant amount of Sacajawea 115 kV switchgear.

7 Technical Analysis & Study Results

7.1 POI 1 – Ashe 500 kV

TCS System Performance

Table 7.1: Results for POI 1 – Ashe 500 kV

POI MW Thresholds	IRs Affected	Limiter (Element and TPL-001 Contingency Category)	Mitigation
-2400 to -1361	G0822, G0919 G0998, G1039	Lower Monumental – Sacajawea #1 500 kV, TPL-001 P1	Lower Monumental – Stanfield 500 kV Reinforcement, BPA RAS Participation (South of Ashe, West of Slatt)
-1360 to 460	G0822	No limiter	N/A
461 to 3790	G0822, G0919 G0998, G1039	Lower Monumental – Sacajawea #1 500 kV, TPL-001 P7	Lower Monumental – Stanfield 500 kV Reinforcement, RAS Participation (South of Ashe, West of Slatt)

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.

7.2 POI 2 – Lower Monumental – Hanford #1 500 kV

TCS System Performance

Table 7.2: Results for POI 2 – 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	N/A
271 to 500	G1015	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

270 MW of generation can be interconnected on Lower Monumental – Hanford #1 500 kV without mitigation. Generating the full requested 500 MW on Lower Monumental - Hanford #1 500 kV requires mitigation with a new Lower Monumental – Stanfield 500 kV line.

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

7.3 POI 3 – Little Goose – Lower Monumental #2 500 kV

TCS System Performance

Table 7.3: Results for POI 3 – 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 4 – Central Ferry 230 kV

TCS System Performance

Table 7.4: Results for POI 4 – Central Ferry 230 kV

POI MW Threshold	IRs Affected	Limiter (Element and TPL-001 Contingency Category)	Mitigation
0 to 250	G0872	None	N/A
251 to 300	G0872	Lower Monumental – Sacajawea #1 500 kV, TPL-001 P7	Lower Monumental – Stanfield 500 kV Reinforcement, Participation in BPA RAS (WOLM, WOM, South of Ashe)

Proposed Mitigations

The existing Central Ferry 230 kV yard is full. This POI will also require a new 500/230 kV bank and new 230 kV yard to create an interconnection terminal. Generating 250 MW requires no further reinforcement. Generating more than 250 MW at Central Ferry 230 kV requires mitigation with a new Lower Monumental – Stanfield 500 kV line .

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



7.5 POI 5 – Lower Monumental – McNary #1 500 kV (Hatrock)

TCS System Performance

Table 7.5: Results for POI 5 – Lower Monumental – McNary #1 500 kV

POI MW Threshold	IRs Affected	Limiter (Element and TPL-001 Contingency Category)	Mitigation
-200 to 820	G0834, G0855, G1012, G1013	McNary – Franklin #2 230 kV, TPL-001 P1	Lower Monumental – Stanfield 500 kV Reinforcement, RAS Participation (West of McNary, West of Slatt, South of Ashe)
821 to 1217	G0855, G1012, G1013	McNary – Longhorn #1 500 kV, TPL-001 P1	Stanfield – Sixmile Canyon 500 kV Reinforcement, RAS Participation (West of McNary, West of Slatt, South of Ashe)

Proposed Mitigations

No new interconnection on Lower Monumental – McNary #1 circuit is possible without additional system reinforcements. 820 MW of generation and 200 MW of grid-charging can be interconnected with a new 75-mile Lower Monumental – Stanfield 500 kV line.

Generating more than 820 MW on Lower Monumental – McNary #1 500 kV will require a second reinforcement, a new 37-mile Stanfield – Sixmile Canyon 500 kV line.

All generators must participate in existing and new BPA RAS near McNary (West of McNary, West of Slatt, South of Ashe).

7.6 POI 6 – Stanfield 230 kV

TCS System Performance

Table 7.6: Results for POI 6 – Stanfield 230 kV

POI MW Threshold	IRs Affected	Limiter (Element and TPL-001 Contingency Category)	Mitigation
-1300 to -181	G0778, G0965	Lower Monumental – Sacajawea-McNary#1 500 kV, TPL-001 P7	Lower Monumental – Stanfield 500 kV Reinforcement, RAS Participation (West of McNary, West of Slatt)
-180 to 710	G0778, G0965	None	N/A
711 to 1300	G0778, G0965	McNary – Longhorn #1 500 kV, TPL-001 P1-2	Stanfield – Sixmile Canyon 500 kV Reinforcement, RAS Participation (West of McNary, West of Slatt)

Proposed Mitigations

710 MW of generation and 180 MW of charging can be interconnected without reinforcement. Generating more than 710 MW at Stanfield 230 kV requires mitigation with a new 37-mile Stanfield – Sixmile Canyon 500 kV line..

Grid-charging more than 180 MW at Stanfield 230 kV requires mitigation with a new 75-mile Lower Monumental – Stanfield 500 kV line. Charging from this POI exacerbates the north-to-south limiter of Lomo-McNary 500 (Sacajawea 500/115 transformer).



All generators must participate in existing and new BPA RAS near McNary (West of McNary, West of Slatt).

7.7 POI 7 – Longhorn 500 kV

TCS System Performance

Table 7.7: Results for POI 7 – 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.

7.8 POI 8 – Sixmile Canyon 500 kV

TCS System Performance

Table 7.8: Results for POI 8 – 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).

7.9 POI 9 – Sixmile Canyon 230 kV

TCS System Performance

Table 7.9: Results for POI 9 – Sixmile Canyon 230 kV

POI MW Threshold	IRs Affected	Limiter (Element and TPL-001 Contingency Category)	Mitigation
-60 to 321	G0708, G0944	None	RAS Participation (West of Slatt, South of Ashe)

Proposed Mitigations

321 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).

7.10 POI 10 – Webber Canyon 500 kV

TCS System Performance

Table 7.10: Results for POI 10 – 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.

7.11 POI 11 – UEC Ordnance 230 kV

TCS System Performance

Table 7.11: Results for POI 11 – Ordnance 230 kV

POI MW Threshold	IRs Affected	Limiter (Element and TPL-001 Contingency Category)	Mitigation
0 to 600	G0854	Local UEC System	RAS Participation (local gen trip)

Proposed Mitigations

There are senior queued IRs and LLIRs proposing new BPA RAS near the POI. Participation in this new BPA RAS is required to enable any interconnection amount at Ordnance 230 kV

7.12 POI 12 – UEC Blueridge 230 kV

TCS System Performance

Table 7.12: Results for POI 12 – 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	Ordnance 230, Blueridge 230	G854, G908



9 Interconnection Facility Requirements

9.1 POI 1 – Ashe 500 kV

Table 9.1: POI 1 – 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
G1039	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 (6) 500 kV power circuit breakers, (12) 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 2 – Lower Monumental – Hanford #1 500 kV

Table 9.2: POI 2 – 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 3 – Little Goose – Lower Monumental #2 500 kV

Table 9.3: POI 3 – 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 4 – Central Ferry 230 kV

Table 9.4: POI 4 – Central Ferry 230 kV Facility requirements

G#	BPA Station Work	BPA Non-Station Work
G0872	New 230 kV ring bus with 2x 230 kV Terminals, 1x 500 kV Terminal	Central Ferry #2 500/230 kV transformer Lower Monumental – Stanfield 500 kV Reinforcement

1. Install (1) 500/230 kV transformer, (1) 500 kV power circuit breaker, (3) 500 kV disconnect switches and associated control, relaying and communications equipment.
2. Develop a new 230 kV yard in breaker and a half configuration. Install (2) 230 kV bays with (3) 230 kV power circuit breakers, (8) 230 kV disconnect switches and associated control, relaying and communication equipment.
3. Construct a new 500 kV line, Lower Monumental – Stanfield #1 500 kV (75mi).
4. Installation of BPA-required C&C equipment at customer’s Collector sites (RAS, Meters, relays, Control House space)
5. 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.



9.5 POI 5 – Lower Monumental – McNary #1 500 kV (Hat Rock)

Table 9.5: POI 5 – Lower Monumental – McNary #1 500 kV Facility requirements

G#	BPA Station Work	BPA Non-Station Work
G0834, G0855	500 kV Substation with terminals for McNary – Lower Monumental #1 500 kV line, 1x 500 kV Terminal, New 230 kV station with 1x 230 kV shared gen-tie Terminal	Lower Monumental – Stanfield 500 kV Reinforcement, Stanfield – Sixmile Canyon 500 kV Reinforcement, Lower Monumental – McNary #1 500/230 kV transformer
G1012, G1013	500 kV Substation with terminals for McNary – Lower Monumental #1 500 kV line, 1x 500 kV Terminal, New 230 kV station with 1x 230 kV shared gen-tie Terminal	Lower Monumental – Stanfield 500 kV Reinforcement Stanfield – Sixmile Canyon 500 kV Reinforcement, Lower Monumental – McNary #1 500/230 kV transformer

1. Develop a new 500 kV, 3-bay, substation in breaker and a half configuration. Develop (3) 500 kV bays with (4) 500 kV power circuit breakers, (8) 500 kV disconnect switches and associated control, relaying and communication equipment.
2. Install (1) 1300 MVA 500/230 kV transformer and all associated protection & communications equipment.
3. Develop a new 230 kV yard in breaker and a half configuration. Install (2) 230 kV bays with (3) 230 kV power circuit breakers, (8) 230 kV disconnect switches and associated control, relaying and communication equipment.
4. Construct a new 500 kV line, Lower Monumental – Stanfield #1 500 kV (75mi).
5. Construct a new 500 kV line, Stanfield – Sixmile Canyon #1 500 kV (37mi).
6. Installation of BPA-required C&C equipment at customer’s Collector sites (RAS, Meters, relays, Control House space)
7. Significant 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.

