ROCKY MOUNTAIN POWER
A DIVISION OF PACIFICORP

1407 W. North Temple, Suite 320
Salt Lake City, UT 84116

June 30, 2017

VIA ELECTRONIC FILING
AND OVERNIGHT DELIVERY

Utah Public Service Commission
Heber M. Wells Building, 4th Floor
160 East 300 South
Salt Lake City, UT 84114

Attention: Gary Widerburg
Commission Secretary

RE: Docket No. 17-035-40
Application for Approval of a Significant Energy Resource Decision and Voluntary Request for Approval of Resource Decision

In accordance with Utah Public Service Commission Rule 746-1-203, Rocky Mountain Power hereby submits for electronic filing its request, in accordance with Utah Code Ann. § 54-17-302, that the Commission issue an order approving the a "significant energy resource decision" to construct or procure four new Wyoming wind resources with a total capacity of 860 megawatts.

Also, in accordance with Utah Code Ann. § 54-17-402, the Company requests that the Commission issue an order approving its "resource decision" for facilities associated with the Company's Energy Gateway West transmission project.

Additionally, pursuant to Utah Code Ann. § § 54-4-23 and 54-17-403 the Company seeks approval of its proposed accounting treatment with the net deferral of costs and benefits associated with the projects to be passed through the proposed Resource Tracking Mechanism ("RTM").

As requested by the Commission, Rocky Mountain Power is also providing seven (7) printed copies of the filing via overnight delivery. Workpapers supporting this application will also be provided electronically.

Rocky Mountain Power is currently preparing pro hac vice motions on behalf of its counsel at McDowell Rackner Gibson PC.

Rocky Mountain Power respectfully requests that all formal correspondence and requests for additional information regarding this filing be addressed to the following:

By E-mail (preferred): datarequest@pacificorp.com
Bob.lively@pacificorp.com

By regular mail: Data Request Response Center
PacifiCorp
825 NE Multnomah, Suite 2000
Portland, OR 97232

Informal inquiries may be directed to Bob Lively at (801) 220-4052.

Sincerely,

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Attorneys for Rocky Mountain Power

BEFORE THE PUBLIC SERVICE COMMISSION OF UTAH

IN THE MATTER OF THE APPLICATION OF ROCKY MOUNTAIN POWER FOR APPROVAL OF A SIGNIFICANT ENERGY RESOURCE DECISION AND VOLUNTARY REQUEST FOR APPROVAL OF RESOURCE DECISION	Docket No. 17-035-40. **APPLICATION FOR APPROVAL OF A SIGNIFICANT ENERGY RESOURCE DECISION AND VOLUNTARY REQUEST FOR APPROVAL OF RESOURCE DECISION**

I. INTRODUCTION

In accordance with Utah Code Ann. §§ 54-17-302 and 54-17-402, PacifiCorp doing business as Rocky Mountain Power ("Rocky Mountain Power" or "Company") submits this Application to the Public Service Commission of Utah ("Commission"). In accordance with Utah Admin. Code R746-440-1(2)(a), on June 23, 2017, the Company filed a Notice of Intent to file this Application.

The Company respectfully requests (a) under Utah Code Ann. § 54-17-302, that the Commission issue an order approving the Company's "significant energy resource decision" to

construct or procure four new Wyoming wind resources with a total capacity of 860 megawatts ("MW") (collectively, the "Wind Projects") and (b) under Utah Code Ann. § 54-17-402, that the Commission issue an order approving its "resource decision" for the following transmission facilities, significant portions of which are associated with the Company's Energy Gateway West transmission project: (1) the 140-mile, Aeolus-to-Anticline 500 kV line, which includes construction of the new Aeolus and Anticline substations; (2) the five-mile Anticline to Jim Bridger 345 kV line, which includes modifications at the existing Jim Bridger substation to allow termination of the new 345 kV line; (3) installation of a voltage control device at the Latham substation; (4) a new 16-mile 230 kV transmission line parallel to an existing 230 kV line from Shirley Basin substation to the proposed Aeolus substation, including modifications to the existing Shirley Basin substation; (5) the reconstruction of four miles of an existing 230 kV transmission line between the proposed Aeolus substation and the Freezeout substation, including modifications as required at the Freezeout substation; and (6) the reconstruction of 14 miles of an existing 230 kV transmission line between the Freezeout substation and the Standpipe substation including modifications as required at the Freezeout and Standpipe substations (collectively "Transmission Projects"). Items 1-3 above are collectively referred to as the "Aeolus to Bridger/Anticline Line," and items 4-6 above are collectively referred to as the "230 kV Network Upgrades." The Transmission Projects and the Wind Projects are collectively referred to as the "Combined Projects."

The Combined Projects are a time-limited opportunity to obtain cost-effective generation and construct necessary transmission facilities with minimal impact on customer rates. The Transmission Projects are necessary to relieve existing congestion and will enable interconnection of the proposed Wind Projects into the Company's transmission system. The Wind Projects produce zero-fuel-cost energy and federal production tax credits ("PTC"), and provide significant economic benefits for the Company's customers when combined with the Transmission Projects.

The Company further requests, under Utah Code Ann. §§ 54-4-1, 54-4-23, 54-17-303, 54-17-402 and -403, approval of its proposed ratemaking treatment for the Combined Projects. The Company proposes to match the costs and benefits of the Combined Projects through a new deferral

and cost recovery Resource Tracking Mechanism ("RTM") until the costs and benefits are reflected in base rates. Variances in PTCs would continue to be tracked after all other costs and a base level of PTCs are reflected in base rates. This proposed ratemaking treatment will ensure that the costs and benefits of the Combined Projects are properly matched and customers and shareholders are treated fairly while delivering long-term benefits overall.

The Combined Projects are time-sensitive because they must be in commercial operation by the end of 2020 to fully achieve the PTC benefits. To complete construction of all facilities by December 31, 2020, the Company requests that the Commission approve the significant energy resource decision related to the Wind Projects and the resource decision related to the Transmission Projects by March 30, 2018.

II. THE APPLICANT

PacifiCorp provides retail electric service under the name Rocky Mountain Power in the states of Wyoming, Utah, and Idaho, and under the name Pacific Power in the states of Oregon, Washington, and California. Rocky Mountain Power is a public utility in the state of Utah subject to the jurisdiction of the Commission with regard to its electric service to retail customers in Utah. The Company serves approximately 840,000 customers and has approximately 2,000 employees in Utah.

Formal correspondence and requests for additional information regarding this matter should be addressed to:

By e-mail (preferred): datarequest@pacificorp.com

By regular mail:
Data Request Response Center
PacifiCorp
825 NE Multnomah, Suite 2000
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With copies to:
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Yvonne Hogle
Assistant General Counsel
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Informal inquiries related to this Application should be directed to Bob Lively, Utah Regulatory Affairs Manager, at (801) 220-4052.

III. SUPPORTING TESTIMONY

This Application is supported by the pre-filed written direct testimony and exhibits of the following Company witnesses:

- **Cindy A. Crane,** President and Chief Executive Officer of Rocky Mountain Power, provides an overview of the Company's Application, outlines the policy considerations supporting the Company's decision to invest in the Combined Projects, explains why these acquisitions are prudent and in the public interest, and describes the financial ability of the Company to invest in the Combined Projects.
- **Chad A. Teply**, Vice President of Strategy and Development, provides a detailed description of the Company's proposed acquisition of the Wind Projects. Mr. Teply describes the Wind Projects, addresses the impact and timing of PTCs on their acquisition, and provides information to respond to the requirements of Utah Admin. Code R746-430-2.
- **Rick A. Vail**, Vice President of Transmission, outlines the need for the Transmission Projects, and provides a detailed description of the transmission facilities. Mr. Vail also addresses the requirements in Utah Admin. Code R746-440-1 for the Transmission Projects.
- **Rick T. Link**, Vice President of Resource and Commercial Strategy, testifies regarding the economic analysis that supports the prudence of the Combined Projects, and describes the customer benefits resulting from the timely acquisition

and construction of the wind and transmission facilities. Mr. Link explains the planning and analysis of the Combined Projects in the Company's 2017 Integrated Resource Plan ("2017 IRP"). He also provides background on the pending 2017R request for proposals ("2017R RFP") for the wind resources.

- **Jeffrey K. Larsen**, Vice President of Regulation, explains the Company's proposal for ratemaking treatment of the costs and benefits of the Combined Projects, including introducing new tariff, Schedule 97B, Resource Tracking Mechanism ("RTM"), and the inter-jurisdictional allocation of costs.

IV. OVERVIEW OF THE COMBINED PROJECTS

The Company requests approval of its significant energy resource decision to construct or procure the 860 MW Wind Projects, along with the resource decision to construct the Transmission Projects. The Combined Projects are time-limited opportunities and inextricably linked—the Transmission Projects relieve congestion in eastern Wyoming, and the Wind Projects will rely on the new Transmission Projects for interconnection and allow the Company to realize the benefits of zero-fuel-cost energy and associated PTCs.

The economics of the Combined Projects rely on PTCs, the Company must complete all construction by the end of 2020 to fully qualify for the PTC benefit. To achieve operation by 2020, the Company needs approval of this Application by March 30, 2018, as set forth in the proposed procedural schedule included in the Application.

To support the critical path schedule of the Transmission Projects, this case must run concurrently with the Company's 2017R RFP for wind resources. The Company anticipates issuing its 2017R RFP to the market in August 2017, and expects to identify the winning bids in January 2018. The Wind Projects will be submitted into the 2017R RFP as Company benchmark resources. The Company requests approval of the resource decision for the Wind Projects so that if selected in the 2017R RFP, the Company can proceed expeditiously to capture the time-limited opportunity discussed above. To comply with the requirements in Utah Code Ann. § 54-17-302(1), once the Company identifies the winning bids from the 2017R RFP, it will provide that information as soon as

practicable to the Commission. If facilities other than, or in addition to, the Company's benchmarks provide incremental value and are ultimately selected, the Company will update its filing accordingly.

A. Proposed Facilities.

1. Wind Projects.

The Company's 2017R RFP will seek the acquisition of up to approximately 1,270 MW of new wind resources capable of interconnecting to, or delivering energy and capacity across, the Company's transmission system in Wyoming. For this Application, the Company requests approval of the four Wind Projects, which are comprised of three nominal 250 MW facilities (referred to as Ekola Flats, TB Flats I, and TB Flats II) and a fourth nominal 110 MW facility (McFadden Ridge II), all located in Wyoming. For each of these facilities, the Company either has control over the site, or has secured development and implementation rights.

The Wind Projects will be submitted into the 2017R RFP as Company benchmark resources. The Company recognizes, however, that these resources may not ultimately be selected. If these resources are not selected in the 2017R RFP, they will be replaced by an economically superior resource.

The Company's assessment of the Combined Projects benefits has also incorporated known qualifying facility ("QF") projects that hold preferential interconnection queue positions and executed contracts, and are reasonably expected to be in service by year-end 2021.

The substantial customer benefits resulting from the acquisition of the Wind Projects assumes those facilities qualify for 100 percent of the federal PTCs. Each of the Wind Projects can demonstrate eligibility for 100 percent of the PTC benefits if the Wind Projects (and the Transmission Projects discussed below) are commercially operational by December 31, 2020. To facilitate construction of the facilities, the Company respectfully requests approval of this significant energy resource decision no later than March 30, 2018, so that equipment and engineering, procurement, and construction ("EPC") contracts can be executed shortly thereafter.

The estimated cost for the Wind Projects is outlined in Mr. Teply's testimony.

2. Transmission Projects.

The Transmission Projects include the six major elements outlined in the first section of the Application, which comprise the Aeolus-to-Bridger/Anticline Line and the 230 kV Network Upgrades. The Transmission Projects will allow the Company to implement system improvements, relieve existing congestion, and interconnect incremental Wyoming wind resources, including the Wind Projects, to support customer needs and deliver benefits to customers in the most cost-effective way.

First, the Transmission Projects will increase transfer capability out of eastern Wyoming. Currently, the Company's transmission system in eastern Wyoming is operating at capacity, which limits transfer of existing resources from eastern Wyoming and precludes the ability to interconnect additional resources east of where the new Anticline substation will be located. The Transmission Projects will increase the transfer capability from east to west Wyoming by 750 MW. When the Transmission Projects are complete, they will allow up to 1,270 MW of incremental wind resources to be interconnected into the system east of the proposed location for the new Anticline substation—including the 860 MW Wind Projects.

Second, the Transmission Projects will provide critical voltage support to the transmission system in southeastern Wyoming. Under certain operating conditions, voltage control issues have limited the ability to add additional resources, particularly wind resources. The addition of the Transmission Projects will solve the voltage control issues.

Third, the Transmission Projects will increase reliability, relieve congestion, reduce capacity and energy losses on the transmission system, and provide greater flexibility managing existing generation resources. Currently, outages on the existing 230 kV system in eastern Wyoming result in deration of the transfer capacity out of eastern Wyoming and some outage scenarios require significant generation curtailment. The new Aeolus-to-Anticline line will significantly reduce, if not eliminate, many of the impacts caused by the 230 kV outages. Reduced capacity and energy losses on the transmission system have the potential to provide significant cost savings over time.

The estimated cost for the Transmission Projects is outlined in Mr. Vail's testimony.

As of the filing of this Application, the Company has obtained a federal right-of-way permit from the Bureau of Land Management ("BLM") for the portion of the Aeolus-to-Anticline line that crosses BLM lands, which covers approximately half of the 140 miles. Once the Commission approves the resource decision, and the Wyoming Public Service Commission issues certificates of public convenience and necessity, the Company will obtain the additional rights-of-way and state and local permits necessary to construct the Transmission Projects.

B. The Proposed Resources Provide Substantial Customer Benefits and Advance the Public Interest.

The Company's 2017 IRP, which was filed with the Commission on April 4, 2017, identified the Combined Projects as least-cost, least-risk resources.[1] The Company's 2017 IRP is designed to ensure, on a long-term basis, an adequate and reliable electricity supply at a reasonable cost and in a manner that is consistent with the long-term public interest. To that end, the IRP's primary objective is to identify the best mix of resources to serve customers over the short- and long-term, based on an analysis of the costs and risks associated with various resource portfolios. The IRP identifies the preferred portfolio as the least-cost, least-risk portfolio that can be delivered through specific action items at a reasonable cost and with manageable risks, while ensuring compliance with state and federal regulatory obligations. The preferred portfolio in the 2017 IRP included the acquisition of additional Wyoming wind resources, like the Wind Projects, and the Transmission Projects.

Assuming the new Combined Projects are operational by the end of 2020, and thus eligible for 100 percent PTCs, the Company's economic analysis in support of this Application demonstrates that the Projects will provide substantial customer benefits. The Company's economic analysis included multiple electricity and natural gas price and carbon-risk scenarios, measured over several different time periods. In virtually all cases, the Combined Projects result in significant customer benefits. For example, with medium natural gas and medium CO_2 price assumptions over the life of the facilities, the present-value reduction in the change to revenue requirement due to the Combined

[1] The IRP does not identify specific resources. Wind resources in eastern Wyoming, like the Wind Projects, however, were identified in the preferred portfolio as least-cost, least-risk resources.

Projects is $137 million. Because the Company did not quantify the added benefits associated with RECs, the economic analysis is conservative.

In the first full year of operation of the Combined Projects, 2021, the rate impact to customers is less than 1.9 percent. While this percentage change reflects the year-one impact to customers, it does not fully reflect the value of the Combined Projects due to costs avoided over time.

C. To Meet the 2020 PTC Deadline, the Company is Concurrently Conducting its 2017R RFP Process.

The Combined Projects are mutually dependent. The Wind Projects are not economic without the Transmission Projects, which are needed to relieve existing congestion and to interconnect new PTC-eligible wind resources in high-wind areas of Wyoming. The Transmission Projects are not economic if there are no incremental cost-effective wind resources generating zero-fuel-cost energy and the associated PTCs. This interdependence requires that the Combined Projects be developed together. The lead time for constructing the Transmission Projects is longer than the lead time to construct the Wind Projects, but the Company recognizes the need for review and approval of its competitive market procurement of the Wind Projects and their impact on overall Project economics before it commits to proceed with construction of the Transmission Projects. This dictates the need for approval by March 30, 2018.

The Company has already initiated the process for obtaining approval or acknowledgment of its 2017R RFP from the Commission.[2] Following the necessary regulatory approvals, the Company anticipates issuing the 2017R RFP to the market in August 2017. Responses to the 2017R RFP will be due by October 2017 and in November and December, the Company will complete the initial shortlist bid evaluation. The Company plans to complete its final shortlist bid evaluation in early January 2018, and execute contracts in April 2018.

To facilitate review of this Application before the conclusion of the 2017R RFP process and the selection of winning bids, the Company has included the Wind Projects, which will be submitted

[2] See Docket No. 17-035-23.

into the 2017R RFP as benchmark resources. Upon completion of the 2017R RFP shortlist determination, the Company will provide the Commission with updated information, as soon as practicable, related to the Wind Projects and the outcome of the solicitation process.

D. Proposed Ratemaking Treatment.

The Company further requests, under Utah Code Ann. §§ 54-4-1, 54-4-23, 54-17-303, 54-17-402 and -403, approval of the ratemaking treatment for the Combined Projects. The Company proposes to match the costs and benefits of the Combined Projects through the RTM until the costs and benefits are reflected in base rates. Once the full costs and benefits are included in base rates, recovery of those elements would cease through the RTM, with the exception of PTCs. After the impacts of the Combined Projects are fully reflected in base rates, the Company proposes to use the RTM to track the actual change in PTCs from the base level included in rates. Because PTCs are entirely dependent on the variable output of the Wind Projects and difficult to precisely forecast, tracking PTCs through the RTM ensures that customers and the Company are treated fairly, with the actual value of the PTCs provided to customers.