9.6 POI 6 – Stanfield 230 kV

Table 9.6: POI 6 – Stanfield 230 kV Facility requirements

G#	BPA Station Work	BPA Non-Station Work
G0778, G0935	1x 500/230 kV transformer with associated terminals, 1x 230 kV shared gen-tie Terminal	Lower Monumental – Stanfield 500 kV Reinforcement Stanfield – Sixmile Canyon 500 kV Reinforcement Stanfield #2 500/230 kV transformer

1. Install (1) 500/230 kV transformer, (1) 500 kV disconnect switch, and (1) 230 kV disconnect switch and associated control, relaying and communications equipment.
2. Expand existing 230 kV yard in breaker and a half configuration. Install (2) 230 kV bays with (5) 230 kV power circuit breakers, (10) 230 kV disconnect switches and associated control, relaying and communication equipment.
3. Construct a new 500 kV line, Lower Monumental – Stanfield #1 500 kV (75mi).
4. Construct a new 500 kV line, Stanfield – Sixmile Canyon #1 500 kV (37mi).



5. Installation of BPA-required C&C equipment at customer’s Collector sites (RAS, Meters, relays, Control House space)
6. 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 7 – Longhorn 500 kV

Table 9.7: POI 7 – 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.

9.8 POI 8 – Sixmile Canyon 500 kV

Table 9.8: POI 8 – 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.



9.9 POI 9 – Sixmile Canyon 230 kV

Table 9.9: POI 9 – 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.

9.10 POI 10 – Webber Canyon 500 kV

Table 9.10: POI 10 – 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.

9.11 POI 11 – Ordinance 230 kV

Table 9.11: POI 11 – Ordinance 230 kV Facility requirements

G#	BPA Station Work	BPA Non-Station Work
G0854	C&C, for Collector & POI	N/A

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



9.12 POI 12 – UEC Blueridge 230 kV

Table 9.12: POI 12 – UEC Blueridge 230 kV Facility requirements

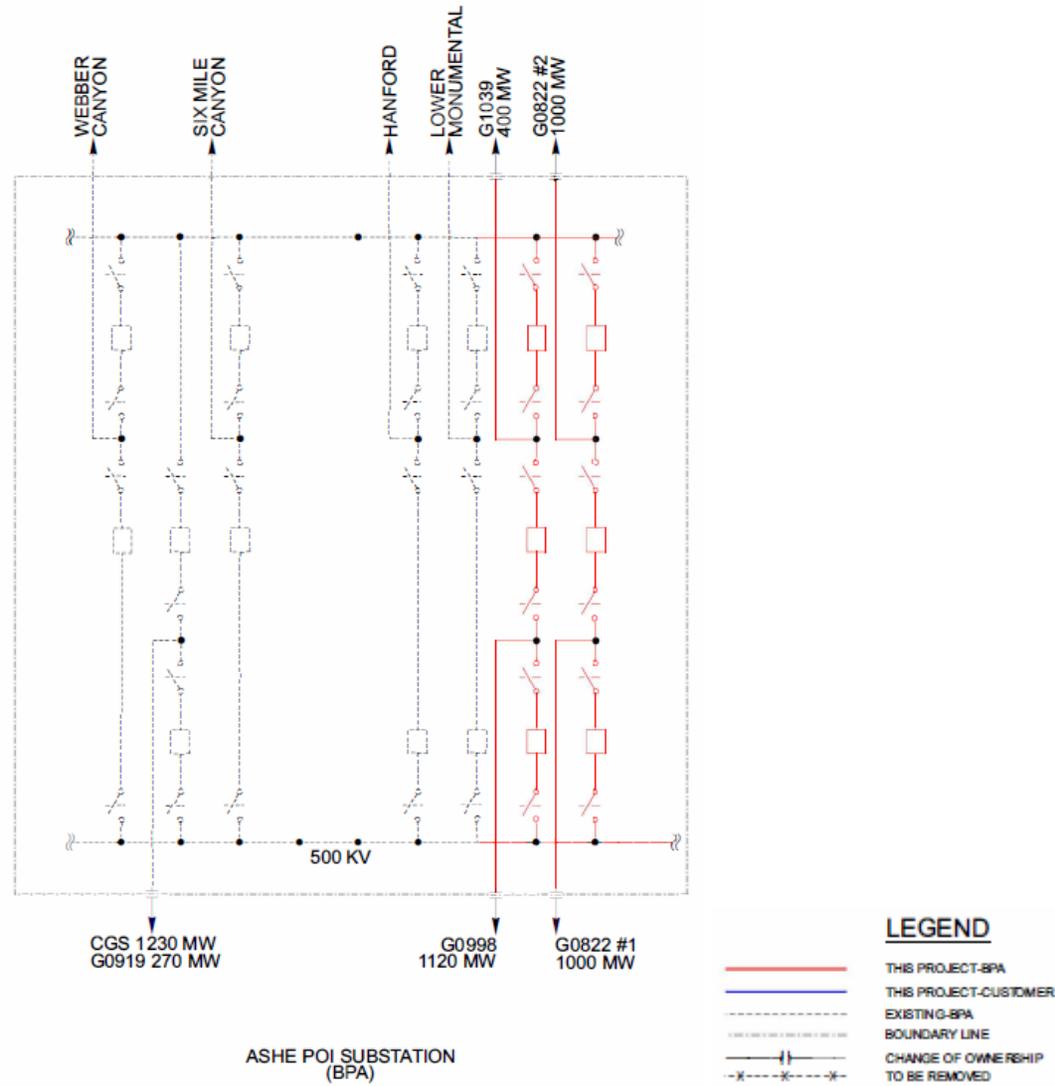
G#	BPA Station Work	BPA Non-Station Work
G0908	C&C, for Collector & POI	N/A

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)

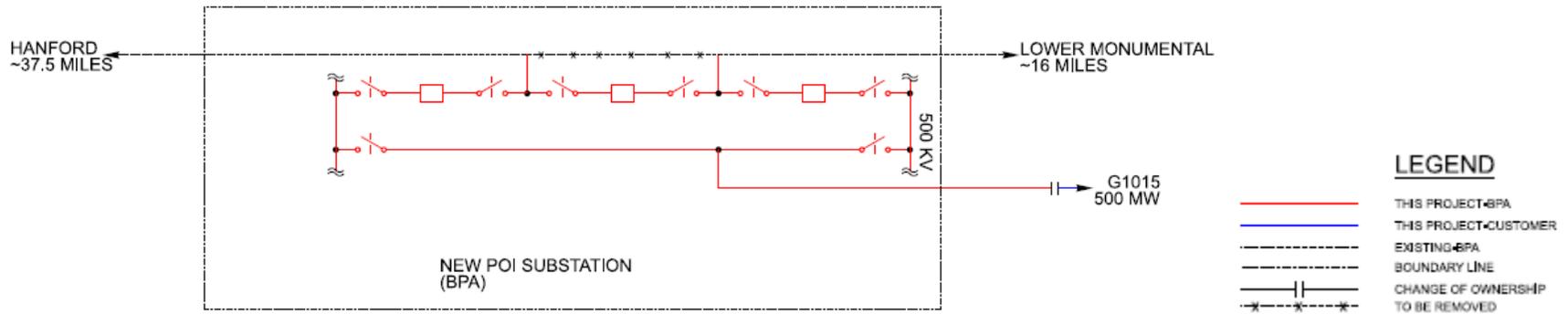


10 Project One-Line Drawings

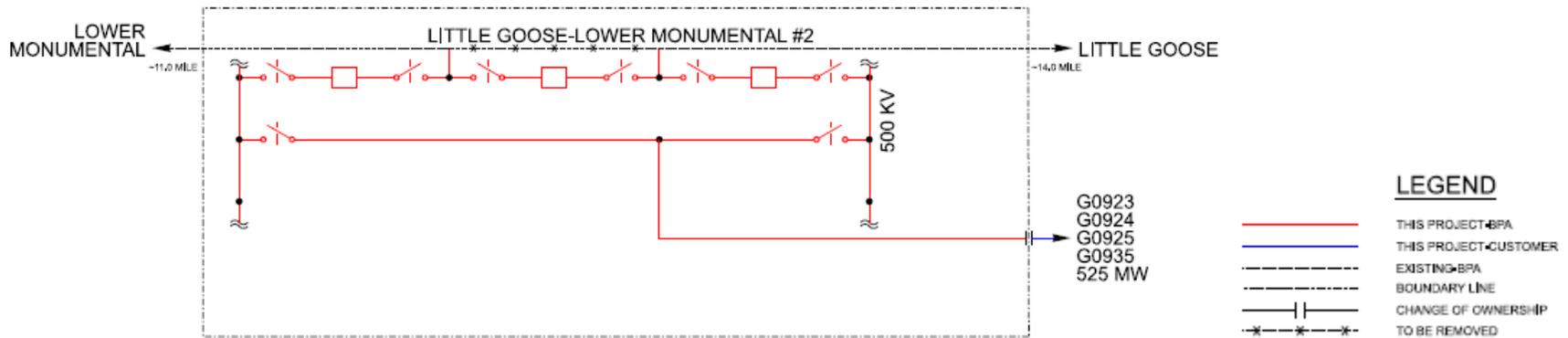
10.1 POI 1 – Ashe 500 kV



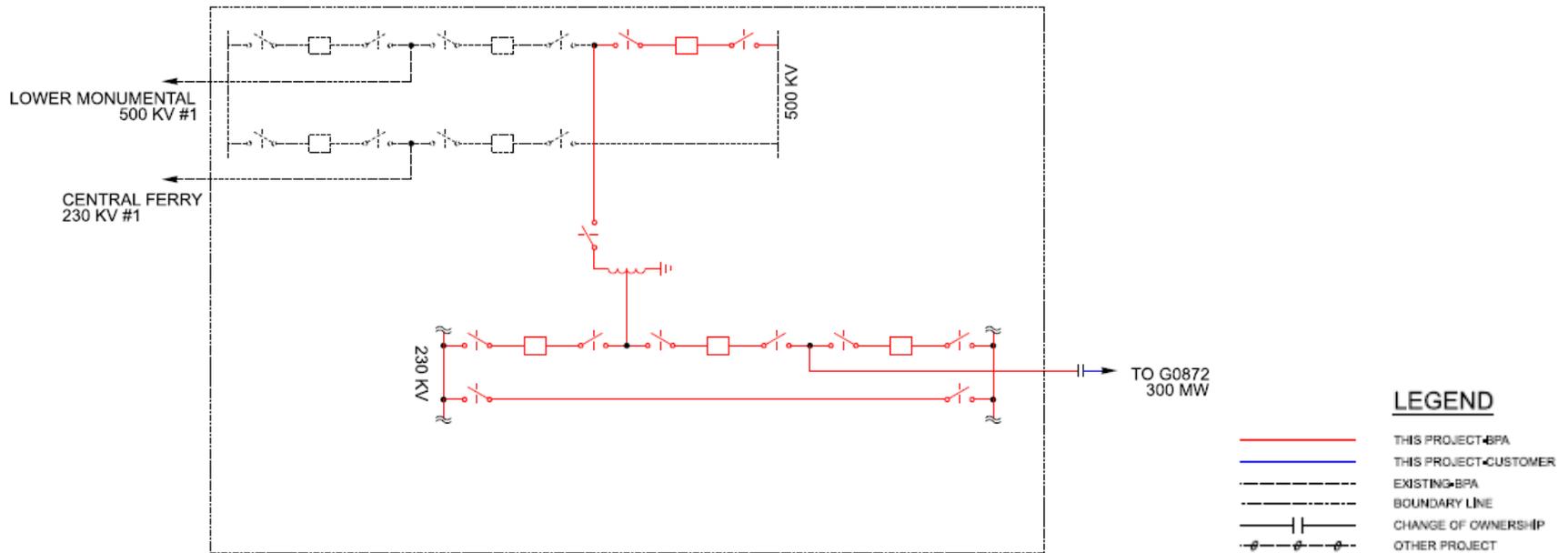
10.2 POI 2 – Lower Monumental – Hanford #1 500 kV



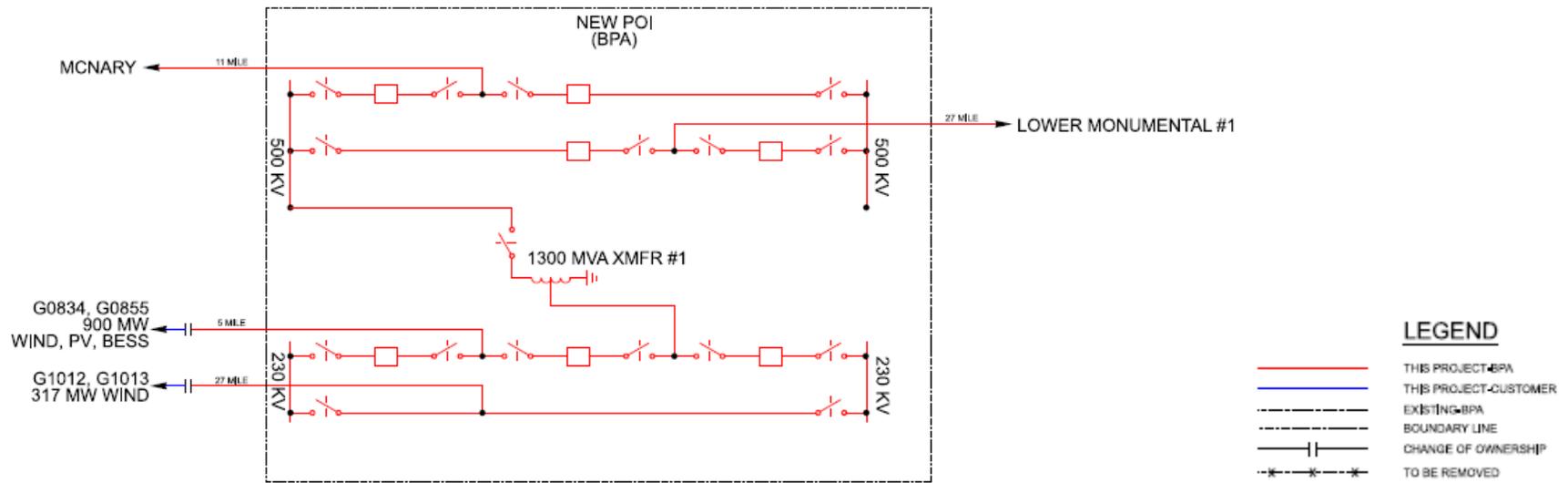
10.3 POI 3 – Little Goose – Lower Monumental #2 500 kV