V. LEGAL STANDARD

A. Significant Energy Resource Decision Related to the Wind Projects.

Utah Code Annotated § 54-17-302(1) requires utilities to obtain approval of significant energy resource decisions after the completion of the solicitation process, if one is required, and before the utility constructs or enters into a binding agreement to acquire a significant energy resource. A significant energy resource is defined in Utah Code Ann. § 54-17-102(4) and includes a resource that is 100 MW or more of new generating capacity with a dependable life of 10 or more years. The Commission must determine whether the significant energy resource decision is: (1) consistent with the Commission's administrative rules; (2) reached in compliance with the solicitation process approved by the Commission; and (3) in the public interest. Utah Code Ann. § 54-17-302(3).

The public interest determination must consider the following:

- Whether the decision will most likely result in the acquisition, production, and delivery of utility services at the lowest reasonable cost to the retail customers of the utility;
- Long-term and short-term impacts;
- Risk;
- Reliability;
- Financial impacts on the utility; and
- Other factors determined by the commission to be relevant.

Utah Code Ann. § 15-17-302(3)(c).

In addition, the Commission has previously relied on a pending utility IRP when approving a significant energy resource decision. *See In the Matter of the Application of PacifiCorp, by and through its Rocky Mountain Power Division for Approval of a Solicitation Process for a Flexible Resource for the 2012-2017 Time Period, and for Approval of a Significant Energy Resource Decision*, Docket Nos. 07-035-94 & 10-035-126, Report and Order at 21, 23 (April 20, 2011).

The proposed Wind Projects are greater than 100 MW and therefore qualify as a significant energy resource and require Commission approval under Utah Code Ann. § 54-17-302(1).

The Uniform System of Accounts and Generally Accepted Accounting Principles allows deferrals of identifiable utility expenses or revenues to the period in which the underlying expense or revenue will be included in the determination of customers' rates. Pursuant to Utah Code Ann. §§ 54-4-23 and 54-17-303, the Company requests that the Commission allow it to defer the costs and benefits of the Wind Projects and recover the balance through the RTM through an annual rate adjustment, as described in Mr. Larsen's testimony.

B. Energy Resource Decision Related to the Transmission Projects.

Utah Code Ann. § 54-17-402 authorizes the Commission to approve a utility's proposed "resource decisions" outside of a general rate case. Resource decisions are defined to include those relating to "an energy utility's acquisition, management, or operation of energy production, processing, transmission, or distribution facilities or processes." Utah Code Ann. § 54-17-401(2)(a). When considering a request to approve a resource decision, the Commission must determine

"whether the decision is in the public interest." Utah Code Ann. § 54-17-402(3)(b). The public interest determination must consider the following:

- Whether the decision will most likely result in the acquisition, production, and delivery of utility services at the lowest reasonable cost to the retail customers of the utility;
- Long-term and short-term impacts;
- Risk;
- Reliability;
- Financial impacts on the utility; and
- Other factors determined by the Commission to be relevant.

Utah Code Ann. § 15-17-402(3)(b).

The Company's decision to construct the Transmission Projects is a resource decision under Utah Code Ann. § 54-17-401(2)(a)(i) because it involves the acquisition of transmission facilities.

The Uniform System of Accounts and Generally Accepted Accounting Principles allows deferrals of identifiable utility expenses or revenues to the period in which the underlying expense or revenue will be included in the determination of customers' rates. Pursuant to Utah Code Ann. §§ 54-4-23 and 54-17-403, the Company requests that the Commission allow it to defer the costs and benefits of the Transmission Projects and recover the balance through the RTM through an annual rate adjustment, as described in Mr. Larsen's testimony.

C. The Projects Satisfy the Public Interest Standard in Utah Code Ann. §§ 54-17-302 and 54-17-402.

The public interest determination under Utah Code Ann. §§ 54-17-302 and 54-17-402 requires the Commission to consider the same five factors. This Application and the accompanying testimony of Ms. Crane and Messrs. Teply, Vail, Link, and Larsen, demonstrate that the Combined Projects are the least-cost, least-risk resource option for the Company and will provide substantial customer benefits. Indeed, as discussed above, the Projects will save customers money over the long-term. The Combined Projects are also consistent with the analysis and modeling in the Company's 2017 IRP, where both types of resources are included in the near-term action plan as part of the

preferred portfolio. Mr. Vail's testimony describes the reliability benefits that will result from the construction of the Transmission Projects.

The testimony of Ms. Crane further demonstrates that the Company has the financial ability to construct or acquire the Projects and that this significant energy resource decision will not adversely impact the Company's ability to provide safe and reliable electric service at just and reasonable rates.

Finally, the Company's testimony and this Application demonstrate compliance with the Commission's administrative rules, as set forth in Attachment A. The Company's supplemental filing following the conclusion of the 2017R RFP process will demonstrate compliance with the Commission's solicitation process.

Together, the 2017 IRP, this Application, and the accompanying testimony demonstrate that the proposed significant energy resource decision—Wind Projects—and resource decision—Transmission Projects—are in the public interest.

VI. PROPOSED PROCEDURAL SCHEDULE

To achieve commercial operation of the Combined Projects by 2020, the Company requests that the Commission adopt the following schedule, with a final decision by March 30, 2018:

June 30, 2017	Application Filed
July 7, 2017	Scheduling Conference
July 31, 2017	Technical Conference
November 17, 2017	Intervenor Testimony Due
December 15, 2017	RMP Rebuttal Testimony on Transmission
January 9, 2018	Sur-rebuttal Testimony Due
January 16, 2018	RMP Supplemental with RFP Results
January 26, 2018	Intervenor Supplemental Testimony on New Wind
February 7, 2018	RMP Rebuttal on New Wind
February 12, 2018	Hearings Begin
March 30, 2018	Target Order Issued

VII. REQUEST FOR RELIEF

WHEREFORE, the Company requests relief as follows:

1. That the Commission hold a scheduling conference to set a schedule for interested persons to file comments and reply comments on the requests for approval of a significant energy resource decision and a resource decision, for any technical conferences deemed useful to the Commission or interested parties, for a hearing on this request, and for other processes and procedures deemed reasonable or necessary by the Commission in determining to approve these requests. The Company's proposed schedule provides for a full review of this filing.

2. That the Commission issue an order pursuant to Utah Code Ann. §§ 54-17-302 and 54-17-402 approving the Company's significant energy resource decision to acquire the 860 MW Wind Projects and resource decision to construct the Transmission Projects. Rocky Mountain Power will authorize construction as soon as the Commission grants the approval and other regulatory and permitting requirements are met.

3. That the Commission approve a new deferral and cost recovery RTM, under Utah Code Ann. §§ 54-4-1, 54-4-23, 54-17-303 and 54-17-402 and -403, to address the proper ratemaking treatment of the Combined Projects.

DATED this 30th day of June, 2017.

Respectfully submitted,

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Attorneys for Rocky Mountain Power

ATTACHMENT A

R746-430-2(a)-(i) Information Location Matrix for Wind Facilities

Paragraph	Filing Requirement	Testimony and Exhibits
(a)	Information to demonstrate the utility has complied with the requirements of the Energy Resource Procurement Act and Commission rules	1. *Prefiling Public Notice of Intent to File Application For Approval of a Significant Energy Resource Decision and Voluntary Request For Approval of Resource Decision*, filed June 23, 2017. 2. Teply testimony 3. Link testimony 4. Upon completion of the 2017R RFP, the Company will provide additional testimony demonstrating compliance.
(b)	Information to demonstrate whether approval of the selected Significant Energy Resource is in the public interest	1. Teply testimony 2. Link testimony
(c)	Information regarding the solicitation process, if the Significant Energy Resource was solicited through a solicitation process, including, but not limited to: (i) Summaries of all bids received; (ii) Summaries of the Affected Utility's rankings and evaluations of bids; (iii) Copies of all reports relating to the solicitation process made by an independent evaluator who may have been involved with the solicitation process; (iv) A copy of the complete Commission approved Solicitation with appendices, attachments and drafts, if applicable; and (v) A signed acknowledgment from a utility officer involved in the solicitation that to the best of his or her knowledge, the utility fully observed and complied with the requirements of the Commission's rules or statutes	Upon completion of the 2017R RFP, the Company will provide additional testimony demonstrating compliance.

(d)	Identification of all information, data, models and analyses used by the Affected Utility to evaluate the acquisition of the Significant Energy Resource if the acquisition is pursuant to Section 54-17-201(3), or to evaluate and rank bids and the selected resource, if the acquisition is by a solicitation process pursuant to Section 54-17-201(2)	1. Link testimony 2. Upon completion of the 2017R RFP, the Company will provide additional testimony demonstrating compliance
(e)	Contracts proposed for execution or use in connection with the acquisition of the Significant Energy Resource and identification of matters for which contracts are being negotiated or remain to be negotiated	1. Teply testimony 2. Upon completion of the 2017R RFP, the Company will provide additional testimony demonstrating compliance.
(f)	Information on the estimated costs for the Significant Energy Resource, including but not limited to engineering studies, data, and models used in the analysis, and any other costs which the utility considers recoverable pursuant to Section 54-17-303	1. Teply testimony 2. Link testimony 3. Larsen testimony
(g)	An analysis of the estimated effects the Significant Energy Resource will have on the Affected Utility's revenue requirement	1. Link testimony 2. Larsen testimony
(h)	Financial information demonstrating adequate financial capability to obtain the Significant Energy Resource pursuant to the proposed acquisition	Crane testimony
(i)	Identification of all other relevant information in support of the requested approval	1. Crane testimony 2. Teply testimony 3. Link testimony 4. Larsen testimony

R746-440-1(1)(a)-(k) Information Location Matrix for Transmission Facilities

Paragraph	Filing Requirement	Testimony and Exhibits
(a)	A description of the Resource decision	Vail testimony
(b)	Information to demonstrate that the Energy utility has complied with the applicable requirements of the Act and Commission rules	1. *Prefiling Public Notice of Intent to File a Voluntary Request for Approval of Significant Energy Resource Decision*, filed June 23, 2017. 2. Vail testimony 3. Link testimony
(c)	The purposes and reasons for the Resource decision	Vail testimony
(d)	An analysis of the estimated or projected costs of the Resource decision, including the engineering studies, data, information and models used in the Energy utility's analysis	1. Vail testimony 2. Link testimony
(e)	Descriptions and comparisons of other resources or alternatives evaluated or considered by the Energy utility, in lieu of the proposed Resource decision	Link testimony
(f)	Sufficient data, information, spreadsheets, and models to permit an analysis and verification of the conclusions reached and models used by the Energy utility	Link testimony
(g)	An analysis of the estimated effect of the Resource decision on the Energy utility's revenue requirement	1. Link testimony 2. Larsen testimony
(h)	Financial information demonstrating adequate financial capability to implement the Resource decision	Crane testimony
(i)	Major contracts, if any, proposed for execution or use in connection with the Resource decision	Vail testimony
(j)	Information to show that the Energy utility has or will obtain any required authorization from the appropriate governmental bodies for the Resource decision	Vail testimony
(k)	Other information as the Commission may require	No other information has currently been requested.

Rocky Mountain Power
Docket No. 17-035-40
Witness: Cindy A. Crane

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

Direct Testimony of Cindy A. Crane

June 2017

Q. Please state your name, business address, and present position.

A. My name is Cindy A. Crane. My business address is 1407 West North Temple, Suite 310, Salt Lake City, Utah 84116. I am the President and Chief Executive Officer of Rocky Mountain Power ("Company"), a division of PacifiCorp.

Q. Briefly describe your professional experience.

A. I joined the Company in 1990 and have served as Director of Business Systems Integration, Managing Director of Business Planning and Strategic Analysis, Vice President of Strategy and Division Services, and Vice President of Interwest Mining Company and Fuel Resources. My responsibilities in these positions included the management and development of PacifiCorp's 10-year business plan, directing operations of the Energy West Mining and Bridger Coal companies, and coal supply acquisition and fuel management for PacifiCorp's coal-fired generating plants. In October 2014, I was appointed to my present position as President and Chief Executive Officer of Rocky Mountain Power.

Q. Have you testified in previous regulatory proceedings?

A. Yes. I have filed testimony with the public service commissions in all of the states where the Company serves customers, including the Utah Public Service Commission ("Commission").

PURPOSE AND SUMMARY OF TESTIMONY

Q. What is the purpose of your testimony?

A. My testimony details the Company's proposal to invest $2 billion in new wind and transmission facilities, all of which would be operational by December 31, 2020, as required to leverage the full benefit of the federal wind production tax credit ("PTC"),

the value of which is essential to the combined projects' overall economic viability. The Wind Projects and Transmission Projects, as defined and described below, are the cornerstones of PacifiCorp's Energy Vision 2020 strategy. These projects represent an exciting opportunity for PacifiCorp's customers, who we expect to realize approximately $137 million in benefits over time, with initial rate impacts of less than 1.9 percent.

My testimony provides an overview of the Company's Application, which includes a request for an order under Utah Code Ann. § 54-17-302 approving the Company's "significant energy resource decision" to construct or procure four new Wyoming wind resources with a total capacity of 860 megawatts ("MW") (collectively, the "Wind Projects"). The Application also includes a request for an order under Utah Code Ann. § 54-17-402 approving the Company's "resource decision" to construct the Aeolus-to-Bridger/Anticline Line and the 230 kV Network Upgrades, as defined and discussed in more detail later (collectively, "Transmission Projects"). I explain why these resource decisions are prudent and in the public interest, and describe the financial ability of the Company to invest in the proposed facilities.

Q. Please summarize your testimony.

A. The Wind Projects and Transmission Projects (collectively, "Combined Projects") are central to the Company's current long-term energy strategy, Energy Vision 2020, under which the Company plans to use the opportunities presented by the extension of the federal PTC to make major resource investments that provide significant savings to customers over the lives of the resources. The Company identified and presented this opportunity in its 2017 Integrated Resource Plan ("2017 IRP").

The Transmission Projects and Wind Projects are mutually dependent on one another. The Wind Projects rely on the Transmission Projects for interconnection to the Company's transmission system. In turn, the Transmission Projects are supported by the key economic attributes of the Wind Projects: zero-fuel-cost generation that lowers net power costs and provides ten years of PTCs. The Wind Projects also generate renewable energy certificates ("RECs"), which can be sold in the market and lower net customer costs. The Wind Projects help decarbonize the Company's resource portfolio, mitigating long-term risk associated with potential future state and federal policies targeting carbon dioxide ("CO_2") emissions reductions from the electric sector.

The Transmission Projects also provide significant benefits to customers. The Aeolus-to-Bridger/Anticline Line is a sub-segment of the Company's Energy Gateway West transmission project, and is an integral component of the long-term transmission plan for the region. The Company, with stakeholder involvement, has pursued permitting of the Energy Gateway West transmission project, which includes the Aeolus-to-Bridger/Anticline line, since 2008. The Transmission Projects relieve congestion on the current transmission system in eastern Wyoming, provide critical voltage support to the Wyoming transmission network, improve overall reliability of the transmission system, enhance the Company's ability to comply with mandated reliability and performance standards, reduce line losses, and create the potential for further increases to the transfer capability across the Aeolus-to-Bridger/Anticline Line with the construction of additional segments of the Energy Gateway project.

Timing is critical for both of these projects. The Combined Projects must achieve commercial operation by the end of 2020 to qualify for the full benefits of the

PTCs and maintain favorable economics. Thus, the Company must move quickly, particularly on the Transmission Projects, which will take several years to fully permit, obtain the necessary rights-of-way, and construct. To complete construction of the Combined Projects by December 31, 2020, the Company requests that the Commission adopt the proposed, expedited schedule for review set forth in the Application.

Because of the time-sensitivity of the Combined Projects, the Company is conducting its 2017R Request for Proposals ("2017R RFP") process simultaneously with its request for approval of the Wind Projects. Although unusual, this approach is necessary in this case. If the Company waited until the conclusion of the 2017R RFP to seek approval, the Combined Projects could not be completed by the end of 2020, and customers would lose significant PTC benefits. To allow the Combined Projects to move forward, the Company has pursued the Wind Projects, which will be benchmark resources in the 2017R RFP and proxy resources for purposes of this Application until the 2017R RFP is completed.

The Company also requests approval of the ratemaking treatment for the Combined Projects. The Company proposes to match the costs and benefits of the Combined Projects through the Resource Tracking Mechanism ("RTM") until the costs and benefits are reflected in base rates. Variances in PTCs would continue to be tracked through the RTM after all other costs and a base level of PTCs are reflected in base rates. This proposed ratemaking treatment will ensure that the costs and benefits of the Combined Projects are properly matched and customers and shareholders are treated fairly while delivering long-term benefits.

Using medium price and CO_2 assumptions, the Company's economic analysis demonstrates a present-value reduction in revenue requirement due to the Combined Projects of $137 million over the life of the projects, with a year-one rate impact of less than 1.9 percent.

Q. What other witnesses will be testifying on behalf of the Company?

A. In addition to my testimony, the Company's Application is supported by the testimony of the following witnesses:

Mr. Chad A. Teply, Vice President of Strategy and Development, provides a detailed description of the Company's proposed acquisition of the Wind Projects. Mr. Teply describes the Wind Projects, addresses the impact and timing of PTCs on their acquisition, and provides information to respond to the requirements of Utah Admin. Code R746-430-2 for the Wind Projects.

Mr. Rick A. Vail, Vice President of Transmission, outlines the need for the Transmission Projects, and provides a detailed description of the transmission facilities. Mr. Vail also addresses the requirements of Utah Admin. Code R746-440-1 for the Transmission Projects.

Mr. Rick T. Link, Vice President of Resource and Commercial Strategy, testifies regarding the economic analysis that supports the prudence of the Combined Projects, and describes the customer benefits resulting from the timely acquisition and construction of the wind and transmission facilities. Mr. Link explains the planning and analysis of the Combined Projects in the Company's 2017 IRP. He also provides background on the pending 2017R RFP for the wind resources.

Mr. Jeffrey K. Larsen, Vice President of Regulation, explains the Company's proposal for ratemaking treatment of the costs and benefits of the Combined Projects, including introducing a new tariff, Schedule 97B – Resource Tracking Mechanism, and the inter-jurisdictional allocation of costs.

Q. Has the Company developed a schedule that allows the Commission to process this case in an orderly and expeditious manner?

A. Yes. The Company's proposed expedited schedule is included in the Application.

Q. Is the Company requesting approval of the Projects in any other states?

A. Yes. Concurrent with this Application, the Company is requesting approval of the Combined Projects from the Wyoming Public Service Commission and the Idaho Public Utilities Commission. There are rate-recovery mechanisms in Oregon and Washington for investments in renewable resources that provide a path to seek recovery of the costs and benefits of the Combined Projects closer in time to project completion. In California, the Company is required to file a general rate case in 2019, which may include the costs and benefits of the Combined Projects; alternatively, California's Post-Test Year Adjustment Mechanism may be used to recover costs incurred after the 2019 general rate case.

OVERVIEW OF COMBINED PROJECTS

Q. Please describe the Transmission Projects.

A. The Transmission Projects include six major elements:

(1) The 140-mile, Aeolus-to-Anticline line, which includes construction of the new Aeolus and Anticline substations;

(2) The five-mile Anticline to Jim Bridger 345 kV line, which includes modifications at the existing Jim Bridger substation to allow termination of the new 345 kV line;

(3) Installation of a voltage control device at the Latham substation;

(4) A new 16-mile 230 kV transmission line parallel to an existing 230 kV line from Shirley Basin substation to the proposed Aeolus substation, including modifications to the existing Shirley Basin substation;

(5) The reconstruction of four miles of an existing 230 kV transmission line between the proposed Aeolus substation and the Freezeout substation, including modifications as required at the Freezeout substation;

(6) The reconstruction of 14 miles of an existing 230 kV transmission line between the Freezeout substation and the Standpipe substation including modifications as required at the Freezeout and Standpipe substations.

Throughout the Company's testimony, items 1-3 above are collectively referred to of the Aeolus-to-Bridger/Anticline Line, and items 4-6 above are collectively referred to as the 230 kV Network Upgrades.

Q. What are the system benefits of the Transmission Projects?

A. The benefits of the Transmission Projects fall into three broad categories. First, the Transmission Projects will relieve congestion in eastern Wyoming, which will allow greater resource interconnection in that part of the state. The Company's current transmission system in eastern Wyoming is operating at capacity, which limits transfer of existing resources from eastern Wyoming and precludes the ability to interconnect additional resources east of the proposed Aeolus-to-Bridger/Anticline Line. The

Transmission Projects will increase the transfer capability from east to west by 750 MW. When the Transmission Projects are complete, they will allow interconnection of up to 1,270 MW of incremental wind resources, including the Wind Projects that are the subject of this Application.

Second, the Transmission Projects will provide critical voltage support to the transmission system in southeastern Wyoming. Under certain operating conditions, voltage control issues have limited the ability to add additional resources, particularly wind resources. The addition of the Transmission Projects will solve the voltage control issues.

Third, the Transmission Projects will also increase reliability, reduce capacity and energy losses on the transmission system, and provide greater flexibility to manage existing generation resources. Currently, outages on the existing 230 kV system in eastern Wyoming result in deration of the transfer capacity in the area and some outage scenarios require significant generation curtailment. The new 500 kV transmission segment will significantly reduce, if not eliminate, many of the impacts caused by the 230 kV outages.

Q. Please describe the proposed Wind Projects.

A. The Company requests approval for the construction or acquisition of 860 MW of new wind resources, which are three 250 MW facilities (referred to as Ekola Flats, TB Flats I, and TB Flats II) and a fourth 110 MW facility (McFadden Ridge II), all located in Wyoming. Mr. Teply's testimony provides additional details on the Wind Projects.

Q. Will the Company submit the Wind Projects into the 2017R RFP?

A. Yes. Each of the resources will be included in the 2017R RFP as a benchmark resource.

Therefore, if other resources are ultimately selected, they will be equal to or better than the Wind Projects in the Application. The Company submits this Application to facilitate review of this time-limited opportunity to secure approval under the expedited schedule proposed by the Company.

Q. What additional information will be provided once the 2017R RFP shortlist is selected?

A. After the 2017R RFP shortlist is selected, the Company supplement this Application to provide the Commission and intervening parties with detailed information about the winning bid(s).

Q. What is the status of the 2017R RFP?

A. The Company filed for acknowledgment or approval of the proposed 2017R RFP with the Commissions in Utah and Oregon, as required in those states. Following those proceedings, the Company anticipates issuing the 2017R RFP to the market in August 2017. The Company plans to complete its final shortlist bid evaluation and finalize the shortlist in early January 2018. Mr. Link's testimony provides additional details on the RFP process.

Q. Why is the Company requesting approval for both the Transmission Projects and Wind Projects?

A. The Projects are mutually dependent on one another. The Transmission Projects are necessary to relieve existing congestion and will enable interconnection of the proposed Wind Projects into the Company's transmission system. The Transmission Projects are not economic without the incremental, cost-effective Wind Projects generating zero-

fuel-cost energy and PTCs. This interdependence requires the Combined Projects' concurrent development.

The renewal of the PTCs has created a unique, time-limited opportunity for the Company to construct critical transmission facilities in eastern Wyoming, while providing substantial customer savings. The economics for the Combined Projects, however, require that they be constructed to meet commercial operation by the end of 2020.

Q. Why must the Combined Projects be in commercial operation by the end of 2020?

A. The substantial customer benefits resulting from the Combined Projects assumes the Wind Projects will qualify for 100 percent of the PTCs. Each of the Wind Projects are eligible for 100 percent of the PTC benefits if the Wind Projects and the Transmission Projects are commercially operational by December 31, 2020. Failing to meet the 2020 deadline puts the Company at risk to lose PTC benefits, and jeopardizes the overall economics of the Combined Projects.

Q. How will the Company achieve commercial operation by the end of 2020?

A. The Company must obtain approval for the Combined Projects under the expedited timelines proposed, so that equipment and engineering, procurement, and construction contracts can be executed shortly thereafter. Because the lead time for constructing the Transmission Projects is longer than the lead time to construct the Wind Projects, the schedules for the Transmission Projects dictate this timeline. The testimonies of Mr. Teply and Mr. Vail provide additional detail on the construction timelines necessary to complete both projects by the end of 2020.

PUBLIC INTEREST

Q. In its 2017 IRP, did the Company select the Combined Projects as part of the preferred resource portfolio?

A. Yes. Both resources are least-cost, least-risk resources, as reflected in the Company's 2017 IRP, filed with the Commission April 4, 2017. The 2017 IRP includes the Wind Projects and Transmission Projects as integral components of the Company's preferred portfolio.

Q. Do the Combined Projects provide significant benefits to customers?

A. Yes. As outlined in Mr. Link's testimony, the Combined Projects will produce customer benefits that significantly outweigh costs. The Company's economic analysis included multiple electricity price and carbon-risk scenarios, measured over several different time periods. In virtually all cases, the Combined Projects result in significant net customer benefits. For example, with medium natural gas and medium CO_2 price assumptions over the life of the facilities, the present-value reduction to the change in revenue requirement due to the Combined Projects is $137 million. Because the Company did not quantify the added benefits associated with RECs, the economic analysis is conservative.

Q. What is the projected rate impact to customers of the Combined Projects?

A. The rate impact to customers is less than 1.9 percent with the first full year of operation in 2021. While this percentage change reflects the year-one impact to customers, it does not fully reflect the value of the Combined Projects due to costs avoided over time. Mr. Link's analysis showing the present-value savings of $137 million through 2050

referenced above demonstrates that although there is an initial increase in cost, the lifetime savings of the Combined Projects are significant.

Q. After the Company filed its IRP in April, did Company representatives meet with Utah stakeholders to provide an overview of the Combined Projects?

A. Yes. From May 9 to 11, 2017, the Company met with various Utah stakeholders to review the details of the Combined Projects, explain the RFP for the wind resources, and discuss the scope and timing of this Application.

Q. In addition to the customer benefits you have already mentioned, do the Combined Projects benefit the public interest in other ways?

A. Yes. The Transmission Projects will relieve transmission constraints that have limited energy resource interconnection in eastern Wyoming. Once constructed, the Transmission Projects will allow the Company to more efficiently deliver cost-effective energy from Wyoming generation resources.

REQUIREMENTS FOR APPROVAL OF RESOURCE DECISIONS

Q. What are the requirements for the Commission to approve the decisions to construct or acquire the Transmission Projects and the Wind Projects?

A. It is my understanding that approval of the "resource decision" to construct the Transmission Projects is subject to Utah Code Ann. § 54-17-402 because "resource decisions" are defined in Utah Code Ann. § 54-17-401 to include those relating to "an energy utility's acquisition, management, or operation of energy production, processing, transmission, or distribution facilities or processes." The Wind Projects, however, are a "significant energy resource," as that term is defined in Utah Code Ann. § 54-17-102(4), because the projects are 100 MW or more of new generating capacity

with a dependable life of 10 or more years. Because the Wind Projects are a "significant energy resource," it is my understanding that the Company must obtain Commission approval under Utah Code Ann. § 54-17-302(1).

While each resource is subject to approval under a different statutory provision, my understanding is that the standards for approval are generally the same. For both decisions, the Commission must determine if the decision is in the public interest after considering the following five factors:

- Whether the decision will most likely result in the acquisition, production, and delivery of utility services at the lowest reasonable cost to the retail customers of the utility;
- Long-term and short-term impacts;
- Risk;
- Reliability;
- Financial impacts on the utility; and
- Other factors determined by the commission to be relevant.

In addition, for the Wind Projects, the Commission must also determine whether the decision was reached in compliance with a Commission-approved solicitation process.

Q. Is the Company's decision to construct or acquire the Combined Projects prudent?

A. Yes. As described above, and in more detail in the testimonies of Messrs. Teply, Vail, and Link, the Combined Projects are the least-cost, least-risk resource option for the Company and will provide substantial customer benefits. Indeed, as discussed above, the Combined Projects will save customers money over the long-term. The Combined

Projects are also consistent with the analysis and modeling in the Company's 2017 IRP, where both resources are included in the near-term action plan as part of the preferred portfolio. Thus, the decision to construct or acquire the Combined Projects will most likely result in the acquisition, production, and delivery of utility services at the lowest reasonable cost to the Company's retail customers.

Q. Will the Transmission Projects increase the reliability of the Company's transmission system?

A. Yes. Mr. Vail's testimony describes the reliability benefits that will result from the construction of the Transmission Projects.

Q. How does the Company intend to finance the Combined Projects?

A. The Company intends to finance the Combined Projects through its normal sources of capital, both internal and external, including net cash flow from operating activities, public and private debt offerings, the issuance of commercial paper, the use of unsecured revolving credit facilities, capital contributions and other sources. Although the Combined Projects are a significant investment on the part of the Company, the financial impact will not impair the Company's ability to continue to provide safe and reliable electricity service at reasonable rates.

Q. How will approval support the Company's current credit rating, thereby providing customer benefits?

A. Ratings agencies consider the Company's regulatory treatment when establishing its credit rating, and particularly focus on the treatment of capital investments. Supportive treatment through approval of an investment of this magnitude provides assurance to ratings agencies and helps maintain the Company's credit rating. A solid credit rating

directly benefits customers by ensuring access to capital markets and reducing immediate and future borrowing costs related to the financing needed to support regulatory operations, and strong ratings will often allow the Company to avoid having to meet costly collateral requirements that are typically imposed on lower-rated companies when securing power in the market. If the Company does not have consistent access to the capital markets at reasonable costs, its debt issuances and the resulting costs of constructing the new facilities become more expensive than they otherwise would be.

Q. Will the Company's construction or acquisition of the Wind Projects comply with a solicitation process approved by the Commission?

A. Yes. The Company has requested approval of the 2017R RFP from the Commission and anticipates issuing the Commission-approved RFP to the market in August 2017. After the 2017R RFP, the Company will provide a supplemental filing in this case reflecting the resources that were ultimately selected and demonstrating that the selected resources were chosen in compliance with the Commission-approved solicitation process.

PROPOSED RATEMAKING TREATMENT

Q. Please describe the Company's proposed ratemaking treatment for the investment in the Combined Projects.

A. The Company proposes a new RTM to address the proper ratemaking treatment to match the costs and benefits of the Combined Projects until the costs and benefits are fully reflected in base rates. This primarily includes new capital and operating costs, net power costs savings not already captured in the Company's Energy Balancing

Account ("EBA"), and PTC benefits. This mechanism will align the costs and benefits so that customers receive the benefits from the Combined Projects while shareholders receive appropriate cost recovery of the prudent investments. Once the costs are fully reflected in base rates, the Company proposes that the mechanism continue to track and true-up PTCs on an ongoing basis because the PTC value is significant and because the wind generation is highly dependent on weather, varying from year-to-year as weather patterns fluctuate, with the actual output beyond the control of the Company. Mr. Larsen's testimony provides additional detail on the proposal and further demonstrates how it is consistent with the public interest.

CONCLUSION

Q. What is your recommendation to the Commission?

A. The Company recommends that the Commission approve the Combined Projects on the timeline requested by the Company. The Combined Projects will provide substantial customer benefits and advance the public interest in Utah. The Company also requests that the Commission approve the Company's proposed ratemaking treatment for the investment in the Combined Projects.

Q. Does this conclude your direct testimony?

A. Yes.

REDACTED
Rocky Mountain Power
Docket No. 17-035-40
Witness: Chad A. Teply

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

REDACTED
Direct Testimony of Chad A. Teply

June 2017

Q. Please state your name, business address, and present position.

A. My name is Chad A. Teply. My business address is 1407 West North Temple, Suite 310, Salt Lake City, Utah 84116. My position is Vice President of Strategy and Development for Rocky Mountain Power ("Company"), a division of PacifiCorp.

QUALIFICATIONS

Q. Briefly describe your education and business experience.

A. I have a Bachelor of Science Degree in Mechanical Engineering from South Dakota State University. I joined MidAmerican Energy Company (a Berkshire Hathaway Energy affiliate company) in November 1999, and held positions of increasing responsibility within the generation organization, including serving as project manager for a new 780 megawatt ("MW") supercritical coal-fueled generation resource placed in service in 2007. In April 2008, I moved to Northern Natural Gas Company (a Berkshire Hathaway Energy affiliate company) as Senior Director of Engineering. I joined PacifiCorp in February 2009. In my current role as Vice President of Strategy and Development, my responsibilities encompass strategic planning, regulatory support, stakeholder engagement, development, and execution of major generation resource additions, major environmental compliance projects, and major transmission projects.

PURPOSE AND SUMMARY OF TESTIMONY

Q. What is the purpose of your testimony?

A. The Company's 2017 Integrated Resource Plan ("2017 IRP") preferred portfolio identified a time-limited opportunity to procure approximately 1,100 MW of cost-

23 effective wind facilities and construct transmission facilities to relieve existing
24 congestion and allow interconnection of those new wind facilities, while providing all-
25 in customer savings. To capture the substantial customer benefits resulting from this
26 time-limited opportunity, the Company has filed a request for an order approving its
27 "significant energy resource decision" for the construction or acquisition of
28 approximately 860 megawatts ("MW") of new wind facilities ("Wind Projects").[1] The
29 Company has secured development and implementation rights for the Wind Projects,
30 which consist of four individual wind facilities located in the state of Wyoming.

31 The Wind Projects rely upon the construction of the Aeolus to Bridger/Anticline
32 transmission line and other associated network upgrades (collectively, the
33 "Transmission Projects"), which will relieve existing congestion and allow
34 interconnection of the Wind Projects.[2] In turn, the benefits generated by the Wind
35 Projects—zero-fuel-cost generation that lowers net power costs and ten years of federal

[1] None of the four wind facilities are qualifying facilities under the Public Utility Regulatory Policies Act. *See* 18 C.F.R. § 292.204 (defining criteria for qualifying facilities).

[2] As more specifically described in the testimony of Mr. Rick A. Vail, the Transmission Projects include: (1) a new 140-mile, 500 kilovolt (kV) transmission line segment and associated infrastructure running from the new Aeolus substation near Medicine Bow, Wyoming, to the new Anticline substation located near the existing Jim Bridger substation, which includes construction of the new Aeolus and Anticline substations; (2) a new five-mile 345 kV transmission line that will extend from the proposed Anticline substation to the existing Jim Bridger substation, which includes modifications at the existing Jim Bridger substation to allow termination of the new 345 kV line; (3) installation of a voltage control device at the Latham substation (items 1 through 3 collectively referred to as the "Aeolus-to-Bridger/Anticline line"); (4) a new 16-mile, 230 kV transmission line running from the Company's existing Shirley Basin substation to the proposed Aeolus substation, which requires modifications to the Shirley Basin substation and interconnection facilities in the new Aeolus substation to accommodate the new line; (5) reconstruction of four miles of an existing 230 kV transmission line between the proposed Aeolus substation and the Freezeout substation, which requires modifications to the Freezeout substation and interconnection facilities in the new Aeolus substation to accommodate the rebuilt line; and (6) reconstruction of 14 miles of an existing 230 kV transmission line between the Freezeout substation and the Standpipe substation, which requires modifications to the Freezeout and Standpipe substations to accommodate the rebuilt line (items 4 through 6 collectively referred to as the "230 kV Network Upgrades").

productions tax credits ("PTCs")—support cost-effective development of the Transmission Projects. Together, the Wind Projects and the Transmission Projects provide significant savings to customers over the lives of the resources.

The Company is now conducting a competitive market renewables request for proposals ("2017R RFP"). Upon conclusion of the 2017R RFP, the Company will confirm the specific wind facilities that it plans to construct or acquire. In its Application, the Company provides detailed information on four wind facilities to meet the Utah Public Service Commission's ("Commission") resource approval requirements. The Company is submitting these four wind facilities as benchmark resources in the 2017R RFP and proxy resources in the Application, pending the final results of the 2017R RFP. My testimony and exhibits provide the information required by Utah Code Ann. § 54-17-302 and Commission Rule 746-430-2(1) related to the Wind Projects.