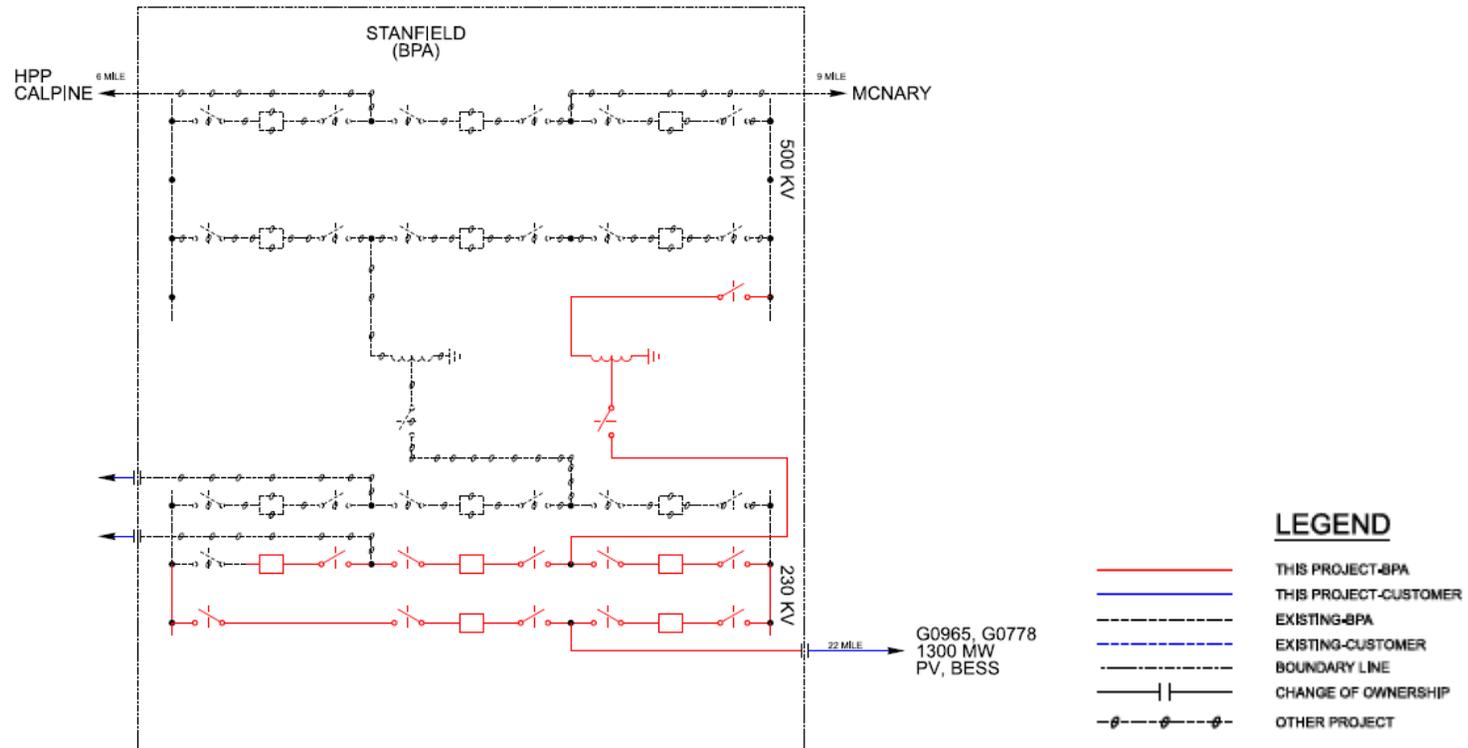
10.4 POI 4 – Central Ferry 230 kV



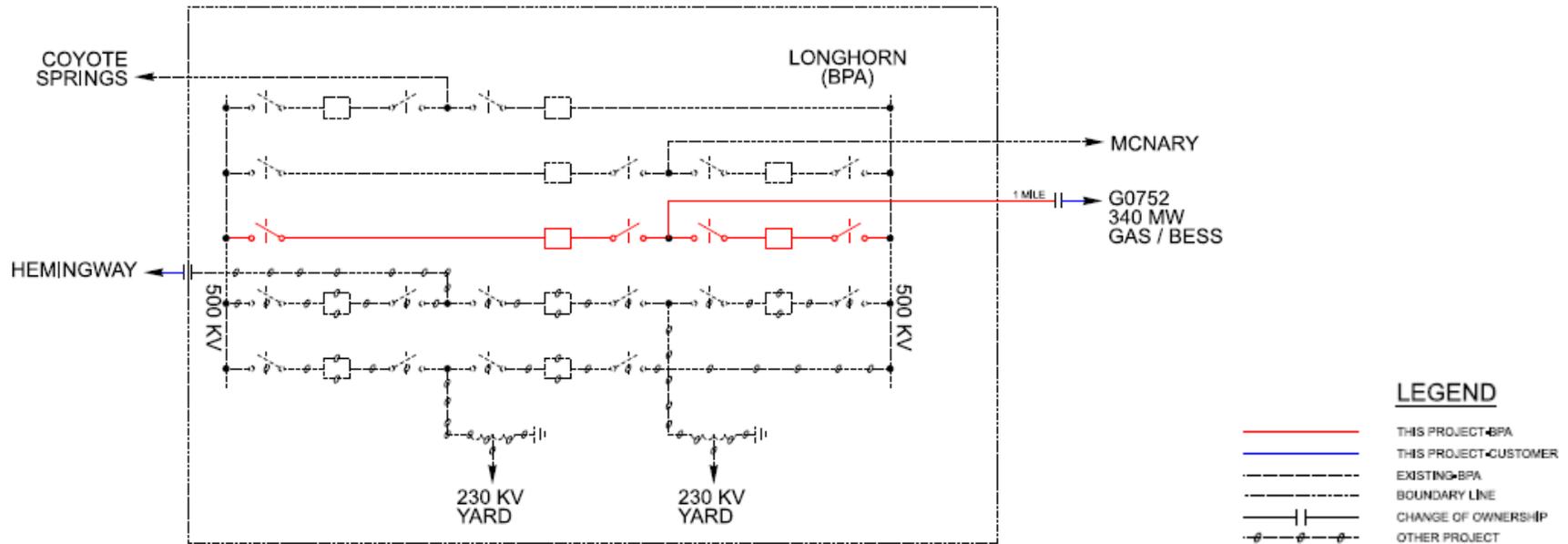
10.5 POI 5 – Lower Monumental – McNary #1 500 kV