Q. Please summarize your testimony.

A. My testimony demonstrates that the Company's proposals to construct or acquire approximately 860 MW of new Wind Projects and construct the Transmission Projects (collectively "Combined Projects" or "Projects") are in the public interest, and in the best interest of customers. Together, the Projects provide substantial customer benefits as long as both achieve commercial operation by the end of 2020. My testimony explains how the Company intends to further develop and procure the Wind Projects and why it is necessary to submit the Wind Projects as "proxy" facilities at this time while the Company conducts the 2017R RFP in parallel with this Application.

Q. Why is the Company pursuing the Wind Projects?

A. As further described in the testimonies of Ms. Cindy A. Crane and Mr. Rick T. Link, the Company is pursuing the acquisition and development of the Combined Projects to deliver a time-sensitive opportunity for customers that is identified in the Company's 2017 IRP preferred portfolio (*i.e.*, addition of approximately 1,100 MW of new wind resources and the associated new transmission infrastructure by 2020). The Company has executed the necessary agreements and engaged in the appropriate development activities to ensure that viable Wind Projects to support the Transmission Projects are available and positioned to ensure competitive market engagement, and have directly controllable implementation plans. The Wind Projects support both this Application and the Company's parallel 2017R RFP process.

GENERAL DESCRIPTION OF THE WIND PROJECTS

Q. Please describe the Wind Projects.

A. The Wind Projects information incorporated into this Application is intended to allow the Commission to review the need, economic analyses, and customer benefits of the Wind Projects while the Company's 2017R RFP is pending. The Wind Projects include three nominal 250 MW facilities in Wyoming (referred to as Ekola Flats, TB Flats I, and TB Flats II) that a third-party is currently developing. Each facility will consist of the commensurate number of 2.0 MW to 4.2 MW wind turbine generators to achieve up to a nominal 250 MW nameplate capacity, an electrical collection system, a 34.5 kV to 230 kV collector substation, 230 kV breakers, a 230 kV tie-line between the wind project and the point of interconnection substation, meteorological towers, access

roads, an operations and maintenance ("O&M") building and required communication and control facilities (*e.g.*, metering, hardware, software, and associated communication circuits and other equipment).

The Wind Projects also include a fourth nominal 110 MW wind facility (McFadden Ridge II), which the Company is currently developing on a Company-controlled site in Wyoming. McFadden Ridge II is expected to consist of approximately forty-four 2.3 MW to 2.5 MW wind turbine generators and similar project infrastructure as those described for the 250 MW facilities.

The Wind Projects incorporated into the Application total 860 MW nominally, and represent facilities for which the Company has secured the rights to carry forward through development. The Company will submit the Wind Projects into the 2017R RFP as benchmark proposals, and will construct these facilities if they are the winning bids in the 2017R RFP.

The Wind Projects are estimated to cost approximately [redacted].

Q. Why does the Company's Application request approval of only 860 MW of wind facilities, when the 2017 IRP identified a resource opportunity of approximately 1,100 MW of wind facilities?

A. The Company is seeking approval for only those facilities to which it has development and implementation rights.

Q. Does the Company's economic analysis supporting the Application for the Transmission Projects include approximately 1,100 MW of new wind facilities?

A. Yes. As the testimony of Mr. Link explains, the Company's economic analysis includes

certain known qualifying facilities ("QFs") now in development that are located in the Aeolus area, hold preferential interconnection queue positions, have executed power purchase agreements contracts, and are reasonably expected to be in service by year-end 2021. When these QFs are considered in conjunction with the nominal 860 MW of secured development opportunities, the total generating capacity equates to the 1,180 MW of new wind facilities analyzed in support of this Application.

Q. Please describe the time-sensitive nature of the Combined Projects.

A. The time-sensitive nature of the Combined Projects is primarily driven by the pending phase-out of the federal PTC for new wind resources. In Internal Revenue Code ("IRC") section 45, the U.S. Internal Revenue Service ("IRS") provides for a PTC at the 2017 full rate of 2.4 cents per kilowatt hour of electrical energy production by a wind facility. The PTC is available for a 10-year period that begins when the facility is placed in service. The Protecting Americans from Tax Hikes Act of 2015 ("the PATH Act") extended the availability of the PTC for wind facilities under construction before January 1, 2020. The PATH Act extension, however, also provides for a phase-out of the PTC. Wind facilities that began construction before January 1, 2017, will realize the full PTC credit, which is the case for the Wind Projects in this Application. If a wind facility begins construction in 2017, the PTC is reduced by 20 percent. The PTC is reduced by 40 percent if construction begins in 2018, and by 60 percent if construction begins in 2019. The PTC is not available for wind facilities that begin construction after December 31, 2019.

To receive "safe-harbor" PTCs, the facilities must be placed into commercial

operation by the end of the fourth calendar year following the year in which construction began (the "start-of-construction" standard) or otherwise meet specific IRS requirements for demonstrating the "continuity requirement" throughout the implementation timeline. To mitigate the risk of interpretation associated with the IRS's "continuity requirements," the Wind Projects (or other wind facilities selected in the 2017R RFP that rely on (i) the Transmission Projects and (ii) also began construction prior to January 1, 2017) must be reviewed, approved, implemented, and placed in service by year-end 2020 in accordance with the "start-of-construction" standard, and meeting the "safe harbor" with respect to the "continuity requirement," to be eligible for the full PTC. The Company's Application is designed to meet this schedule and provide customers the full economic benefit of the Combined Projects.

Q. Do the Wind Projects meet the IRS's "start-of-construction" criteria?

A. Yes. The Company acquired, or has the rights to, sufficient wind turbine generator equipment and other facility-specific components for the Wind Projects. To meet the start-of-construction definition for tax purposes, the Company secured the equipment before December 31, 2016. These transactions satisfy the "safe-harbor" requirements under the PTC guidance issued by the IRS.

Q. How does the Company plan to procure the Wind Projects, or other new wind facilities?

A. As discussed in the testimony of Mr. Link, concurrent with the Application, the 2017R RFP will be issued to the competitive market requesting up to 1,270 MW of wind facilities to align with the new resource interconnections enabled by the Transmission

Projects and to facilitate assessment of a wider range of market responses. The Company will submit the Wind Projects as Company benchmark proposals in the 2017R RFP in October 2017. The Company anticipates that the 2017R RFP final shortlist of bids will be determined by mid-January 2018.

The Company will supplement its Application at that time to incorporate the results of the 2017R RFP. Depending on the outcome, the results will: (1) identify the Wind Projects as the winning bids and validate their benefits; (2) identify winning wind facilities that are in addition to the Wind Projects and request approval of those projects; or (3) identify winning wind facilities that have been selected instead of one or more of the Wind Projects and request approval of those facilities. In any scenario, this will result in final wind facility decisions that are assessed as equal to or better than the Wind Projects in the Application.

Q. Why is the Company providing facility-specific information for the Wind Projects in the Application and also planning a supplemental filing in the docket to incorporate the results of the 2017R RFP?

A. The Company's request for approval of the Combined Projects is driven by the time-sensitivity and scale of the filing. If the Company waited until the anticipated conclusion of the 2017R RFP process in early 2018 to begin the resource approval process, the Company would not receive the requested resource approvals for the Transmission Projects and could not complete those projects by year-end 2020. The critical path schedules of the Transmission Projects are the drivers for the proposed procedural schedule for review of the Application, and the Company needs resource

approval by March 30, 2018, to maintain the development schedules. Critical path schedule activities for the Transmission Projects are further described in the testimony of Mr. Vail.

Q. On a stand-alone basis, would the Company's ability to construct the Wind Projects by year-end 2020 be in jeopardy if the Company was prevented from submitting the Application until after completion of the 2017R RFP?

A. No. On a stand-alone basis, the critical path schedule for the Wind Projects could accommodate a resource approval process that follows the 2017R RFP. As noted before, however, the economics of the Wind Projects are only viable with the Transmission Projects and vice versa; the Transmission Projects are critical path.

Q. How did the Company develop the Wind Projects?

A. The Company investigated the transmission interconnection queue in the area of the Transmission Projects and engaged a third-party wind facility developer to identify facilities that held preferred interconnection queue positions, are commercially viable and are reasonably likely to achieve commercial operation by the end of 2020. The Wind Projects have undergone preliminary vetting for interconnection status, permitting, constructability, wind resource performance, and equipment supply.

Q. Does the Company anticipate that it will develop additional information for the Wind Projects presented in the Application?

A. Yes. The Company will continue to work on the Wind Projects to ensure that the Company makes the most competitive benchmark proposals available to customers. The Company will supplement its filing as necessary.

Q. Does the Company's proposed procedural process allow the Company to support its Application with market-based information?

A. Yes. The Company will demonstrate the economic benefits of the Combined Projects with all available competitive market-based information. The concurrent development of the Wind Projects and the 2017R RFP process will enable the Company to validate the reasonableness of the winning facilities based on current market information.

Q. Does the Company's submittal of benchmark resources in the 2017R RFP preclude other competitive market proposals from being selected for implementation?

A. No. The Company has assessed and identified only a portion of the competitive market wind facilities that are reasonably assumed to be viable considering interconnection, permitting, construction, performance, and implementation. The Company expects robust competitive market response to the 2017R RFP, and selection of any facility that is successful in that process.

Q. Has the Company filed applications with the Wyoming Industrial Siting Council ("ISC") for the Wind Projects?

A. No. The Company intends to submit applications to the Wyoming ISC for any Company benchmarks selected as successful bids in the 2017R RFP following completion of that process. The Company expects that the ISC review process and hearings will proceed through October 2018. The ISC is required to hold a hearing within ninety days of application under W.S. § 35-12-109.

DEVELOPMENT OF WIND PROJECTS

Q. Has the Company performed preliminary evaluations of the wind potential at each Wind Project site?

A. Yes. Studies completed by the Company indicate that the each of the Wind Project sites are suitable for a wind facility. The Ekola Flats and TB Flats I and II sites are adjacent to the Company's existing Dunlap and Seven Mile Hill wind projects. The McFadden Ridge II facility is an expansion of the Company's High Plains/McFadden Ridge wind facility. Wind data collected from existing operations and the area of the Wind Projects indicate that these sites have favorable wind regimes suitable for high performance wind resources.

Q. Has the Company determined who will be responsible for construction of the Wind Projects?

A. No. The Company has not currently identified who will be responsible for constructing the Wind Projects. The Company will issue a competitive procurement request for proposals to obtain firm fixed pricing to engineer, procure, construct and commission each wind facility. The Company will do this as part of its development process for the benchmark proposals.

Q. Has the Company determined who will supply the wind turbine generators for the Wind Projects?

A. Not entirely. As discussed above, the Company has acquired or has rights to acquire "safe-harbor" wind turbine generator equipment and other project-specific components, which it proposes to use at the Wind Projects as required to meet the IRS's

"start-of-construction" criteria. The Company intends to secure rights to procure "follow on" wind turbine generator equipment through a competitive procurement request for proposals. As with the Company benchmark contractor solicitation process, this effort will be performed as part of the development process for the benchmark proposals.

Q. Will the Company seek confidential treatment of specific information regarding the Wind Projects, including cost, performance, technical and commercial information?

A. Yes. The Wind Projects represent only a portion of the wind resources that the Company expects to investigate for possible acquisition or development in response to the 2017R RFP. Information specific to the Wind Projects includes pricing and performance data from wind turbine generator suppliers and third-party project developers that is commercially sensitive and is considered proprietary and highly confidential. As such, project-specific cost, performance, technical and commercial information, as well as other data, must be maintained as proprietary and highly confidential information. This is in the best interest of customers because potential counterparties may use such information to the disadvantage of customers in the bi-lateral proposals and negotiations for other wind resource assets, sites, equipment, services (*i.e.*, construction, or O&M services) or in competitive request for proposals processes.

Q. How did the Company generate the cost information for construction, operation, and maintenance of the individual wind facilities through their useful life?

A. The Company prepared its capital cost estimates for the Wind Projects using

information from a variety of sources. The Company obtained wind turbine costs from a competitive procurement process that was held in 2016 to procure the Company's "safe harbor" wind turbine generator equipment.

Development costs reflect negotiated fees with the third-party project developer for Ekola Flats and TB Flats I and II. The Company developed the balance of plant engineering, procurement, construction, and commissioning costs using a cost model similar to that used to develop supply side resource capital costs for the 2017 IRP.

The Company took the transmission interconnection costs from the respective wind facility's transmission studies. Internal project management and permitting costs were estimated based upon the Company's experience with construction of past wind facilities and other recent generation resource additions.

The Company applied contingencies in various cost categories to account for project uncertainties given the current stage of development of the Wind Projects. O&M cost estimates were developed based upon Company's experience with wind resource O&M budgets and third-party contracts for the Company's existing wind facilities. Ongoing capital costs were estimated based upon the Company's experience and indicative costs provided by wind turbine generator suppliers for critical capital components.

Q. Does the Company have any incentive to inflate the costs of the Wind Projects incorporated into the Application?

A. No. As discussed earlier in my testimony, and in the testimony of Mr. Link, the purpose of the Company's application is to demonstrate the overall customer benefit of the

Combined Projects, and to further substantiate those benefits with the results of the 2017R RFP. With the inherent competitive market comparison to the RFP bids underlying the process, there is no incentive or way for the Company to inflate the costs, with recognition of the need for certain contingencies due to the current state of development of the Wind Projects.

Q. Will the Wind Projects' wind turbine generators or associated infrastructure be built in Wyoming's Greater Sage Grouse Core area?

A. No. The Wind Projects' wind turbine generators and associated infrastructure, including the associated 230 kV interconnection tie-lines, will not be located within the current boundaries of Wyoming's Greater Sage Grouse Core area.

Q. Will the Company collaborate with the Wyoming Game and Fish Department, the U.S. Fish and Wildlife Service, and other environmental agencies in developing and implementing the Wind Projects?

A. Yes. The Company has already initiated discussions with the Wyoming Game and Fish Department and the U.S. Fish and Wildlife Service regarding developing and implementing the Wind Projects. The Company, or in some instances the third-party developer, has begun pre-construction usage surveys for various avian, bat, and wildlife species utilizing recommendations from applicable state and federal guideline documents, including the 2012 Land Based Wind Energy Guidelines. The Company will coordinate with county, state, and federal agencies that have jurisdiction over development, permitting, and operations to ensure appropriate environmental and safety measures are implemented throughout the life of the Wind Projects. The

Company is committed to establishing development and implementation schedules and protocols that recognize potential environmental impacts and strive to mitigate them.

Q. How will potential visual and lighting impacts from the Wind Projects be addressed?

A. Wyoming state and county permitting regulations contain requirements that recognize and address potential visual and lighting impacts. The Company will incorporate those applicable measures into the siting, construction, and operations of the Wind Projects as part of the permitting process. Such measures may include: down shielded lighting on project infrastructure, Federal Aviation Administration approved/recommended turbine lighting protocols, active aviation light management, and use of approved turbine paint color schemes.

Q. What is the expected operational life of the Wind Projects?

A. The anticipated operational life of the Wind Projects has been assessed at 30 years for the purposes of the Application, which aligns with the Company's currently approved depreciable life for wind resources. The operational life may be reviewed and extended based on advances in turbine technologies and/or improvements in maintenance processes through the course of the Company's regular depreciation studies and filings.

Q. Will the Wind Projects be decommissioned or repowered at the end of their operational life?

A. The Company may dismantle and reclaim the Wind Projects at the end of their operational life based upon operating permit requirements. Typically, county and state agencies identify the decommissioning requirements during the permitting process,

including expected reclamation efforts and overall decommissioning costs and security requirements. The Company may also consider replacing or upgrading the existing infrastructure at the end of the operational life if conditions (*i.e.*, economics, permitting, customer load needs, etc.) are conducive to reinvestment in the Wind Projects.

Q. When will construction of the Wind Projects begin and end?

A. As described in detail in the exhibits attached to my testimony, site construction of the Wind Projects will begin as soon as the fourth quarter of 2019. The Company will not begin construction, however, until it has received all of the necessary regulatory approvals and applicable permits and authorizations from other local, state, tribal or federal governmental agencies that have jurisdiction over the construction or operation of the Wind Projects, including approval from the ISC and conclusion of the 2017R RFP to ensure that the projects ultimately selected are in the best interest of customers. The Company anticipates that substantial completion, under normal construction circumstances, weather conditions, labor availability and materials delivery, will be achieved by November 15, 2020.

Q. Please explain why the Wind Projects are in the public interest.

A. The information and analysis in the Company's 2017 IRP and in this Application demonstrate that the Company meets the public interest standard as articulated in Utah Code Annotated § 54-17-302(3)(c). The Wind Projects are in the public interest because: (1) they will become an essential element of the Company's diversified resource portfolio that is needed to serve customers; (2) the facilities are desirable due to location-specific attributes; and (3) the Wind Projects will benefit customers as a

whole.

REQUIREMENTS OF COMMISSION RULE 746-430-2(1)

Q. Please summarize how the Company's Application meets the requirements for approval of a significant energy resource.

A. Commission Rule 746-430-2(1) describes what must be included in an application for approval of a significant energy resource. As such, I have incorporated exhibits to my testimony that provide information for the Wind Projects pertaining to R746-430-2(1)(a), (b), (e) and (f) requirements. The other requirements under Rule 746-430-2(1) are addressed in the testimony of the other witnesses supporting the Application.

Q. Please describe your exhibits for the nominal 250 MW Ekola Flats facility that provide the information required by Commission Rule 746-430-2(1).