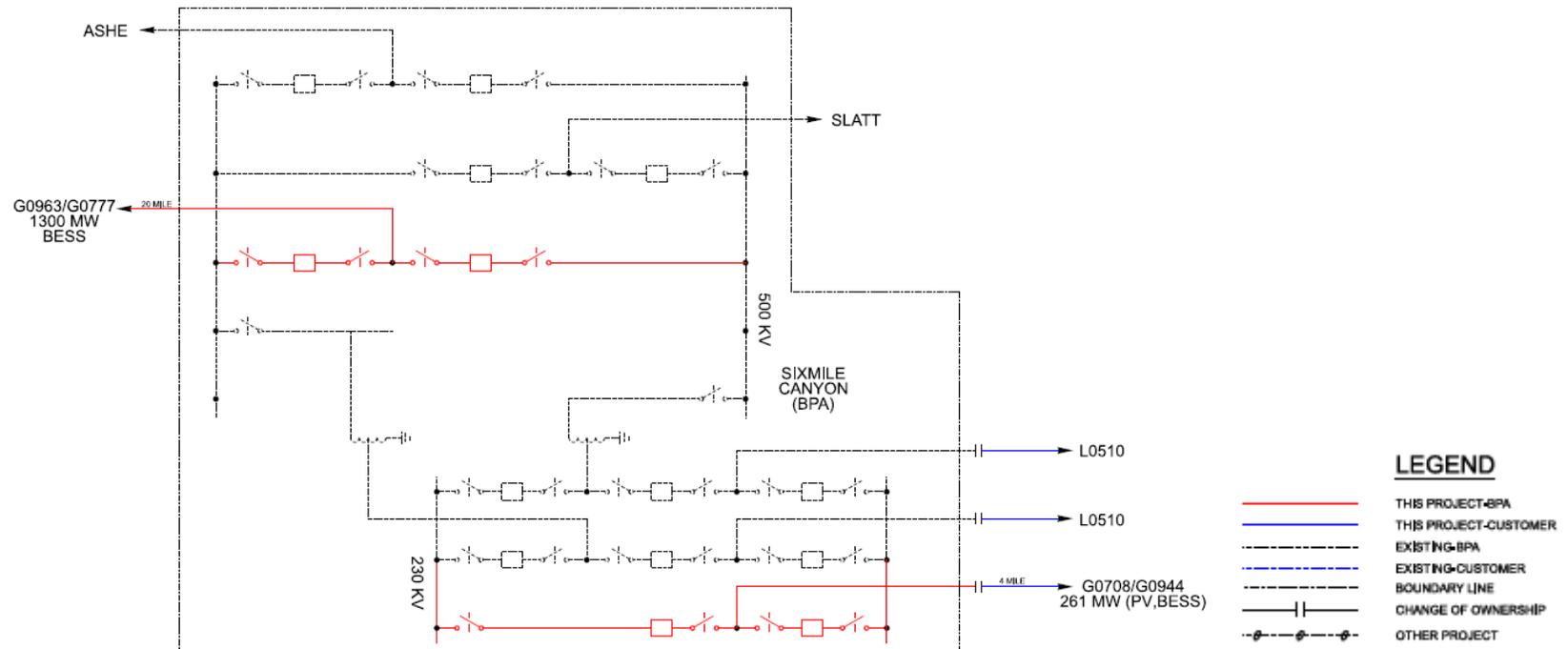
10.6 POI 6 – Stanfield 230 kV



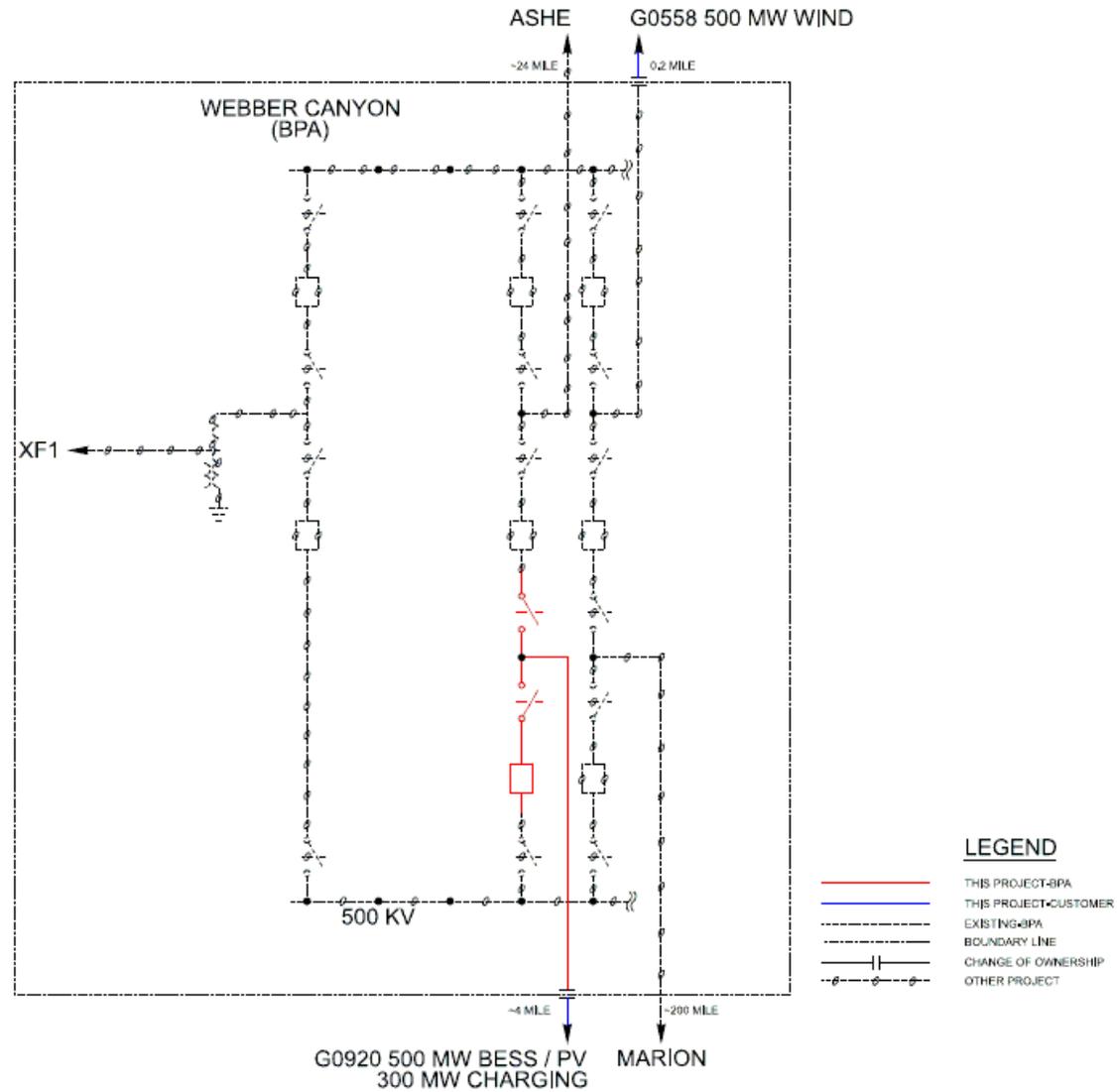
10.7 POI 7 – Longhorn 500 kV



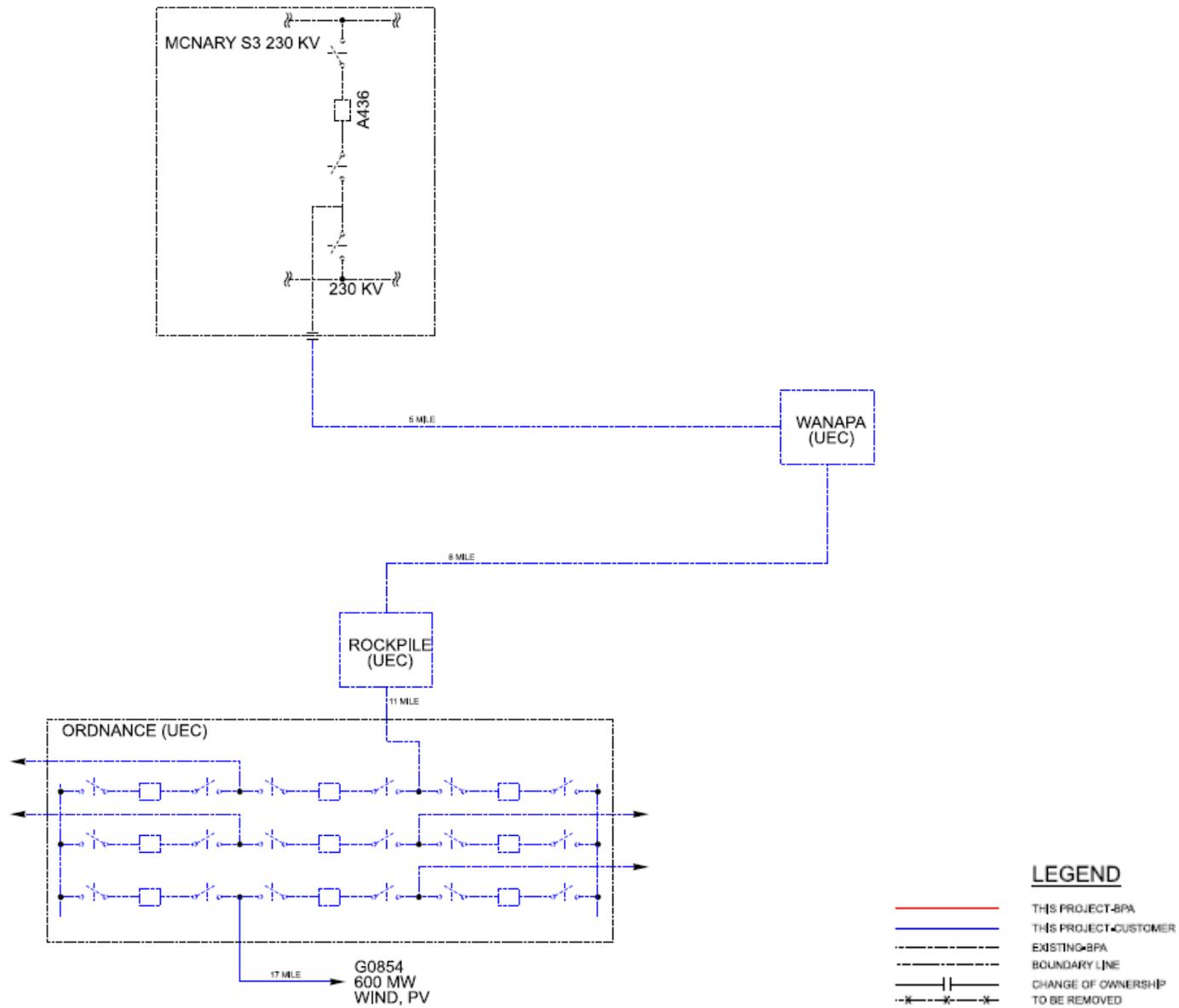
10.8 POI 8 and POI 9 – Sixmile Canyon 500/230 kV