A. Information for the nominal 250 MW Ekola Flats facility is included in Confidential Exhibit RMP___(CAT-1) to my testimony. Confidential Exhibit RMP___(CAT-1) Subparts are identified as follows:

- Highly Confidential Exhibit CAT1-1—Wind Turbine Generator Site Layout
- Highly Confidential Exhibit CAT1-2—Wind Turbine Generator Scope of Supply Example
- Confidential Exhibit CAT1-3—Balance of Plant Scope of Work Template
- Confidential Exhibit CAT1-4—Capital Costs Detail
- Confidential Exhibit CAT1-5—Incremental Operational and Maintenance and Ongoing Capital Costs Detail
- Confidential Exhibit CAT1-6—Indicative Project Execution Schedule

- Highly Confidential Exhibit CAT1-7—Preliminary Project Map
- Confidential Exhibit CAT1-8—Geotechnical Report
- Confidential Exhibit CAT1-9—Preliminary Topographical Map
- Confidential Exhibit CAT1-10—Preliminary Scenic Byways, Recreational Areas, National Parks, and State Parks Review
- Highly Confidential Exhibit CAT1-11—Preliminary Cultural and Paleontological Resources Review
- Confidential Exhibit CAT1-12—Preliminary Wildlife and Plant Species of Potential Concern Review
- Confidential Exhibit CAT1-13—Preliminary Aviation and Airspace Review
- Confidential Exhibit CAT1-14—Interconnection Facilities Study
- Confidential Exhibit CAT1-15—Preliminary Local, State, Federal, and Tribal Requirements Review

Q. Please describe the exhibits to your testimony for the nominal 250 MW TB Flats I wind facility and the nominal 250 MW TB Flats II wind facility provide the information required by Commission Rule 746-430-2(1).

A. Information for the nominal 250 MW TB Flats I wind facility and the nominal 250 MW TB Flats II wind facility is included in Confidential Exhibit RMP___(CAT-2) to my testimony. Confidential Exhibit RMP___(CAT-2) Subparts CAT2-1 through CAT2-16 are provided with the similar reference material designations as the CAT1 Exhibit Subparts listed above. The required information for these two facilities is incorporated into one set of exhibits due to the contiguous development and adjacent locations of

the facilities.

Q. Please describe the exhibits for the nominal 110 MW McFadden Ridge II wind facility that provide the information required by Commission Rule 746-430-2(1).

A. Information for the nominal 110 MW McFadden Ridge II wind facility is included in Exhibit RMP___(CAT-3) to my testimony. Exhibit RMP___(CAT-3) Subparts CAT3-1 through CAT3-17 are provided with similar reference material designations as the CAT1 and CAT2 Exhibit Subparts listed above.

Q. Do you propose to file supplemental testimony and exhibits to address certain requirements of Commission Rule 746-430-2(1) upon completion of the 2017R RFP?

A. Yes. My supplemental testimony and exhibits will address additional information required by 746-430-2(1)(a), (b), (e) and (f) as soon as that information is available upon completion of the 2017R RFP.

CONCLUSION AND RECOMMENDATION

Q. Please summarize your recommendation to the Commission.

A. I recommend that the Commission determine that the Wind Projects, or the alternative or additional wind facilities that result from the 2017R RFP, provide significant benefits to customers and therefore are in the public interest. Based on this conclusion, I recommend that the Commission grant the Company's request for approval of the Wind Projects, or alternatives that result from the 2017R RFP, at the conclusion of these proceedings.

Q. Does this complete your direct testimony?

A. Yes.

REDACTED
Rocky Mountain Power
Exhibit RMP___(CAT-1)
Docket No. 17-035-40
Witness: Chad A. Teply

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

REDACTED
Exhibit Accompanying Direct Testimony of Chad A. Teply

Information and Subpart Exhibits for the Ekola Flats Proxy Project

June 2017

Information and Subpart Exhibits For the Ekola Flats Proxy Project

In support of its application, the Company provides the following information and subpart exhibits for the Ekola Flats proxy project.

(A) The name and address of the applicant:

This information is provided in the application.

(B) The type of plant, property, or facility proposed to be constructed or acquired:

PacifiCorp proposes to construct an approximately 250 megawatt wind generation facility located on a site that consists of approximately 17,000 acres of leased private and state land located in Carbon County, Wyoming.

(C) A description of the facilities proposed to be constructed or acquired, including preliminary engineering specifications in sufficient detail to properly describe the principal systems and components, and final and complete engineering specifications when they become available:

The Ekola Flats facility will consist of wind turbine generators ("WTGs"), an electrical collector system, a collector substation, access roads, tower foundations, an operations/maintenance building, fiber optic and/or microwave communication equipment, supervisory control and operating status data acquisition ("SCADA") control equipment, and an approximately seven-mile interconnecting 230 kilovolt ("kV") transmission tie-line. The anticipated point of interconnection will be at the proposed Aeolus 230 kV substation in Carbon County. The WTGs are anticipated to be purchased from competing suppliers, and the balance of project work will be competitively bid and executed under an engineer, procure and construct ("EPC") contract.

An overview of WTG placement across the proposed project site is presented in Highly Confidential Exhibit CAT1-1. WTG placement will continue to evolve based on several factors, including: land acquisition, field-identified sensitive environmental areas, field-identified cultural areas, landowner commentary received from future WTG placement reviews, definitive geotechnical site studies, aviation/air space impact reviews, and wind resource characteristics.

Highly Confidential Exhibit CAT1-2 is provided as an example of certain extractions from a WTG purchase agreement.

Confidential Exhibit CAT1-3 is provided as an example of a technical specification for the scope of work included in a balance-of-project EPC contract.

(D) List the rates, if any, proposed to be charged for the service that will be rendered because of the proposed construction or acquisition:

The rates proposed to be charged for the service rendered as a result of the project are the applicable standard service schedules, rules, and regulations in the Company's Utah tariffs, and as may be modified and approved by the Commission in the future.

(E) State the estimated total cost of the proposed construction or acquisition:

At the time of filing, the total estimated project cost for the Ekola Flats facility is approximately [redacted], including capital surcharge and allowance for funds used during construction. This total estimated project cost includes the associated directly assigned transmission costs, but does not include any incremental interconnection network upgrade costs that are assumed to be the responsibility of the transmission provider. Project cost details are summarized in Confidential Exhibit CAT1-4.

(F) State the manner by which the proposed construction or acquisition will be financed:

The Company intends to finance the proposed wind project through its normal sources of capital, both internal and external, including net cash flow from operating activities, public and private debt offerings, the issuance of commercial paper, the use of unsecured revolving credit facilities, capital contributions and other sources. The financial impact of the proposed investment will not impair the Company's ability to continue to provide safe and reliable electricity service at reasonable rates. In addition, preapproval of the Company's resource decision provides important regulatory support for the Company's current credit rating. This is described in more detail in Ms. Cindy A. Crane's testimony.

(G) Documentation of the financial condition of the applicant:

Rocky Mountain Power's ("RMP") current financial condition is on file with the Commission in response to the annual reporting requirements and through RMP's semi-annual earnings reports or its general rate case application. PacifiCorp is financially capable of funding this project.

(H) The estimated annual operating revenues and expenses that are expected to accrue from the proposed construction or acquisition, including a comparison of the overall effect on the applicant's revenues and expenses:

PacifiCorp provides the economic analysis presented in Mr. Link's testimony and exhibits, which show the revenue stream and expenses associated with the proxy wind projects and demonstrates that the project is a risk-adjusted, least-cost alternative to serve customer loads.

The approximate operational, maintenance and ongoing capital costs expected as a result of this project are presented in Confidential Exhibit CAT1-5. Wind lease royalty costs are included in these amounts. Routine maintenance of the WTGs will be necessary to maximize performance

and detect potential malfunctions. Operational and maintenance ("O&M") procedures will be established in accordance with the WTG manufacturer's recommendations. Scheduled maintenance will be conducted approximately every six months on each WTG. Substations, step-up transformers, and pad-mounted transformers will be maintained as part of normal operating activities. Periodic maintenance of underground collection lines will also be required. No substantial quantities of industrial materials will be brought onto or removed from the site during execution of O&M tasks. Project operation will use lubricants, oils, grease, antifreeze, degreasers, and hydraulic fluids, which will be stored in approved containers and located above ground. During operation, it is also anticipated that hazardous waste generation will be either zero or minimal. A minimal amount of energy will be required to operate the project. O&M costs reported include labor, employee expenses, materials, and contracts.

(I) The estimated start and completion dates of the proposed construction or date of acquisition:

PacifiCorp proposes to begin engineering and construction of the project in April 2018. The proposed project commercial operation (in-service) date is November 2020, under normal construction circumstances, weather conditions, labor availability, materials delivery, and permit and agreement processing durations. An indicative project execution schedule is provided as Confidential Exhibit CAT1-6.

(J) A description of the proposed site, including the county or counties in which the facility will be located, with a metes and bounds description, and a description of the terrain where the facility will be constructed:

The project footprint spans [redacted]

[redacted]. The town of Medicine Bow is located [redacted] to the southeast of the project area. The project site varies in elevation, with a representative elevation of approximately 6,550 feet above mean sea level. Mountain elevations in the area rise to approximately 8,300 feet. The site drainage follows the path of Muddy Creek and tributaries, which are tributary to the Medicine Bow River that joins the North Platte River at the Seminoe Reservoir located to the northwest. Highly Confidential Exhibit CAT1-7 presents a map of area surface ownership, along with a table that provides the legal description of the project location.

(K) A geological report of the proposed site, including foundation conditions, groundwater conditions; operating mineral deposits within a one-mile radius and a topographical map showing the area within a five-mile radius:

Confidential Exhibit CAT1-8 is a geotechnical report for the Dunlap Ranch Wind Energy facility and is provided as proxy geological and foundation information for the Ekola Flats facility. Regional geologic conditions are summarized within the Dunlap geotechnical report.

Also, according to the U.S. Geological Survey Digital Geologic Map of Wyoming, the project area intersects fifteen geologic formations. These include: the Chugwater Formation, Clovery Formation, Ferris Formation, Frontier Formation, Goose Egg Formation, Lewis Shale, Medicine Bow Formation, Mesaverde Formation, Mowry Shales, Niobrara Formation, Steele Shale, Wind River Formation, Sundance Formation, Tensleep Sandstone Formation, and Amsden Formation.

The project area is anticipated to be within the Lower Cretaceous aquifer. Groundwater wells in the area vary in depth from 45 to 99 feet below ground surface ("bgs"), with well static water levels ranging from three to 20 feet bgs.

PacifiCorp will continue to assess the impacts of any operating mineral deposits approximately within a one-mile radius of the facility. This project is not expected to affect operating mineral deposits or oil and gas leases.

A topographical map showing the terrain of the surrounding area within a five-mile radius of the facility is provided as Confidential Exhibit CAT1-9.

(L) A description of and plans for protecting the surrounding scenic, historical, archeological and recreational locations; natural resources; plant and animal life; and land reclamation, including: (I) A general description of the devices to be installed at the major utility facility to protect air, water, chemical, biological and thermal qualities; (II) The designed and tested effectiveness of such devices; and (III) The operational conditions for which the devices were designed and tested:

Confidential Exhibit CAT1-10 provides information on nearby area scenic byways, recreational locations, national parks, and state parks; and visual simulation photos of the completed project area. To the east of the project site, located along Wyoming Highway 487, is the historic Sand Creek Massacre Trail. The trail was dedicated on August 16, 2006. The trail exists in Wyoming as a memorial to the Arapaho and Cheyenne who lost their lives at the Sand Creek Massacre in Colorado in 1864. Impacts to visual resource concerns should be minimal because of the rural setting of the project. The WTGs are not anticipated to significantly degrade the surrounding scenic quality of the area.

PacifiCorp has preliminarily sited project components to mitigate potential environmental and natural resource impacts in the project area. This effort will continue as project details emerge. Highly Confidential Exhibit CAT1-11 provides information on known cultural and paleontological resources at the project site. The preliminary project layout has been arranged to avoid impacts to cultural resources. Additionally, no project related features will be developed in close proximity to known cultural resources. As part of PacifiCorp's plan for protecting the environment, sensitivity practices would be adhered to and any cultural resources would be afforded appropriate protection if discovered during design and construction.

The project has the flexibility to microsite major project features to avoid or significantly reduce impacts to jurisdictional waters of the U.S. and wetlands. More importantly, no adverse impacts to wetland and water resource bodies are anticipated for this project. Any impact to wetlands and the waters of the U.S., should they arise, will be minimized using best management practices.

The project area lies within the Rolling Sagebrush Steppe, Foothill Shrublands, and Low Mountains Ecoregions. Within these areas, Wyoming big sagebrush, rabbitbrush, prickly pear, wheatgrass, and fescues are common. In rock outcrop areas, juniper and mountain mahogany are also expected. The lowland plain zones, a variable brush layer of tall big sagebrush, greasewood, bunchgrasses, forbs, and prickly pear have been observed. In upland areas, mountain big sagebrush, mountain mahogany, bunchgrasses, forbs, and prickly pear/pincushion cacti have been observed. Occasionally, more diverse riparian communities are present along spring-fed draws, where red willow, chokecherry, currants, various tall grasses, various reeds, forb varieties, thistle, Indian paintbrush are present. Currently, no rare or unique vegetative communities are documented

or have been mapped within the project area. Therefore, it is not anticipated that the project will contribute to degradation of these resources.

Wild animals including mule deer, whitetail deer, pronghorn antelope, coyotes, chipmunks, prairie dogs, ground squirrels, and rattlesnakes have been observed. Birds including red-tailed hawks, golden eagles, bald eagles, nighthawks, sparrows and various songbirds have been observed. Construction of the project will potentially cause temporary displacement of individuals for some wildlife species that would move on in response to project activities, and lead to permanent impacts to wildlife.

Estimated bird mortality at the site would likely be similar to, or less than, other wind generation facilities located in the area.

Two occupied greater sage-grouse leks are located within the project footprint. The occupied leks are located in [redacted].

PacifiCorp will continue to collect bat data within the proposed project area.

Wildlife and plant species of potential concern that continue to be assessed are presented in Confidential Exhibit CAT1-12, including U.S. Fish and Wildlife Service listed species, Wyoming Game and Fish Department species of greatest conservation need, and Bureau of Land Management sensitive species.

At the end of project life, PacifiCorp will have reserved funds in its asset retirement obligation ("ARO") account and will use ARO funding to restore the site to near natural conditions.

Lands disturbed during construction would be reclaimed to current conditions to the extent practicable. Ground disturbance would be minimized and best management practices employed by the construction contractors to minimize environmental impacts. PacifiCorp would also employ an environmental inspector(s) to ensure that environmental considerations, and any unforeseen

environmental incidents, are appropriately addressed. This individual would ensure prompt and appropriate response to any identified non-compliance situations and ensure environmental protections are appropriately implemented. Periodic environmental audits of the site will also be conducted by PacifiCorp affiliated personnel that are independent of the project team.

During construction, each on-site contractor will be expected to develop, publish and orchestrate a site- and project-specific environmental protection plan.

Site specific wildlife management plans will be developed and implemented.

(M) A description of any potential safety hazards:

Prevention of safety hazards and impacts from failure of the project's components will be achieved by a combination of planning and controlled site access. By following industry guidelines and WTG certification processes, the most safe and reliable facility will be constructed. WTGs are equipped with multiple safety systems as standard equipment. For example, rotor speed is controlled by a redundant pitch control system and a backup disk brake system. Critical components have multiple temperature sensors and a control system to shut the system down and take it off-line if overheating conditions are detected. Lightning protection is a standard feature on the WTGs, and a specially engineered lightning protection and site grounding system will be installed for the project.

Turbine towers, tower foundations, and above-ground transmission line support structures will be designed according to applicable building codes and nationally accepted design standards to avoid failure or collapse. The selected WTG and tower combination will be subjected to engineering review to ensure that the design and construction specifications are appropriate for the project. This review will include consideration of code/nationally accepted design standard requirements under various anticipated worst-case loading conditions and will provide a high

degree of confidence in the structural adequacy of the towers. The WTGs have been preliminarily sited at locations which exceed a reasonable set-back of over one tip-height.

During active construction, PacifiCorp will follow the manufacturers' recommended handling instructions and erection procedures to prevent material damage to towers or blades that could lead to failure. In addition, certification of the WTGs to the requirements of the *International Electrotechnical Commission ("IEC") 61400-1* standard will ensure that the static, dynamic, and defined-life fatigue stresses in the blades will not be exceeded under the combined load combinations expected at the project site. The standard includes safety factors for normal, abnormal, fatigue, and construction loads. This certification, together with regular periodic inspections, will give a high level of assurance against blade failure during operation.

The WTGs will be sited at locations that exceed a reasonable set-back distance to safeguard against ice throw. Ice throw over long distances has not been documented as a hazard, and no ice throw injury has been reported from existing wind generation projects. Icing is a rare event, and the turbines for this project will be situated in a remote area.

During construction, planned construction safety controls include (1) a "PacifiCorp Safety Plan," and (2) the EPC contractor's "Site Specific Safety Plan."

The feasibility of the project site from an aviation and airspace point of view is presented in Confidential Exhibit CAT1-13. The WTGs will be grouped in strings, and some of the WTGs will include aviation warning lights, as required by the Federal Aviation Agency ("FAA"). The number of WTGs with lights and the lighting pattern of the WTGs will be determined through collaboration with the FAA.

(N) A description of the real property, fuel and water requirements, including any source of water along which the major utility facility will be constructed or from which it will obtain or return water:

There are no fuel, minerals, or process water requirements for this project.

The project will be constructed in the vicinity and above the Medicine Bow River drainage.

At the time of this filing, it is anticipated that during project construction, water will be obtained from a municipal water source, an existing senior water rights holder and trucked to the site, or a new well with a permit issued by the Wyoming State Engineer's Office to appropriate groundwater. Once available on-site, water will either be put to immediate use or placed in an on-site temporary water storage tank. Once the project is in operation, only minimal daily domestic water use will be required. The primary domestic water requirement will occur at the O&M building, and is anticipated to be limited to consumption in restrooms, sinks, washing station(s), showers, internal/external hose use, and as dishwater.

A septic system and drain field for sanitary sewer waste disposal will be provided once the project is operational.

(O) The acquisition status, source and location of real property, rights-of-way, fuel and water requirements:

Property and rights-of-way acquisition status was mentioned previously. There are no fuel acquisition requirements for this project. A groundwater use application will be applied from the Wyoming State Engineer's Office for a new extraction well.

(P) The proposed means of transporting fuel and water requirements:

There is no process-related requirement to transport material quantities of fuel and water for this project.

(Q) A description of all mineral rights associated with the facility and plans for addressing any split-estate issues:

PacifiCorp will not own any of the subsurface rights at the site. The Company does not believe that any subsurface right holder will be able to unreasonably displace the resource or any portion of the resource.

PacifiCorp has done prudent legal research on its rights as a surface lease holder, as compared to those of subsurface right holders, and is comfortable that the law does not allow subsurface right holders to unilaterally displace the Company's facilities and that any subsurface right holder would be required to enter into good faith negotiations to reasonably accommodate its subsurface extraction objective.

(R) A statement setting forth the need for the facility in meeting present and future demands for service in Utah and other states:

Development of the proposed wind generation facility in compliance with regulatory requirements is the risk-adjusted, least-cost alternative to meet service obligations in Utah and other states as represented in the Company's testimony and exhibits. The Company's prospective generation planning activities are further described in the Company's 2017 Integrated Resource Plan, which was submitted to the Commission in compliance with Commission Rules.

(S) A description of the commodity or service the facility will make available:

The project will generate electricity using wind as the renewable energy source. Fossil fuel consumption and waste residual disposal obligations will be avoided.

(T) A statement of the facilities effect on the applicant's and other systems' stability and reliability:

This project is not expected to adversely affect the quality, stability, and reliability of the

PacifiCorp transmission system or that of other entities. A large-generator interconnection "Facilities Study Report" is provided as Confidential Exhibit CAT1-14 that summarizes the expected impact.

(U) The status of satisfying local, state, tribal or federal governmental agency requirements. The applicant shall immediately fill all agencies' final orders:

A list of the local, state, tribal, and federal governmental agencies having requirements known at the time of this application, which PacifiCorp must meet in connection with the construction and operation of the project is listed, along with their timing and status, in Confidential Exhibit CAT1-15. Any unforeseen permit requirements will be adequately addressed.

By applying to and working with the various agencies for the construction/operation permits, the major regulatory requirements and critical reviews for the project are being addressed. PacifiCorp's contractors may provide certain permits including permits for construction storm water pollution prevention control, compliance with building regulations through the Carbon County Planning and Zoning Commission, sanitary sewer extensions, and requirements of the Wyoming Department of Transportation. PacifiCorp will monitor and audit the successful completion, maintenance and closeout of all contractor supplied permits.

The following documents included in Exhibit RMP___(CAT-1) are confidential or highly confidential in their entirety:

Highly Confidential Exhibit CAT1-1	Ekola Flats Proxy WTG Site Layout
Highly Confidential Exhibit CAT1-2	WTG Scope of Supply Example
Confidential Exhibit CAT1-3	Balance of Plant Scope of Work Template
Confidential Exhibit CAT1-4	Ekola Flats Proxy Capital Costs Detail
Confidential Exhibit CAT1-5	Ekola Flats Proxy Incremental O&M and Ongoing Capital Costs Detail
Confidential Exhibit CAT1-6	Ekola Flats Indicative Project Execution Schedule
Highly Confidential Exhibit CAT1-7	Ekola Flats Preliminary Project Map
Confidential Exhibit CAT1-8	Ekola Flats Proxy Geotechnical Report
Confidential Exhibit CAT1-9	Ekola Flats Preliminary Topographical Map
Confidential Exhibit CAT1-10	Ekola Flats Preliminary Scenic Byways, Recreational Areas, National Parks, and State Parks Review
Highly Confidential Exhibit CAT1-11	Ekola Flats Preliminary Cultural and Paleontological Resources Review
Confidential Exhibit CAT1-12	Ekola Flats Preliminary Wildlife and Plant Species of Potential Concern Review
Confidential Exhibit CAT1-13	Ekola Flats Preliminary Aviation and Airspace Review
Confidential Exhibit CAT1-14	Ekola Flats Interconnection Facilities Study
Confidential Exhibit CAT1-15	Ekola Flats Preliminary Local, State, Federal, and Tribal Requirements Review

Note: The confidential and highly confidential exhibits referenced above are provided subject to Utah Public Service Commission Rules R746-1-602 and 603.

The highly confidential exhibits contain commercially sensitive information which is considered business confidential information subject to Utah Code 63G-2-305(2) and 63G-2-305(3) to protect it from a Government Records Access and Management Act (GRAMA) request. The Company requests special handling. Please contact Bob Lively at (801) 220-4052 to make arrangements to review.

REDACTED
Rocky Mountain Power
Exhibit RMP___(CAT-2)
Docket No. 17-035-40
Witness: Chad A. Teply

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

REDACTED
Exhibit Accompanying Direct Testimony of Chad A. Teply

Information and Subpart Exhibits for the TB Flats I and TB Flats II Proxy Projects

June 2017

Information and Subpart Exhibits For the TB Flats I and TB Flats II Proxy Projects

In support of its application, the Company provides the following information and subpart exhibits for the TB Flats I and TB Flats II proxy projects.

(A) The name and address of the applicant:

This information is provided in the application.

(B) The type of plant, property, or facility proposed to be constructed or acquired:

PacifiCorp proposes to construct two separate approximately 250-megawatt wind generation facilities, designated as TB Flats I and TB Flats II, located on a site that consists of approximately 41,000 acres of leased private and state land located in Carbon and Albany Counties, Wyoming. At the time of filing, division of the site into the specific areas for the TB Flats I and TB Flats II projects has not yet occurred.

(C) A description of the facilities proposed to be constructed or acquired, including preliminary engineering specifications in sufficient detail to properly describe the principal systems and components, and final and complete engineering specifications when they become available:

The TB Flats I and TB Flats II facilities will each consist of wind turbine generator(s) ("WTGs"), an electrical collector system, a collector substation, access roads, tower foundations, an operations / maintenance building, fiber optic and / or microwave communication equipment, and supervisory control and operating status data acquisition ("SCADA") control equipment. For the TB Flats I project, the facility includes approximately four miles of an interconnecting 230 kilovolt ("kV") transmission tie-line. The anticipated point of interconnection will be at a new substation on the Shirley Basin-Freezeout transmission line at 230 kV in Carbon County. For the

TB Flats II project, the facility includes approximately four miles of an interconnecting 230 kV transmission tie-line. The anticipated point of interconnection will be at the Shirley Basin substation at 230 kV in Carbon County. The WTGs are anticipated to be purchased from competing suppliers, and the balance-of-project work will be competitively bid and executed under an engineer, procure and construct ("EPC") contract.

An overview of WTG placement across the proposed project sites is presented in Highly Confidential Exhibit CAT2-1. WTG placement will continue to evolve based on several factors, including: land acquisition, field-identified sensitive environmental areas, field-identified cultural areas, landowner commentary received from future WTG placement reviews, definitive geotechnical site studies, aviation / air space impact reviews, and wind resource characteristics.

Highly Confidential Exhibit CAT2-2 is provided as an example of certain extractions from a WTG purchase agreement.

Confidential Exhibit CAT2-3 is provided as an example of a technical specification for the scope of work included in a balance-of-project EPC contract.

(D) List the rates, if any, proposed to be charged for the service that will be rendered because of the proposed construction or acquisition:

The rates proposed to be charged for the service rendered as a result of the project are the applicable standard service schedules, rules, and regulations in the Company's Utah tariffs, and as may be modified and approved by the Commission in the future.

(E) State the estimated total cost of the proposed construction or acquisition:

At the time of filing, the total estimated project cost for the TB Flats I facility is approximately [redacted], including capital surcharge and allowance for funds used during construction. This total estimated project cost includes the associated directly assigned

transmission costs, but does not include incremental interconnection network upgrade costs that are assumed to be the responsibility of the transmission provider.

At the time of filing, the total estimated project cost for the TB Flats II facility is approximately [redacted], including capital surcharge and allowance for funds used during construction. This total estimated project cost includes the associated directly assigned transmission costs, but does not include incremental interconnection network upgrade costs that are assumed to be the responsibility of the transmission provider.

Project cost details for each site are summarized in Confidential Exhibit CAT2-4.

(F) State the manner by which the proposed construction or acquisition will be financed:

The Company intends to finance the proposed wind projects and transmission facilities through its normal sources of capital, both internal and external, including net cash flow from operating activities, public and private debt offerings, the issuance of commercial paper, the use of unsecured revolving credit facilities, capital contributions and other sources. The financial impact of the proposed wind and transmission facilities are a significant investment on the part of the Company, the financial impact will not impair the Company's ability to continue to provide safe and reliable electricity service at reasonable rates. In addition, preapproval of the Company's resource decision provides important regulatory support for the Company's current credit rating. This is described in more detail in Ms. Cindy A. Crane's testimony.

(G) Documentation of the financial condition of the applicant:

Rocky Mountain Power's ("RMP") current financial condition is on file with the Commission in response to the annual reporting requirements and through RMP's semi-annual

earnings reports or its general rate case application. PacifiCorp is financially capable of funding these projects.

(H) The estimated annual operating revenues and expenses that are expected to accrue from the proposed construction or acquisition, including a comparison of the overall effect on the applicant's revenues and expenses:

PacifiCorp provides the economic analysis presented in Mr. Link's testimony and exhibits which show the revenue stream and expenses associated with the proxy wind project and which demonstrates that the project is a risk-adjusted, least-cost alternative to serve customer loads.

The approximate operational, maintenance, and ongoing capital costs expected as a result of each project are presented in Confidential Exhibit CAT2-5. Wind lease royalty costs are included in these amounts. Routine maintenance of the WTGs will be necessary to maximize performance and detect potential malfunctions. Operational and maintenance ("O&M") procedures will be established in accordance with the WTG manufacturer's recommendations. Scheduled maintenance will be conducted approximately every six months on each WTG. Substations, step-up transformers, and pad-mounted transformers will be maintained as part of normal operating activities. Periodic maintenance of underground collection lines will also be required. No substantial quantities of industrial materials will be brought onto or removed from the site during execution of O&M tasks. Project operation will use lubricants, oils, grease, antifreeze, degreasers, and hydraulic fluids, which will be stored in approved containers and located above ground. During operation, it is also anticipated that hazardous waste generation will be either zero or minimal. A minimal amount of energy will be required to operate the project. O&M costs reported include labor, employee expenses, materials, and contracts.

(I) The estimated start and completion dates of the proposed construction or date of acquisition:

PacifiCorp proposes to begin engineering and construction of the project in April 2018. The proposed project commercial operation (in-service) operating date is November 2020, under normal: construction circumstances, weather conditions, labor availability, materials delivery, and permit / agreement processing durations. An indicative project execution schedule for each project is provided as Confidential Exhibit CAT2-6.

(J) A description of the proposed site, including the county or counties in which the facility will be located, with a metes and bounds description, and a description of the terrain where the facility will be constructed:

For both projects, the site footprint spans [redacted]. The town of Medicine Bow is located [redacted] south of the project south boundary. The project site varies in elevation, with a representative elevation of approximately 6,700 feet above mean sea level. Mountain elevations in the area rise to approximately 8,300 feet. The site drainage follows the path of Muddy Creek and tributaries, which are tributary to the Medicine Bow River that joins the North Platte River at the Seminoe Reservoir located to the northwest. Highly Confidential Exhibit CAT2-7 presents a map of area surface ownership, along with a table that provides the legal description of the project location.

(K) A geological report of the proposed site, including foundation conditions, groundwater conditions; operating mineral deposits within a one-mile radius and a topographical map showing the area within a five-mile radius:

Confidential Exhibit CAT2-8 is a geotechnical report for the Dunlap Ranch Wind Energy facility and is provided now as proxy geological and foundation information for the TB Flats I and TB Flats II facilities. Regional geologic conditions are summarized within the Dunlap geotechnical report.

Also, according to the U.S. Geological Survey Digital Geologic Map of Wyoming, the project area intersects fifteen geologic formations. These include the: Chugwater Formation, Clovery Formation, Ferris Formation, Frontier Formation, Goose Egg Formation, Lewis Shale, Medicine Bow Formation, Mesaverde Formation, Mowry Shales, Niobrara Formation, Steele Shale, Wind River Formation, Sundance Formation, Tensleep Sandstone Formation, and Amsden Formation.

The project area is anticipated to be within the Lower Cretaceous aquifer. Groundwater wells in the area varies in depth from 45 to 99 feet below ground surface ("bgs"), with well static water levels ranging from three to 20 feet bgs.

PacifiCorp will continue to assess the impacts of any operating mineral deposits approximately within a one mile radius of the facility. This project is not expected to affect operating mineral deposits or oil and gas leases.

A topographical map showing the terrain of the surrounding area within a five-mile radius of the facility is provided as Confidential Exhibit CAT2-9.

(L) A description of and plans for protecting the surrounding scenic, historical, archeological and recreational locations; natural resources; plant and animal life; and land reclamation, including: (I) A general description of the devices to be installed at the major utility facility to protect air, water, chemical, biological and thermal qualities; (II) The designed and tested effectiveness of such devices; and (III) The operational conditions for which the devices were designed and tested:

Confidential Exhibit CAT2-10 provides information on nearby area scenic byways, recreational locations, national parks, and state parks; visual simulation photos of the completed project areas. To the east of the project site, located along Wyoming Highway 487, is the historic Sand Creek Massacre Trail. The trail was dedicated on August 16, 2006. The trail exists in Wyoming as a memorial to the Arapaho and Cheyenne who lost their lives at the Sand Creek Massacre in Colorado in 1864. Impacts to visual resource concerns should be minimal because of the rural setting of the project. The WTGs are not anticipated to significantly degrade the surrounding scenic quality of the area.

PacifiCorp has preliminarily sited project components to mitigate potential environmental and natural resource impacts in the project area. This effort will continue as details for each project emerges.

Highly Confidential Exhibit CAT2-11 provides information on known cultural and paleontological resources at the project sites. The preliminary project layout has been arranged to avoid impacts to cultural resources. Additionally, no project-related features will be developed in close proximity to known cultural resources. As part of PacifiCorp's plan for protecting the environment, sensitivity practices would be adhered to and any cultural resources would be afforded appropriate protection if discovered during design and construction.

Each project has the flexibility to "microsite" major project features to avoid or significantly reduce impacts to jurisdictional waters of the U.S. and wetlands. More importantly, no adverse impacts to wetland and water resource bodies are anticipated for these projects. Any impact to wetlands and the waters of the U.S., should they arise, will be minimized using best management practices.

The project area lies within the Rolling Sagebrush Steppe, Foothill Shrublands, and Low Mountains Ecoregions. Within these areas, Wyoming big sagebrush, rabbitbrush, prickly pear, wheatgrass, and fescues are common. In rock outcrop areas, juniper and mountain mahogany are also expected. The lowland plain zones, a variable brush layer of tall big sagebrush, greasewood, bunchgrasses, forbs, and prickly pear have been observed. In upland areas, mountain big sagebrush, mountain mahogany, bunchgrasses, forbs, and prickly pear / pincushion cacti have been observed. Occasionally, more diverse riparian communities are present along spring-fed draws, where red willow, chokecherry, currants, various tall grasses, various reeds, forb varieties, thistle, Indian paintbrush are present. Currently, no rare or unique vegetative communities are documented or have been currently mapped within the project area. Therefore, it is not anticipated that each project will contribute to degradation of these resources.

Wild animals including mule deer, whitetail deer, pronghorn antelope, coyotes, chipmunks, prairie dogs, ground squirrels, and rattlesnakes have been observed. Birds including red-tailed hawks, golden eagles, bald eagles, nighthawks, sparrows and various songbirds have been observed. Construction of the project will potentially cause temporary displacement of individuals for some wildlife species that would move on in response to project activities, and lead to permanent impacts to wildlife.

Estimated bird mortality at the site would likely be similar to, or less than, other wind generation facilities located in the area.

No currently occupied greater sage-grouse leks are located within project area.

PacifiCorp will continue to collect bat data within the proposed project area.

Wildlife and plant species of potential concern that continue to be assessed are presented in Confidential Exhibit CAT2-12, including U.S. Fish and Wildlife Service listed species, Wyoming Game and Fish Department species of greatest conservation need, and Bureau of Land Management sensitive species.

At the end of project life, PacifiCorp will have reserved funds in its asset retirement obligation ("ARO") account and will use ARO funding to restore the site to near natural conditions.

Lands disturbed during construction would be reclaimed to current conditions to the extent practicable. Ground disturbance would be minimized and best management practices employed by the construction contractors to minimize environmental impacts. PacifiCorp would also employ an environmental inspector(s) to ensure that environmental considerations, and any unforeseen environmental incidents, are appropriately addressed. This individual would ensure prompt and appropriate response to any identified non-compliance situations and ensure environmental protections are appropriately implemented. Periodic environmental audits of the site will also be conducted by PacifiCorp affiliated personnel that are independent of the project team.

During construction, each on-site contractor will be expected to develop, publish, and orchestrate a site and project specific environmental protection plan.

Site specific wildlife management plans will be developed and implemented.

(M) A description of any potential safety hazards:

Prevention of safety hazards and impacts from failure of the project's components will be

achieved by a combination of planning and controlled site access. By following industry guidelines and WTG certification processes, the most safe and reliable facility will be constructed. WTGs are equipped with multiple safety systems as standard equipment. For example, rotor speed is controlled by a redundant pitch control system and a backup disk brake system. Critical components have multiple temperature sensors and a control system to shut the system down and take it off-line if overheating conditions are detected. Lightning protection is a standard feature on the WTGs, and a specially engineered lightning protection and site grounding system will be installed for the project.