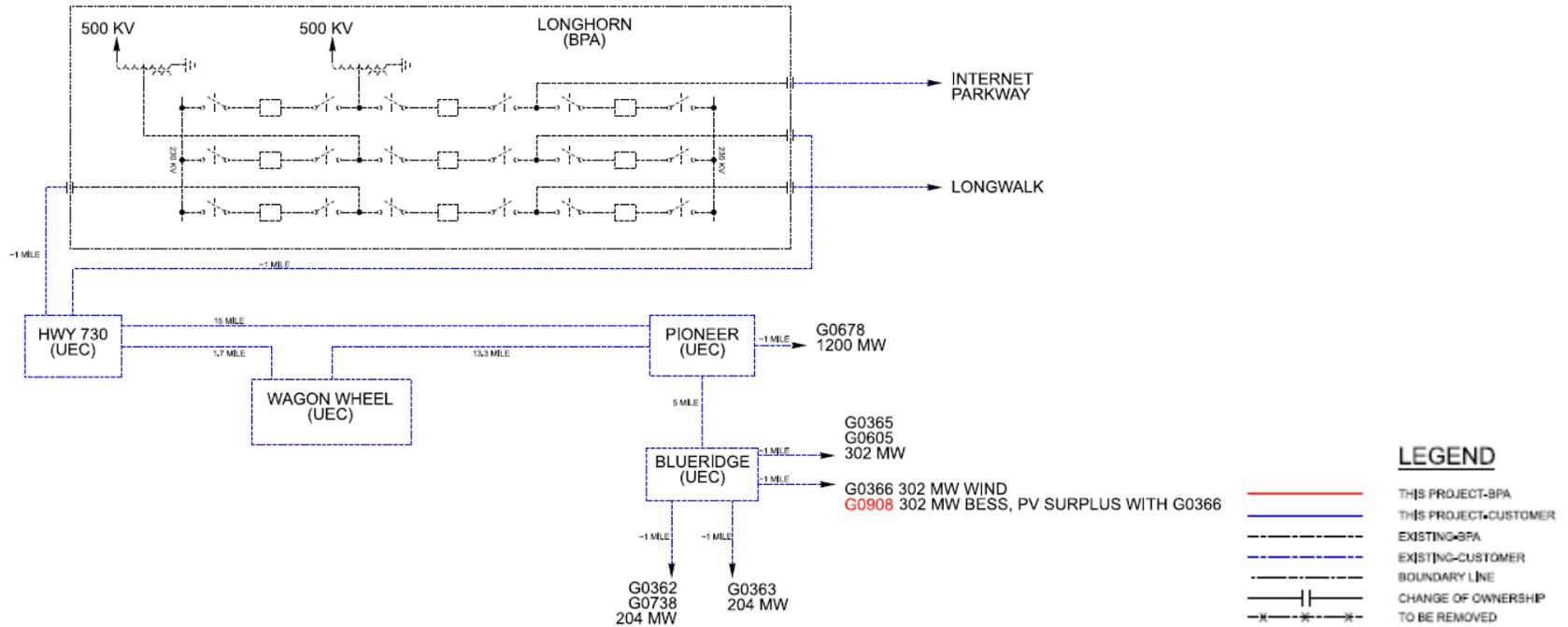
10.9 POI 10 – Webber Canyon 500 kV



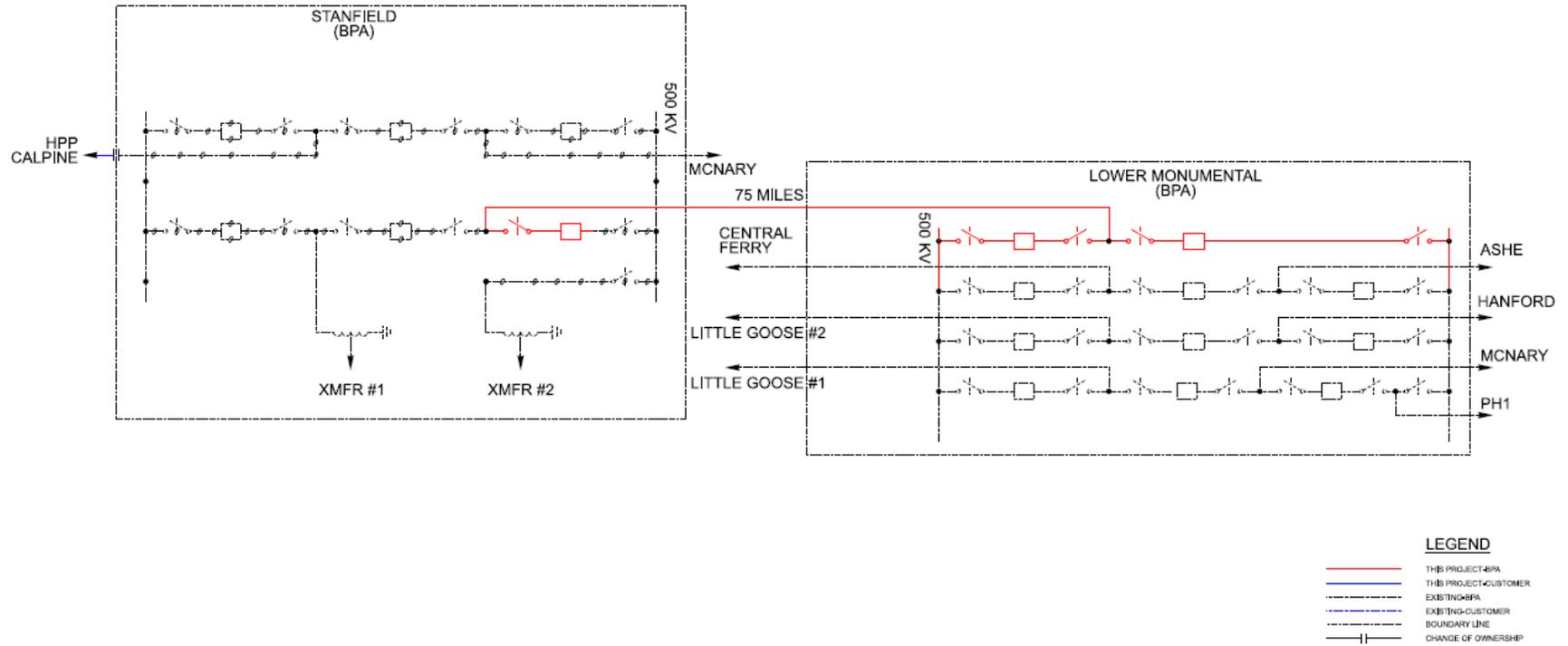
10.10 POI 11 – UEC Ordnance 230 kV



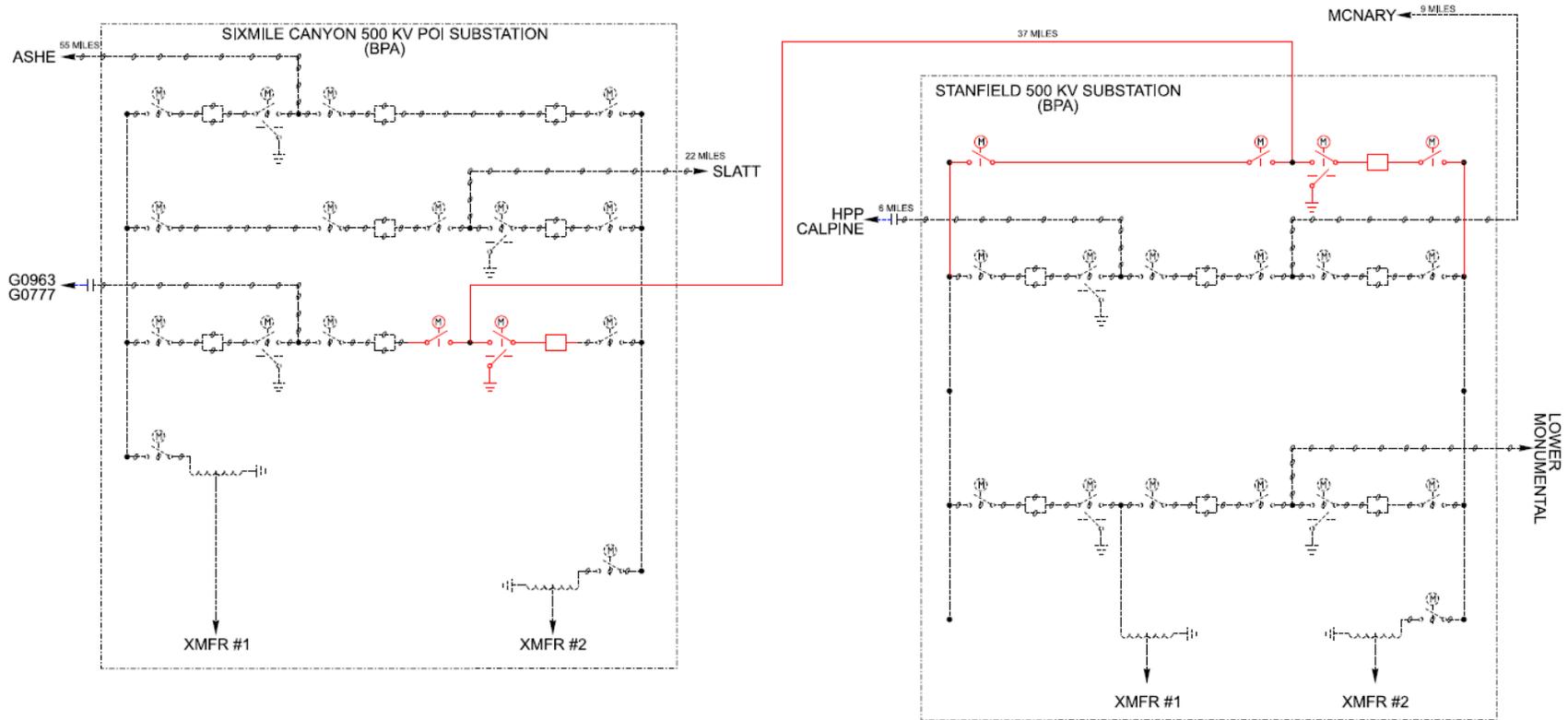
10.11 POI 12 – UEC Blueridge 230 kV



10.12 SPB: Lower Monumental – Stanfield 500 kV Reinforcement



10.13 SPB: Stanfield – Sixmile Canyon 500 kV Reinforcement



LEGEND

- THIS PROJECT-BPA
- THIS PROJECT-CUSTOMER
- - - - - EXISTING-BPA
- - - - - EXISTING-CUSTOMER
- |— BOUNDARY LINE
- ||— CHANGE OF OWNERSHIP
- OTHER PROJECT



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 1 – Ashe 500 kV

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

<i>Estimate Summary</i>									<i>Ashe 500 kV POI 1 (G0822 station costs)</i>								
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	\$23,200	\$9,276,000								
	26%	9%	Overhead:	\$4,261,712	\$1,211,364	\$658,840	\$0	\$682,308	\$6,814,224								
Grand Total:	<i>(rounded to two significant figures)</i>			\$21,000,000	\$15,000,000	\$3,200,000	\$0	\$8,300,000	\$47,000,000								

Table 11.2 POI 1 – Ashe 500 kV Station Cost Estimate 2 (G0998, G1039)

<i>Estimate Summary</i>									<i>Ashe 500 kV POI 1 (G0998, G1039 station costs)</i>								
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&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	\$12,558,000	\$35,690,000								
Overhead %	Labor	Materials & Turnkey	Contingency:	\$4,683,200	\$3,845,600	\$724,000	\$0	\$5,023,200	\$14,276,000								
	26%	9%	Overhead:	\$4,261,712	\$1,211,364	\$658,840	\$0	\$1,582,308	\$7,714,224								
Grand Total:	<i>(rounded to two significant figures)</i>			\$21,000,000	\$15,000,000	\$3,200,000	\$0	\$19,000,000	\$58,000,000								

Table 11.3 POI 1 – 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 w/Expanded Comms	460	100.00%	\$38M	N/A	N/A	Collector Station C&C and RAS	\$9M	\$184M
		1540	Ashe 500kV Substation Expansion 2 w/Expanded Comms		0.00%		23.692%		N/A	N/A	
G0919	270	270	SPB1: Lower Monumental - Stanfield 500kV Reinforcement	3330	0.00%	\$40M	4.154%	\$580M	N/A	N/A	\$24M
G0998	1120	1120			50.00%		17.231%		Collector Station C&C and RAS	\$9M	\$129M
G1039	400	400			50.00%		6.154%		Collector Station C&C and RAS	\$9M	\$65M



11.4 POI 2 –Lower Monumental – Hanford #1 500 kV

Table 11.4 POI 2 – Lower Monumental – Hanford #1 500 kV Station Cost Estimate

Estimate Summary		Lower Monumental - Hanford #1 500 kV POI 2						
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
	Materials		9%	\$11,573,120	\$4,215,780	\$1,479,400	\$73,440	\$900,000
Grand Total:	<i>rounded to two significant figures</i>	Overhead:	\$74,000,000	\$70,000,000	\$9,400,000	\$1,220,000	\$15,000,000	\$170,000,000

Table 11.5 POI 2 – 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 (Per MW)	Non-Station Equipment Cost	Non-Network Direct Assigned	Direct Assigned Cost	Cost Assignment
G1015	500	New 500kV Substation w/ New Comms	100%	\$161M	SPB1: Lower Monumental - Stanfield 500kV Reinforcement	3.538%	\$580M	Collector Station C&C and RAS	\$9M	\$191M



11.5 POI 3 – Little Goose – Lower Monumental #2 500 kV

Table 11.4 POI 3 – 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%	Materials	\$11,573,120	\$4,215,780	\$1,479,400	\$73,440	\$2,250,000	\$19,591,740
9%		Overhead:						
Grand Total:	<i>(rounded to two significant figures)</i>		\$74,000,000	\$70,000,000	\$9,400,000	\$1,220,000	\$37,000,000	\$190,000,000

Table 11.5 POI 3 – 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	\$15M
		65	0.00%	1.000%	N/A	N/A	N/A				
G0935	225	225	SPB1: Lower Monumental - Stanfield 500kV Reinforcement	290	0.00%	N/A	3.462%	\$580M	Collector Station C&C and RAS	\$9M	\$29M



11.6 POI 4 – Central Ferry 230 kV

Table 11.6 POI 4 –Central Ferry 230 kV Station Cost Estimate

<i>Estimate Summary</i>									<i>Central Ferry 230 kV POI 4 (station work)</i>								
Estimate #	Description		Quantity	Contract		BPA		Misc.	Total								
				Labor	Material	Labor	Material										
	LOCATION #1		-	-	-	-	-	-	-								
ST-070-39-12	230kV New POI: 3x PCB, 3pos, 2x bay BAAH		0.5	\$9,174,000	\$6,312,000	\$2,415,000	\$0	\$59,000	\$17,960,000								
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		1	\$0	\$0	\$0	\$0	\$5,000,000	\$5,000,000								
Contingency %	40%		Subtotal:	\$9,174,000	\$6,312,000	\$2,415,000	\$0	\$10,059,000	\$27,960,000								
Overhead %	Labor	Materials & Turnkey	Contingency:	\$3,669,600	\$2,524,800	\$966,000	\$0	\$4,023,600	\$11,184,000								
	26%	9%	Overhead:	\$3,339,336	\$795,312	\$879,060	\$0	\$1,267,434	\$6,281,142								
Grand Total:	<i>(rounded to two significant figures)</i>			\$16,000,000	\$9,600,000	\$4,300,000	\$0	\$15,000,000	\$45,000,000								

Table 11.7 POI 4 –Central Ferry 230 kV Non-Station Cost Estimate

<i>Estimate Summary</i>									<i>Central Ferry 230 kV POI 4 (non-station work)</i>								
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								
ST-070-141-6	500kV: 1x 525/241 433 MVA bank (1ph)		3	\$24,306,000	\$28,137,000	\$4,176,000	\$6,384,000	\$0	\$63,003,000								
ST-070-39-12	230kV New POI: 3x PCB, 3pos, 2x bay BAAH		0.5	\$9,174,000	\$6,312,000	\$2,415,000	\$0	\$59,000	\$17,960,000								
Contingency %	40%		Subtotal:	\$39,334,000	\$39,256,000	\$7,496,000	\$6,384,000	\$88,000	\$92,558,000								
Overhead %	Labor	Materials & Turnkey	Contingency:	\$15,733,600	\$15,702,400	\$2,998,400	\$2,553,600	\$35,200	\$37,023,200								
	26%	9%	Overhead:	\$14,317,576	\$4,946,256	\$2,728,544	\$804,384	\$11,088	\$22,807,848								
Grand Total:	<i>(rounded to two significant figures)</i>			\$69,000,000	\$60,000,000	\$13,000,000	\$9,700,000	\$134,000	\$150,000,000								

Table 11.8 POI 4 –Central Ferry 230 kV Cost Allocation

Queue #	Requested MW	Station Equipment	Station Equipment Allocation (Per Capita)	Station Equipment Cost	Non-Station Equipment (1)	Non-Station Allocation (Per MW)	Non-Station Equipment (1) Cost	Non-Station Equipment (2)	Non-Station Allocation (Per MW)	Non-Station Equipment (2) Cost	Non-Network Direct Assigned	Direct Assigned Cost	Cost Assignment
G0872	300	New 230kV Substation w/ New Comms	100%	\$36M	SPB1: Lower Monumental - Stanfield 500kV Reinforcement	0.769%	\$580M	New Central Ferry #2 500kV/230kV Transformer	100%	\$150M	Collector Station C&C and RAS	\$9M	\$199M



11.7 POI 5 – Lower Monumental – McNary #1 500 kV

Table 11.9 POI 5 – Lower Monumental – McNary #1 500 kV Line Station Cost Estimate

<i>Estimate Summary</i>		<i>Lower Monumental - McNary #1 500 kV POI 5 (station work)</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, w/180 MVAR Shunt Reactor	1	\$44,512,000	\$46,842,000	\$5,690,000	\$816,000	\$0	\$97,860,000
ST-070-39-12	230kV New POI: 3x PCB, 3pos, 2x bay BAAH	0.5	\$9,174,000	\$6,312,000	\$2,415,000	\$0	\$59,000	\$17,960,000
Collector C&C	Collector Station C&C	4	\$0	\$0	\$0	\$0	\$20,000,000	\$20,000,000
POIC&CL	BPA POI Station C&C	1	\$0	\$0	\$0	\$0	\$15,000,000	\$15,000,000
Contingency %	40%	Subtotal:	\$53,686,000	\$53,154,000	\$8,105,000	\$816,000	\$35,059,000	\$150,820,000
Overhead %	Labor	Contingency:	\$21,474,400	\$21,261,600	\$3,242,000	\$326,400	\$14,023,600	\$60,328,000
	Materials & Turnkey		Overhead:	\$19,541,704	\$6,697,404	\$2,950,220	\$102,816	\$4,417,434
	26%							
	9%							
Grand Total:	<i>(rounded to two significant figures)</i>		\$95,000,000	\$81,000,000	\$14,000,000	\$1,250,000	\$54,000,000	\$240,000,000

Table 11.10 POI 5 – Lower Monumental – McNary #1 500 kV Line Non-Station Cost Estimate

<i>Estimate Summary</i>		<i>Lower Monumental - McNary #1 500 kV POI 5 (non-station work)</i>						
Estimate #	Description	Quantity	Contract		BPA		Misc.	Total
			Labor	Material	Labor	Material		
	LOCATION #1	-	-	-	-	-	-	-
ST-070-141-6	500kV: 1x 525/241 433 MVA bank (1ph)	3	\$24,306,000	\$28,137,000	\$4,176,000	\$6,384,000	\$0	\$63,003,000
ST-070-39-12	230kV New POI: 3x PCB, 3pos, 2x bay BAAH	0.5	\$9,174,000	\$6,312,000	\$2,415,000	\$0	\$59,000	\$17,960,000
Contingency %	40%	Subtotal:	\$33,480,000	\$34,449,000	\$6,591,000	\$6,384,000	\$59,000	\$80,963,000
Overhead %	Labor	Contingency:	\$13,392,000	\$13,779,600	\$2,636,400	\$2,553,600	\$23,600	\$32,385,200
	Materials & Turnkey		Overhead:	\$12,186,720	\$4,340,574	\$2,399,124	\$804,384	\$7,434
	26%							
	9%							
Grand Total:	<i>(rounded to two significant figures)</i>		\$59,000,000	\$53,000,000	\$11,600,000	\$9,700,000	\$90,000	\$130,000,000

Table 11.11 POI 5 – Lower Monumental – McNary #1 500 kV Line Cost Allocation

Queue #	Requested MW	MW Split	Station Equipment	Station Equipment Allocation (Per Capita)	Station Equipment Cost	Non-Station Equipment	Non-Station Equipment Allocation (Per MW)	Non-Station Equipment Cost	Additional Non-Station Cost (Table 11.12)	Non-Network Direct Assigned	Direct Assigned Cost	Cost Assignment
G0834	450	450	New 500kV Substation	50.00%	\$204M	New 500/230kV Transformer	37.19%	\$130M	\$40M	Collector Station C&C and RAS	\$9M	\$199M
G0855	450	450		0.00%			37.19%		\$49M	Collector Station C&C and RAS	\$9M	\$106M
G1012	67	67	New 230kV Substation	50.00%			5.54%		\$13M	Collector Station C&C and RAS	\$9M	\$131M
G1013	250	243		0.00%			20.08%		\$49M	Collector Station C&C and RAS	\$9M	\$84M



Table 11.12 POI 5 – Lower Monumental – McNary #1 500 kV Line Cost Allocation

Queue #	Requested MW	MW Split	Plan of Service	MW Enabled	Non-Station Equipment Allocation	Non-Station Equipment Cost	Cost Assignment
G0834	450	450	SPB1: Lower	820	6.923%	\$580M	\$40M
G0855	450	370	Monumental - Stanfield 500kV Reinforcement		5.692%		\$49M
		80	SPB2: Stanfield -	4.714%	\$330M	\$13M	
G1012	67	67	Sixmile Canyon 500kV Reinforcement	404			3.948%
G1013	250	250					14.732%



11.8 POI 6 – Stanfield 230 kV

Table 11.13 POI 6 – Stanfield 230 kV Station Cost Estimate

Estimate Summary									Stanfield 230 kV POI 6 (station work)											
Estimate #	Description			Quantity	Contract		BPA		Misc.	Total	Description			Quantity	Contract		BPA		Misc.	Total
					Labor	Material	Labor	Material							Labor	Material				
	LOCATION #1			-	-	-	-	-	-	-				-	-	-	-	-	-	
ST-070-124-6	230kV Add: 1x bay 2pos BAAH			1.5	\$12,345,000	\$7,542,000	\$1,728,000	\$0	\$27,000	\$21,642,000										
Collector C&C	Collector Station C&C			2	\$0	\$0	\$0	\$0	\$10,000,000	\$10,000,000										
POI C&CS	BPA POI Station C&C			1	\$0	\$0	\$0	\$0	\$5,000,000	\$5,000,000										
Contingency %	40%			Subtotal:	\$12,345,000	\$7,542,000	\$1,728,000	\$0	\$15,027,000	\$36,642,000										
Overhead %	Labor		Materials & Turnkey	Contingency:	\$4,938,000	\$3,016,800	\$691,200	\$0	\$6,010,800	\$14,656,800										
	26%		9%		Overhead:	\$4,493,580	\$950,292	\$628,992	\$0	\$1,893,402	\$7,966,266									
Grand Total:	<i>(rounded to two significant figures)</i>				\$22,000,000	\$11,500,000	\$3,000,000	\$0	\$23,000,000	\$59,000,000										

Table 11.14 POI 6 – Stanfield 230 kV Non-Station Cost Estimate

Estimate Summary									Stanfield 230 kV POI 6 (non-station work)											
Estimate #	Description			Quantity	Contract		BPA		Misc.	Total	Description			Quantity	Contract		BPA		Misc.	Total
					Labor	Material	Labor	Material							Labor	Material				
	LOCATION #1			-	-	-	-	-	-	-				-	-	-	-	-	-	
ST-070-141-6	500kV: 1x 525/241 433 MVA bank (1ph)			3	\$24,306,000	\$28,137,000	\$4,176,000	\$6,384,000	\$0	\$63,003,000										
ST-070-124-6	230kV Add: 1x bay 2pos BAAH			0.5	\$4,115,000	\$2,514,000	\$576,000	\$0	\$9,000	\$7,214,000										
Contingency %	40%			Subtotal:	\$28,421,000	\$30,651,000	\$4,752,000	\$6,384,000	\$9,000	\$70,217,000										
Overhead %	Labor		Materials & Turnkey	Contingency:	\$11,368,400	\$12,260,400	\$1,900,800	\$2,553,600	\$3,600	\$28,086,800										
	26%		9%		Overhead:	\$10,345,244	\$3,862,026	\$1,729,728	\$804,384	\$1,134	\$16,742,516									
Grand Total:	<i>(rounded to two significant figures)</i>				\$50,000,000	\$47,000,000	\$8,400,000	\$9,700,000	\$14,000	\$115,000,000										