Turbine towers, tower foundations, and above-ground transmission line support structures will be designed according to applicable building codes and nationally accepted design standards to avoid failure or collapse. The selected WTG and tower combination will be subjected to engineering review to ensure that the design and construction specifications are appropriate for the project. This review will include consideration of code / nationally accepted design standard requirements under various anticipated worst case loading conditions and will provide a high degree of confidence in the structural adequacy of the towers. The WTGs have been preliminarily sited at locations which exceed a reasonable set-back of over one tip-height.

During active construction, PacifiCorp will follow the manufacturers' recommended handling instructions and erection procedures to prevent material damage to towers or blades that could lead to failure. In addition, certification of the WTG to the requirements of the *International Electrotechnical Commission ("IEC") 61400-1* standard will ensure that the static, dynamic, and defined-life fatigue stresses in the blades will not be exceeded under the combined load combinations expected at the project site. The standard includes safety factors for normal,

abnormal, fatigue, and construction loads. This certification, together with regular periodic inspections, will give a high level of assurance against blade failure during operation.

The WTGs will be sited at locations that exceed a reasonable set-back distance to safeguard against ice throw. Ice throw over long distances has not been documented as a hazard, and no ice throw injury has been reported from existing wind generation projects. Icing is a rare event, and the turbines for this project will be situated in a remote area.

During construction, planned construction safety controls include: (1) a "PacifiCorp Safety Plan," and (2) the EPC contractor's "Site Specific Safety Plan."

The feasibility of each project site from an aviation and airspace point of view is presented in Confidential Exhibit CAT2-13. The WTGs will be grouped in strings, and some of the WTGs will include aviation warning lights, as required by the Federal Aviation Agency ("FAA"). The number of WTGs with lights and the lighting pattern of the WTGs will be determined through collaboration with the FAA.

(N) A description of the real property, fuel and water requirements, including any source of water along which the major utility facility will be constructed or from which it will obtain or return water:

There are no fuel, minerals, or process water requirements for this project.

The projects will be constructed in the vicinity and above the Medicine Bow River drainage.

At the time of this filing, it is anticipated that during construction of the projects, water will be obtained from a municipal water source; an existing senior water rights holder and trucked to the site; or a new well with a permit issued by the Wyoming State Engineer's Office to appropriate groundwater. Once available on-site, water will either be put to immediate use or placed in an on-

site temporary water storage tank. Once the project is in operation, only minimal daily domestic water use will be required. The primary domestic water requirement will occur at the operations / maintenance building, and is anticipated to be limited to consumption in restrooms, sinks, washing station(s), showers, internal / external hose use, and as dishwater.

A septic system and drain field for sanitary sewer waste disposal will be provided once the project is operational.

(O) The acquisition status, source and location of real property, right-of-way, fuel and water requirements:

Property and right-of-way acquisition status was mentioned previously. There are no fuel acquisition requirements for these projects. Groundwater use applications will be applied for from Wyoming State Engineer's Office for each new extraction well.

(P) The proposed means of transporting fuel and water requirements:

There is no process related requirement to transport material quantities of fuel and water for these projects.

(Q) A description of all mineral rights associated with the facility and plans for addressing any split-estate issues:

PacifiCorp will not own any of the subsurface rights at the site. The Company does not believe that any subsurface right holder will be able to unreasonably displace the resource or any portion of the resource.

PacifiCorp has completed prudent legal research on its rights as a surface lease holder, as compared to those of subsurface right holders, and is comfortable that the law does not allow subsurface right holders to unilaterally displace the Company's facilities and that any subsurface

right holder would be required to enter into good faith negotiations to reasonably accommodate its subsurface extraction objective.

(R) A statement setting forth the need for the facility in meeting present and future demands for service in Utah and other states:

Development of the proposed wind generation facilities in compliance with regulatory requirements is the risk-adjusted, least-cost alternative to meet service obligations in Utah and other states as represented in the Company's testimony and exhibits. The Company's forward looking generation planning activities are further described in the Company's 2017 IRP in compliance with Commission Rules.

(S) A description of the commodity or service the facility will make available:

The project will generate electricity using wind as the renewable energy source. Fossil fuel consumption and waste residual disposal obligations will be avoided.

(T) A statement of the facilities effect on the applicant's and other systems' stability and reliability:

Each project is not expected to adversely affect the quality, stability, and reliability of the PacifiCorp transmission system or that of other entities. A large generator-interconnection "Facilities Study Report" is provided as Confidential Exhibit CAT2-14 that summarizes the expected impact for the TB Flats I facility.

A large-generator interconnection "Facilities Study Report" is provided as Confidential Exhibit CAT2-15 that summarizes the expected impact for the TB Flats II facility.

(U) The status of satisfying local, state, Tribal or federal governmental agency requirements. The applicant shall immediately fill all agencies' final orders:

A list of the local, state, Tribal, and federal governmental agencies having requirements

known at the time of this application, which PacifiCorp must meet in connection with the construction and operation of each project is listed, along with their timing and status, in Confidential Exhibit CAT2-16. Any unforeseen permit requirements will be adequately addressed.

By applying to and working with the various agencies for the construction / operation permits and the Commission, pursuant to Commission rules, the major regulatory requirements and critical reviews for the project are being addressed. PacifiCorp's contractors may provide certain permits including permits for construction storm water pollution prevention control, compliance with building regulations through the Carbon County Planning and Zoning Commission, Albany County Planning and Zoning Commission, sanitary sewer extensions, and requirements of the Wyoming Department of Transportation. PacifiCorp will monitor and audit the successful completion, maintenance and closeout of all contractor supplied permits.

The following documents included in Exhibit RMP___(CAT-2) are confidential or highly confidential in their entirety:

Highly Confidential Exhibit CAT2-1	TB Flats Proxy WTG Site Layout
Highly Confidential Exhibit CAT2-2	WTG Scope of Study Example
Confidential Exhibit CAT2-3	Balance of Plant Scope of Work Template
Confidential Exhibit CAT2-4	TB Flats I and TB Flats II Proxy Capital Costs Detail
Confidential Exhibit CAT2-5	TB Flats I and TB Flats II Proxy Incremental O&M and Ongoing Capital Costs Detail
Confidential Exhibit CAT2-6	TB Flats Indicative Project Execution Schedule
Highly Confidential Exhibit CAT2-7	TB Flats Preliminary Project Map
Confidential Exhibit CAT2-8	TB Flats Proxy Geotechnical Report
Confidential Exhibit CAT2-9	TB Flats Preliminary Topographical Map
Confidential Exhibit CAT2-10	TB Flats Preliminary Scenic Byways, Recreational Areas, National Parks, and State Parks Review
Highly Confidential Exhibit CAT2-11	TB Flats Preliminary Cultural and Paleontological Resources Review
Confidential Exhibit CAT2-12	TB Flats Preliminary Wildlife and Plant Species of Potential Concern Review
Confidential Exhibit CAT2-13	TB Flats Preliminary Aviation and Airspace Review
Confidential Exhibit CAT2-14	TB Flats I Interconnection Facilities Study
Confidential Exhibit CAT2-15	TB Flats II Interconnection Facilities Study
Confidential Exhibit CAT2-16	TB Flats Preliminary Local, State, Federal, and Tribal Requirements Review

Note: The confidential and highly confidential exhibits referenced above are provided subject to Utah Public Service Commission Rules R746-1-602 and 603.

The highly confidential exhibits contain commercially sensitive information which is considered business confidential information subject to Utah Code 63G-2-305(2) and 63G-2-305(3) to protect it from a Government Records Access and Management Act (GRAMA) request. The Company requests special handling. Please contact Bob Lively at (801) 220-4052 to make arrangements to review.

REDACTED
Rocky Mountain Power
Exhibit RMP___(CAT-3)
Docket No. 17-035-40
Witness: Chad A. Teply

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

REDACTED
Exhibit Accompanying Direct Testimony of Chad A. Teply

Information and Subpart Exhibits for the McFadden Ridge II Proxy Project

June 2017

Information and Subpart Exhibits For the McFadden Ridge II Proxy Project

In support of its application, the Company provides the following information and subpart exhibits for the McFadden Ridge II proxy projects.

(A) The name and address of the applicant:

This information is provided in the application.

(B) The type of plant, property, or facility proposed to be constructed or acquired:

PacifiCorp proposes to construct an additional approximately 110 megawatts of wind generation capacity adjacent to its existing High Plains / McFadden Ridge I wind generation facility. This lateral expansion project (McFadden Ridge II) is located to the south and exclusively consists of approximately 6,000 acres of leases private and state land in Carbon and Albany Counties, Wyoming. Note that the proposed infrastructure will not require the use of any federal public lands, managed by the Bureau of Land Management.

(C) A description of the facilities proposed to be constructed or acquired, including preliminary engineering specifications in sufficient detail to properly describe the principal systems and components, and final and complete engineering specifications when they become available:

The McFadden Ridge II facility will consist of wind turbine generator(s) ("WTGs"), an electrical collector system, a collector substation, access roads, tower foundations, fiber optic and/or microwave communication equipment, and supervisory control and operating status data acquisition ("SCADA") control equipment, and an approximately three-mile interconnecting 230 kilovolt ("kV") transmission tie-line that will interconnect at the existing Foote Creek Rim substation. The WTGs are anticipated to be purchased from competing suppliers, and the balance-

of-project work will be competitively bid and executed under an engineer, procure and construct ("EPC") contract.

Maps of the proposed project area are presented in Highly Confidential Exhibit CAT3-1, along with an overview of WTG placement across the site. WTG placement will continue to evolve based on several factors, including: land acquisition, field-identified sensitive environmental areas, field-identified cultural areas, landowner commentary received from future WTG placement reviews, definitive geotechnical site studies, aviation/air space impact reviews, and wind resource characteristics.

Highly Confidential Exhibit CAT3-2 is provided as an example of certain extractions from a WTG purchase agreement.

Confidential Exhibit CAT3-3 is provided as an example of a technical specification for the scope of work included in the balance of project EPC contract.

(D) List the rates, if any, proposed to be charged for the service that will be rendered because of the proposed construction or acquisition:

The rates proposed to be charged for the service rendered as a result of the project are the applicable standard service schedules, rules, and regulations in the Company's Utah tariffs, and as may be modified and approved by the Commission in the future.

(E) State the estimated total cost of the proposed construction or acquisition:

At the time of filing, the total estimated project cost for the McFadden Ridge II facility is approximately [redacted], including capital surcharge and allowance for funds used during construction. This total estimated project cost includes the associated directly assigned transmission costs, but does not include any incremental interconnection network upgrade costs

that are assumed to be the responsibility of the transmission provider. Project cost details are summarized in Confidential Exhibit CAT3-4.

(F) State the manner by which the proposed construction or acquisition will be financed:

The Company intends to finance the proposed wind projects and transmission facilities through its normal sources of capital, both internal and external, including net cash flow from operating activities, public and private debt offerings, the issuance of commercial paper, the use of unsecured revolving credit facilities, capital contributions and other sources. The financial impact of the proposed wind and transmission facilities are a significant investment on the part of the Company, the financial impact will not impair the Company's ability to continue to provide safe and reliable electricity service at reasonable rates. In addition, preapproval of the Company's resource decision provides important regulatory support for the Company's current credit rating. This is described in more detail in Ms. Cindy A. Crane's testimony.

(G) Documentation of the financial condition of the applicant:

Rocky Mountain Power's ("RMP") current financial condition is on file with the Commission in response to the annual reporting requirements and through RMP's semi-annual earnings reports or its general rate case application. PacifiCorp is financially capable of funding this project.

(H) The estimated annual operating revenues and expenses that are expected to accrue from the proposed construction or acquisition, including a comparison of the overall effect on the applicant's revenues and expenses:

PacifiCorp provides the economic analysis presented in Mr. Link's testimony and exhibits which show the revenue stream and expenses associated with the proxy wind projects and

demonstrates that the project is a risk-adjusted, least-cost alternative to serve customer loads.

The approximate operational, maintenance and ongoing capital costs expected as a result of this project are presented in Confidential Exhibit CAT3-5. Wind lease royalty costs are included in these amounts. Routine maintenance of the WTGs will be necessary to maximize performance and detect potential malfunctions. Operational and maintenance ("O&M") procedures will be established in accordance with the WTG manufacturer's recommendations. Scheduled maintenance will be conducted approximately every six months on each WTG. Substations, step-up transformers, and pad-mounted transformers will be maintained as part of normal operating activities. Periodic maintenance of underground collection lines will also be required. No substantial quantities of industrial materials will be brought onto or removed from the site during execution of O&M tasks. Project operation will use lubricants, oils, grease, antifreeze, degreasers, and hydraulic fluids, which will be stored in approved containers and located above ground. During operation, it is also anticipated that hazardous waste generation will be either zero or minimal. A minimal amount of energy will be required to operate the project. O&M costs reported include labor, employee expenses, materials, and contracts.

(I) The estimated start and completion dates of the proposed construction or date of acquisition:

PacifiCorp proposes to begin engineering and construction of the project in April 2018. The proposed project commercial operation (in-service) operating date is November 2020, under normal construction circumstances, weather conditions, labor availability, materials delivery, and permit and agreement processing durations. An indicative project execution schedule is provided as Confidential Exhibit CAT3-6.

(J) A description of the proposed site, including the county or counties in which the facility will be located, with a metes and bounds description, and a description of the terrain where the facility will be constructed:

The project footprint spans [redacted]. The town of McFadden is located [redacted] to the west of the project area. The western side of the proposed project is located in Carbon County, and the eastern side in Albany County.

The project lies within the drainage system of Coalbank Creek and its tributaries, which are tributaries to Rock Creek. Rock Creek occurs approximately three miles north of the site. Livestock ranching operations occur on a majority of the proposed project area. The elevation throughout the site ranges from approximately 7,100 to 7,400 feet above mean sea level.

Highly Confidential Exhibit CAT3-7 presents a map of area surface ownership, along with a table that provides the legal description of the project location. The project will be located on leased private fee lands. PacifiCorp will obtain a Special Use Lease from the Wyoming School and Land Board Trust for state-owned parcels within the project boundary.

(K) A geological report of the proposed site, including foundation conditions, groundwater conditions; operating mineral deposits within a one-mile radius and a topographical map showing the area within a five-mile radius:

The North Platte River Basin contains a wide variety of geologic formations and structural elements. Geologic formations vary in thickness and range from crystalline bedrock to alluvial deposits. The project is located in the Laramie Basin, which is a wide intermontane valley situated between the Medicine Bow Mountains to the west and the Laramie Mountains to the east. Bedrock geology in the project area consists of gravel, pediment, and fan deposits; Lewis Shale; the Hanna

Formation; and the Medicine Bow Formation. Gravel, pediment, and fan deposits in the project area are dominated by quartzite, with cobbles, pebbles, and gravels, located close to the ground surface. Lewis Shale is a dark gray marine deposit that crops out along the eastern margins of the Great Divide and Washakie basins in south-central Wyoming. It consists of at least twenty depositional sequences that contain isolated sandstone and siltstone beds. Bentonite beds also are present in the lower part of the Lewis Shale. The Hanna Formation is a non-marine sedimentary stratum that was deposited as outwash during the Laramide Orogeny and was subsequently folded and eroded in places, forming a hogback ridge. Its composition varies from shale to sandstone and conglomerate, but within the project area it is dominated by quartzite conglomerate. As with the Hanna Formation, the Medicine Bow Formation occurs at ground surface and is composed of coal, carbonaceous shale, and sandstone alluvial plan deposits.

Confidential Exhibit CAT3-8 presents preliminary geotechnical reports for the McFadden Ridge I and High Plains wind generation facilities that are provided as proxy foundation information for the McFadden Ridge II facility.

The primary aquifer systems used in the project area are described as quaternary (alluvial deposits) and late cretaceous aquifer systems in the northern area and early tertiary aquifer systems in the southern area. The direction of groundwater movement in the alluvium of the stream valleys is generally downstream and toward the stream, and most streams in the area derive some of their flow from groundwater. The primary source of recharge is from infiltration of snowmelt and runoff water. The majority of groundwater use in the area is for agricultural and domestic purposes. Groundwater wells within the area vary in depth from 40 to 225 feet below ground surface ("bgs") with static water levels ranging from 12 to 118 feet bgs.

PacifiCorp will continue to assess the impacts of any operating mineral deposits approximately within a one mile radius of the facility. This project is not expected to affect operating mineral deposits or oil and gas leases.

A topographical map showing the terrain of the surrounding area within a five-mile radius of the facility is provided as Confidential Exhibit CAT3-9.

(L) A description of and plans for protecting the surrounding scenic, historical, archeological and recreational locations; natural resources; plant and animal life; and land reclamation, including: (I) A general description of the devices to be installed at the major utility facility to protect air, water, chemical, biological and thermal qualities; (II) The designed and tested effectiveness of such devices; and (III) The operational conditions for which the devices were designed and tested:

Confidential Exhibit CAT3-10 provides information on area scenic byways, recreational locations, national parks, and state parks. The Edness Kimball Wilkins, Glendo, Seminoe, and Pathfinder State Parks are located in the region, along with Ayers Natural Bridge and Pathfinder National Wildlife Refuge recreation facilities. To the east of the project site, located along Wyoming Highway 487, is the historic Sand Creek Massacre Trail. The trail was dedicated on August 16, 2006. The trail exists in Wyoming as a memorial to the Arapaho and Cheyenne who lost their lives at the Sand Creek Massacre in Colorado in 1864. Impacts to visual resource concerns should be minimal because of the rural setting of the project. The WTGs are not anticipated to significantly degrade the surrounding scenic quality of the area.

PacifiCorp has preliminarily sited project components to mitigate potential environmental and natural resource impacts in the project area. This effort will continue as project details emerge.