Table 11.15 POI 6 – Stanfield 230 kV Cost Allocation

Queue #	Requested MW	Station Equipment	Station Equipment Allocation (Per Capita)	Station Equipment Cost	Non-Station Equipment (1)	Non-Station Allocation (Per MW)	Non-Station Equipment (1) Cost	Non-Station Equipment (2)	Non-Station Allocation (Per MW)	Non-Station Equipment (2) Cost	Non-Station Equipment (3)	Non-Station Allocation (Per MW)	Non-Station Equipment (3) Cost	Non-Network Direct Assigned	Direct Assigned Cost	Cost Assignment
G0778	650	Stanfield Substation Expansion w/ Comm Expansion	100%	\$41M	SPB1: Lower Monumental - Stanfield 500kV Reinforcement	0.000%	\$580M	SPB2: Stanfield - Sixmile Canyon 500kV Reinforcement	38.303%	\$330M	New Stanfield #2 500/230kV Transformer	50.00%	\$115M	Collector Station C&C and RAS	\$9M	\$234M
G0965	650		0%		9.077%	38.303%		50.00%	Collector Station C&C and RAS			\$9M		\$246M		



11.9 POI 7 – Longhorn 500 kV

Table 11.15 POI 7 – 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	-	-	-	-	-	-	-	
SI-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	Contingency:	\$4,683,200	\$3,845,600	\$724,000	\$0	\$4,023,200	\$13,276,000	
	Materials		26%	9%	Overhead:	\$3,044,080	\$865,260	\$470,600	\$0
Grand Total:	<i>rounded to two significant figures</i>		\$19,000,000	\$14,000,000	\$3,000,000	\$0	\$15,000,000	\$52,000,000	

Table 11.16 POI 7 – 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	5.231%	\$580M	Collector Station C&C and RAS	\$9M	\$82M



11.10 POI 8 – Sixmile Canyon 500 kV

Table 11.17 POI 8 –Sixmile Canyon 500 kV Station Cost Estimate

<i>Estimate Summary</i>		<i>Sixmile Canyon 500 kV POI 8</i>							
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	Contingency:	\$4,683,200	\$3,845,600	\$724,000	\$0	\$6,023,200	\$15,276,000	
	Materials		26%	9%	Overhead:	\$3,044,080	\$865,260	\$470,600	\$0
Grand Total:	<i>(rounded to two significant figures)</i>		\$19,000,000	\$14,000,000	\$3,000,000	\$0	\$22,000,000	\$59,000,000	

Table 11.18 POI 8 – 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



11.11 POI 9 – Sixmile Canyon 230 kV

Table 11.19 POI 9 –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.	Total	
			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	\$14,428,000	
Collector C&C	Collector Station C&C	2	\$0	\$0	\$0	\$0	\$10,000,000	\$10,000,000	
POI C&S	BPA POI Station C&C	1	\$0	\$0	\$0	\$0	\$5,000,000	\$5,000,000	
Contingency %	40%	Subtotal:	\$8,230,000	\$5,028,000	\$1,152,000	\$0	\$15,018,000	\$29,428,000	
Overhead %	Labor	Contingency:	\$3,292,000	\$2,011,200	\$460,800	\$0	\$6,007,200	\$11,771,200	
	Materials		26%	9%	Overhead:	\$2,139,800	\$452,520	\$299,520	\$0
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 11.20 POI 9 – 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 Substation Expansion w/ Comm Expansion	100%	\$27M	N/A	N/A	N/A	Collector Station C&C and RAS	\$9M	\$36M
G0944	261		0%			N/A		Collector Station C&C and RAS		\$9M



11.12 POI 10 – Webber Canyon 500 kV

Table 11.21 POI 10 – Webber Canyon 500 kV Station Cost Estimate

<i>Estimate Summary</i>		<i>Webber Canyon 500 kV POI 10</i>						
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
POIC&CS	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	Contingency:	\$2,341,600	\$1,922,800	\$362,000	\$0	\$4,011,600	\$8,638,000
	Materials & Turnkey		Overhead:	\$2,130,856	\$605,682	\$329,420	\$0	\$1,263,654
	26%							
	9%							
Grand Total:	<i>(rounded to two significant figures)</i>		\$10,300,000	\$7,300,000	\$1,600,000	\$0	\$15,000,000	\$35,000,000

Table 11.22 POI 10 – 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



11.13 POI 11 – UEC Ordinance 230 kV

Table 11.23 POI 11 –Ordinance 230 kV Station Cost Estimate

<i>Estimate Summary</i>		<i>Ordinance 230 kV POI 11</i>						
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	Contingency:	\$0	\$0	\$0	\$0	\$4,000,000	\$4,000,000
	Materials		\$0	\$0	\$0	\$0	\$900,000	\$900,000
	26%	Overhead:	\$0	\$0	\$0	\$0	\$900,000	\$900,000
	9%		\$0	\$0	\$0	\$0	\$900,000	\$900,000
Grand Total: <i>(rounded to two significant figures)</i>			\$0	\$0	\$0	\$0	\$15,000,000	\$15,000,000

Table 11.24 POI 11 – Ordinance 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
G0854	600	Ordinance 230kV Substation Comm Expansion	100%	\$6M	N/A	N/A	N/A	Collector Station C&C and RAS	\$9M	\$15M



11.14 POI 12 – UEC Blueridge 230 kV

Table 11.25 POI 12 – Blueridge 230 kV Station Cost Estimate

<i>Estimate Summary</i>		<i>Blueridge 230 kV POI 12</i>						
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&C	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 26% Materials 9%	Contingency:	\$0	\$0	\$0	\$0	\$4,000,000	\$4,000,000
		Overhead:	\$0	\$0	\$0	\$0	\$900,000	\$900,000
Grand Total:	<i>(rounded to two significant figures)</i>		\$0	\$0	\$0	\$0	\$15,000,000	\$15,000,000

Table 11.26 POI 12 – 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



11.15 SPB1: Lower Monumental – Stanfield 500 kV Reinforcement

Table 11.27 SPB1 – Lower Monumental – Stanfield 500 kV Reinforcement Cost Estimate

<i>Estimate Summary</i>		<i>Lower Monumental - Stanfield 500 kV Reinforcement</i>						
Estimate #	Description	Quantity	Contract		BPA		Misc.	Total
			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	\$46,380,000
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	\$321,000,000
Contingency %	40%	Subtotal:	\$159,766,000	\$131,128,000	\$76,370,000	\$0	\$116,000	\$367,380,000
Overhead %	Labor	Contingency:	\$63,906,400	\$52,451,200	\$30,548,000	\$0	\$46,400	\$146,952,000
	Materials		Overhead:	\$14,378,940	\$34,093,280	\$19,856,200	\$0	\$10,440
Grand Total: <i>(rounded to two significant figures)</i>			\$240,000,000	\$220,000,000	\$127,000,000	\$0	\$170,000	\$580,000,000

Table 11.28 SPB1 – Lower Monumental – Stanfield 500 kV Reinforcement Cost Allocation

Queue #	Enabled MW	Percent Allocation	Cost Allocation
G0752	340	5.231%	\$ 30,338,461.54
G0777	650	10.000%	\$ 58,000,000.00
G0822	1540	23.692%	\$ 137,415,384.62
G0834	450	6.923%	\$ 40,153,846.15
G0855	370	5.692%	\$ 33,015,384.62
G0872	50	0.769%	\$ 4,461,538.46
G0919	270	4.154%	\$ 24,092,307.69
G0923	100	1.538%	\$ 8,923,076.92
G0924	100	1.538%	\$ 8,923,076.92
G0925	65	1.000%	\$ 5,800,000.00
G0935	225	3.462%	\$ 20,076,923.08
G0965	590	9.077%	\$ 52,646,153.85
G0998	1120	17.231%	\$ 99,938,461.54
G1015	230	3.538%	\$ 20,523,076.92
G1039	400	6.154%	\$ 35,692,307.69
Total:	6500	100%	\$ 580,000,000.00



11.16 SPB2: Stanfield – Sixmile Canyon 500 kV Reinforcement

Table 11.29 SPB2 – Sixmile Canyon 500 kV Reinforcement Cost Estimate

Estimate Summary		Stanfield - Sixmile Canyon 500 kV Reinforcement						
Estimate #	Description	Quantity	Contract		BPA		Misc.	Total
			Labor	Material	Labor	Material		
	LOCATION #1	-	-	-	-	-	-	-
ST-070-65-10	500kV Add: 1x bay 2 pos BAAH	2	\$23,416,000	\$19,228,000	\$3,620,000	\$0	\$116,000	\$46,380,000
LT-040-54-8	500kV: 1 mi, 3-Deschutes, SC all new towers	37	\$67,266,000	\$55,204,000	\$35,890,000	\$0	\$0	\$158,360,000
Contingency %	40%	Subtotal:	\$90,682,000	\$74,432,000	\$39,510,000	\$0	\$116,000	\$204,740,000
Overhead %	Labor	Contingency:	\$36,272,800	\$29,772,800	\$15,804,000	\$0	\$46,400	\$81,896,000
	Materials		Overhead:	\$23,577,320	\$6,698,880	\$10,272,600	\$0	\$10,440
26%	9%							
Grand Total:	<i>(rounded to two significant figures)</i>		\$150,000,000	\$111,000,000	\$66,000,000	\$0	\$170,000	\$330,000,000

Table 11.30 SPB2 – Sixmile Canyon 500 kV Reinforcement Cost Allocation

Queue #	Enabled MW	Percent Allocation	Cost Allocation
G0778	650	38.303%	\$ 126,399,528.58
G0855	80	4.714%	\$ 15,556,865.06
G0965	650	38.303%	\$ 126,399,528.58
G1012	67	3.948%	\$ 13,028,874.48
G1013	250	14.732%	\$ 48,615,203.30
Total:	1697	100%	\$ 330,000,000.00