Highly Confidential Exhibit CAT3-11 provides information on known cultural and paleontological resources at the project site. The preliminary project layout has been arranged to avoid impacts to cultural resources. Additionally, no project related features will be developed in close proximity to known cultural resources. It is anticipated that no National Register of Historic Places eligible archeological sites will be affected by the project. As part of PacifiCorp's plan for protecting the environment, sensitivity practices would be adhered to and any cultural resources would be afforded appropriate protection if discovered during design and construction.

A wetland delineation report is presented in Confidential Exhibit CAT3-12. Based on the preliminary site layout, it is anticipated that all potential impacts on jurisdictional waters of the U.S. and wetlands are currently associated with the construction of access roads. Therefore the project will likely qualify for use of U.S. Army Corps of Engineers Nationwide Permit 12 for utility line construction activities, including access roads. Any impact to wetlands and the waters of the U.S. will be minimized using best management practices, including installation of culverts. Cumulative impacts are not expected to be significant.

The project area lies within the Wyoming Basin ecoregion. The Wyoming Basin ecoregion is found in portions of Colorado, Idaho, Montana, Utah, and Wyoming. This ecoregion is a broad intermontane basin dominated by arid grasslands and shrublands supporting bunchgrasses and sagebrush, interrupted by high hills and low mountains. Most of the uplands in the project area are mapped as mixed-grass vegetative community cover-type (a mixture of graminoids, forbs, and shrubs, with less than 25 percent of the canopy cover contributed by shrubs). Additional vegetative community cover types include Wyoming big sagebrush, irrigated cropland, dry-land crop, greasewood, and basin rock soil. Riparian areas are a mosaic of riparian shrubland on Dutton Creek and small inclusion of riparian forest along Rock Creek. A small area of saltbush community

occurs along the southern boundary. No known threatened or endangered plant species or rare vegetative communities exist within the project area; therefore, the project will not contribute to cumulative degradation of these resources. Any introduction of new noxious weeds by construction truck traffic will be controlled using best management practices.

Wild animals including mule deer, whitetail deer, pronghorn antelope, coyotes, chipmunks, prairie dogs, ground squirrels, and rattlesnakes have been observed. Seasonal range maps indicate that crucial winter range of the pronghorn antelope is contained within the northeastern portion of the existing wind generation area, but not continuing into the McFadden Ridge II expansion area. See Confidential Exhibit CAT3-13 for a presentation of the antelope range map. Birds including red-tailed hawks, golden eagles, bald eagles, nighthawks, sparrows, and various songbirds have been observed. Migrating waterfowl, passerines, shorebirds, raptors, upland game birds, and waterbirds travel through and have been observed in the area during spring and fall migration periods. Based on avian use studies conducted, estimated bird mortality at the site would likely be similar or lower than other wind generation facility located in the western U.S. where observed bird collision mortality has been relatively low.

No federally listed wildlife or bat species were observed within the project area while spring and fall 2007 baseline avian surveys and 2008 raptor nest searches were conducted. However, the survey conducted in 2007 and spring 2008 confirmed the presence of one active bald eagle nest along Rock Creek and northwest of the project area.

Surveys for greater sage-grouse were conducted concurrently with avian baseline surveys in 2007 and 2008. The proposed project area and a one mile buffer distance were surveyed by foot and vehicle. There are no documented greater sage-grouse leks within one mile of the project area boundary, and no leks were found during the 2007 and 2008 avian surveys of the project area.

Greater sage-grouse use of the project area appears to be very low, with only two groups totaling 13 individuals being observed. The project area has been historically grazed, and there is a lack of mature sagebrush, and therefore, suitable cover for greater sage-grouse through most of the project area. Due to the low occurrence date and low flight path, greater sage-group mortality due to collisions with WTG is not likely to occur. The incremental amount of habitat lost in the project area should result in minimal impacts to the greater sage-grouse.

A project area avian constraints map is presented as Confidential Exhibit CAT3-14; and the avian baseline use report is presented as Confidential Exhibit CAT3-15.

PacifiCorp is continuing to collect bat data within the project area.

At the end of project life, PacifiCorp will have reserved funds in its asset retirement obligation ("ARO") account and will use ARO funding to restore the site to near natural conditions.

Lands disturbed during construction would be reclaimed to current conditions to the extent practicable. Ground disturbance would be minimized and best management practices employed by the construction contractors to minimize environmental impacts. PacifiCorp would also employ an environmental inspector(s) to ensure that environmental considerations, and any unforeseen environmental incidents, are appropriately addressed. This individual would ensure prompt and appropriate response to any identified non-compliance situations and ensure environmental protections are appropriately implemented. Periodic environmental audits of the site will also be conducted by PacifiCorp affiliated personnel that are independent of the project team.

During construction, each on-site contractor will be expected to develop, publish, and orchestrate a site-and project-specific environmental protection plan.

Site-specific wildlife management plans will be developed and implemented.

(M) A description of any potential safety hazards:

Prevention of safety hazards and impacts from failure of the project's components will be achieved by a combination of planning and controlled site access. By following industry guidelines and WTG certification processes, the most safe and reliable facility will be constructed. WTGs are equipped with multiple safety systems as standard equipment. For example, rotor speed is controlled by a redundant pitch control system and a backup disk brake system. Critical components have multiple temperature sensors and a control system to shut the system down and take it off-line if overheating conditions are detected. Lightning protection is a standard feature on the WTG, and a specially engineered lightning protection and site grounding system will be installed for the project.

Turbine towers, tower foundations, and above-ground transmission line support structures will be designed according to applicable building codes and nationally accepted design standards to avoid failure or collapse. The selected WTG and tower combination will be subjected to engineering review to ensure that the design and construction specifications are appropriate for the project. This review will include consideration of code/nationally accepted design standard requirements under various anticipated worst case loading conditions and provide a high degree of confidence in the structural adequacy of the towers. The WTGs have been preliminarily sited at locations which exceed a reasonable set-back of over one tip-height.

During active construction, PacifiCorp will follow the manufacturers' recommended handling instructions and erection procedures to prevent material damage to towers or blades that could lead to failure. In addition, certification of the WTGs to the requirements of the *International Electrotechnical Commission ("IEC") 61400-1* standard will ensure that the static, dynamic, and defined-life fatigue stresses in the blades will not be exceeded under the combined load

combinations expected at the project site. The standard includes safety factors for normal, abnormal, fatigue, and construction loads. This certification, together with regular periodic inspections, will give a high level of assurance against blade failure during operation.

The WTGs will be sited at locations that exceed a reasonable set-back distance to safeguard against ice throw. Ice throw over long distances has not been documented as a hazard, and no ice throw injury has been reported from existing wind generation projects. Icing is a rare event, and the turbines for this project will be situated in a remote area.

During construction, planned construction safety controls include: (1) a "PacifiCorp Safety Plan," and (2) the EPC contractor's "Site Specific Safety Plan."

The feasibility of the project site from an aviation and airspace point of view continues to be reviewed. The WTGs will be grouped in strings, and some of the WTGs will include aviation warning lights, as required by the Federal Aviation Agency ("FAA"). The number of WTGs with lights and the lighting pattern of the WTG will be determined through collaboration with the FAA.

(N) A description of the real property, fuel and water requirements, including any source of water along which the major utility facility will be constructed or from which it will obtain or return water:

There are no significant fuel, minerals, or process water requirements for this project.

At the time of this filing, it is anticipated that during project construction, water will be obtained from a municipal water source; an existing senior water rights holder and trucked to the site; or a new well with a permit issued by the Wyoming State Engineer's Office to appropriate groundwater. Once available on-site, water will either be put to immediate use or placed in an on-site temporary water storage tank. Once the project is in operation, only minimal daily domestic water use will be required. The primary domestic water requirement will occur at the shared

existing operations / maintenance building, and will be limited to consumption in restrooms, sinks, washing station(s), showers, internal / external hose use, and as dishwater.

A shared existing septic system and drain field for sanitary sewer waste disposal will be provided at the shared existing facilities.

(O) The acquisition status, source and location of real property, rights-of-way, fuel and water requirements:

Property and rights-of-way acquisition status was mentioned previously. There are no fuel acquisition requirements for this project. A groundwater use application will be applied for from the Wyoming State Engineer's Office if a new extraction well is necessary.

(P) The proposed means of transporting fuel and water requirements:

There is no process related requirement to transport material quantities of fuel and water for this project.

(Q) A description of all mineral rights associated with the facility and plans for addressing any split-estate issues:

PacifiCorp will not own any of the subsurface rights at the site. The Company does not believe that any subsurface right holder will be able to unreasonably displace the resource or any portion of the resource.

PacifiCorp has done prudent legal research on its rights as a surface lease holder, as compared to those of subsurface right holders, and is comfortable that the law does not allow subsurface right holders to unilaterally displace the Company's facilities and that any subsurface right holder would be required to enter into good faith negotiations to reasonably accommodate its subsurface extraction objective.

(R) A statement setting forth the need for the facility in meeting present and future demands for service in Utah and other states:

Development of the proposed wind generation facility in compliance with regulatory requirements is the risk-adjusted, least-cost alternative to meet service obligations in Utah and other states as represented in the Company's testimony and exhibits. The Company's prospective generation planning activities are further described in the Company's 2017 IRP in compliance with Commission Rules.

(S) A description of the commodity or service the facility will make available:

The project will generate electricity using wind as the renewable energy source. Fossil fuel consumption and waste residual disposal obligations will be avoided.

(T) A statement of the facilities effect on the applicant's and other systems' stability and reliability:

This project is not expected to adversely affect the quality, stability, and reliability of the PacifiCorp transmission system or that of other entities. A High Plains proxy large-generator interconnection "Facilities Study Report" and McFadden Ridge II status application is provided as Confidential Exhibit CAT3-16 that summarizes the expected impact.

(U) The status of satisfying local, state, tribal or federal governmental agency requirements. The applicant shall immediately fill all agencies' final orders:

A list of the local, state, tribal, and federal governmental agencies having requirements known at the time of this application, which PacifiCorp must meet in connection with the construction and operation of the project is listed, along with their timing and status, in Confidential Exhibit CAT3-17. Any unforeseen permit requirements will be adequately addressed.

By applying to and working with the various agencies for the construction/operation permits and the Commission, pursuant to Commission rules, the major regulatory requirements and critical reviews for the project are being addressed. PacifiCorp's contractors may provide certain permits including permits for construction storm water pollution prevention control, compliance with building regulations through the Carbon County and Albany County Planning and Zoning Commissions, sanitary sewer extensions, and requirements of the Wyoming Department of Transportation. PacifiCorp will monitor and audit the successful completion, maintenance and closeout of all contractor supplied permits.

The following documents included in Exhibit RMP___(CAT-3) are confidential or highly confidential in their entirety:

Highly Confidential Exhibit CAT3-1	McFadden Ridge Proxy WTG Site Layout
Highly Confidential Exhibit CAT3-2	McFadden Ridge I Amended WTG Scope of Study
Confidential Exhibit CAT3-3	Balance of Plant Scope of Work Template
Confidential Exhibit CAT3-4	McFadden Ridge II Proxy Capital Costs Detail
Confidential Exhibit CAT3-5	McFadden Ridge II Proxy Incremental O&M and Ongoing Capital Costs Detail
Confidential Exhibit CAT3-6	McFadden Ridge II Indicative Project Execution Schedule
Highly Confidential Exhibit CAT3-7	McFadden Ridge II Preliminary Project Map
Confidential Exhibit CAT3-8	McFadden Ridge II Geotechnical Report
Confidential Exhibit CAT3-9	McFadden Ridge II Preliminary Topographical Map
Confidential Exhibit CAT3-10	McFadden Ridge II Preliminary Scenic Byways, Recreational Areas, National Parks, and State Parks Review
Highly Confidential Exhibit CAT3-11	Preliminary Cultural and Paleontological Resources Review
Confidential Exhibit CAT3-12	McFadden Preliminary Wetland Delineation Report
Confidential Exhibit CAT3-13	Preliminary Antelope Range Map
Confidential Exhibit CAT3-14	Preliminary Avian Constraints Map
Confidential Exhibit CAT3-15	Preliminary Avian Baseline Use Report
Confidential Exhibit CAT3-16	McFadden Ridge II Interconnection Facilities Study
Confidential Exhibit CAT3-17	McFadden Ridge II Preliminary Local, State, Federal, and Tribal Requirements Review

Note: The confidential and highly confidential exhibits referenced above are provided subject to Utah Public Service Commission Rules R746-1-602 and 603.

The highly confidential exhibits contain commercially sensitive information which is considered business confidential information subject to Utah Code 63G-2-305(2) and 63G-2-305(3) to protect it from a Government Records Access and Management Act (GRAMA) request. The Company requests special handling. Please contact Bob Lively at (801) 220-4052 to make arrangements to review.

REDACTED
Rocky Mountain Power
Docket No. 17-035-40
Witness: Rick A. Vail

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

REDACTED
Direct Testimony of Rick A. Vail

June 2017

Q. Please state your name, business address, and present position with PacifiCorp.

A. My name is Rick A. Vail. My business address is 825 NE Multnomah, Suite 1600, Portland, Oregon 97232. My present position is Vice President of Transmission. I am responsible for transmission system planning, customer generator interconnection requests and transmission service requests, regional transmission initiatives, asset management, capital budgeting for transmission, and administration of the Company's Open Access Transmission Tariff ("OATT"). I am testifying on behalf of Rocky Mountain Power ("Company").

QUALIFICATIONS

Q. Please describe your educational background and professional experience.

A. I have a Bachelor of Science Degree with Honors in Electrical Engineering with a focus in electric power systems from Portland State University. I have been employed at the Company since 2001, and have had a range of management responsibility within the asset management group, including capital planning, maintenance policy, maintenance planning, and investment planning. I served as director of asset management from 2007 to 2012. I became Vice President of Transmission in December 2012.

PURPOSE AND SUMMARY OF TESTIMONY

Q. What is the purpose of your testimony?

A. My testimony supports the Company's Application, which includes a request for an order under Utah Code Ann. § 54-17-302 approving the Company's "significant energy resource decision" to construct or procure four new Wyoming wind resources (collectively, the "Wind Projects") with a total capacity of 860 megawatts ("MW"). The Application also includes a request for an order under Utah Code Ann. § 54-17-

402 approving the Company's "resource decision" to construct a 140-mile, 500 kilovolt ("kV") transmission line and related transmission facilities. Specifically, my testimony describes the purpose for and customer benefits resulting from the construction of the following proposed facilities, which I refer to collectively as the "Transmission Projects":

<u>"Aeolus-to-Bridger/Anticline Line"</u>

- A 140-mile, 500 kilovolt ("kV") transmission line ("Aeolus-to-Anticline line"), which includes construction of the new Aeolus (500/230 kV) and Anticline (500/345 kV) substations;
- A five-mile, 345 kV transmission line that will extend from the proposed Anticline substation to the Jim Bridger substation, along with associated interconnection facilities at the Jim Bridger substation to accommodate the interconnection of the 345 kV line from the proposed Anticline substation;
- A voltage control device at the existing Latham substation;

<u>"230kV Network Upgrades"</u>

- A new 16-mile 230 kV transmission line parallel to an existing 230 kV line from Shirley Basin substation to the proposed Aeolus substation, including modifications to the Shirley Basin substation to accommodate the new line;
- The reconstruction of four miles of an existing 230 kV transmission line between the proposed Aeolus substation and the Freezeout substation, including modifications of the Freezeout substation to accommodate the new line; and
- The reconstruction of 14 miles of an existing 230 kV transmission line between the Freezeout substation and the Standpipe substation, including modifications

to the Freezeout and Standpipe substations to accommodate the transmission lines.

The reconstructed sections are proposed to be in a parallel alignment to the existing 230 kV transmission lines. The 230 kV Network Upgrades are needed to support interconnection of the Wind Projects, which are described in the testimony of Company witness Mr. Chad A. Teply.

My testimony and exhibits provide the information required by Utah Code Ann. § 54-17-302 and Utah Admin. Code 746-440-1(1) related to the Transmission Projects.

Q. Please summarize your testimony.

A. The Transmission Projects support the Company's short- and long-term energy demands and will strengthen the overall reliability of the existing transmission system. While the Aeolus-to-Bridger/Anticline Line has long been recognized as an integral component of the Company's long-term transmission planning, its construction and that of the other components of the Transmission Projects has not been economic until now. Renewal of the federal wind production tax credit ("PTC") has created a time-limited opportunity for the Company to acquire significant cost-effective, zero-fuel-cost wind resources, generating PTCs from the Wind Projects enabling customers to receive substantial benefits as quantified by Mr. Rick T. Link.

To achieve the full customer benefits of the PTCs, however, the Company must develop the Wind Projects with the Transmission Projects and bring them into service by December 31, 2020. The Wind Projects are not economic without the Transmission Projects, which are needed to relieve existing congestion and to interconnect new PTC-eligible wind facilities in high-wind areas of Wyoming. The

Transmission Projects are not economic without incremental cost-effective wind facilities producing zero-fuel-cost energy and PTCs.

Congestion on the current transmission system in eastern Wyoming limits the ability to deliver energy from eastern Wyoming to the Jim Bridger energy hub. The Aeolus-to-Bridger/Anticline Line will relieve this congestion and increase the transmission capacity across Wyoming by 750 MW. The Transmission Projects will allow the Company to interconnect up to approximately 1,270 MW of wind resources, including the 860 MW of Wind Projects that are the subject of this Application, and create substantial benefits for Utah customers and customers throughout the Company's service area. Construction of the Transmission Projects will also enable the Company to more efficiently utilize existing generation resources in Wyoming to serve loads in Utah, Wyoming, Idaho, and the Pacific Northwest. The Transmission Projects also better position the Company to interconnect future resources in southeastern Wyoming and provide greater flexibility in managing existing resources.

In addition to increasing the transmission capacity out of southeastern Wyoming, the Transmission Projects will also provide critical voltage support to the Wyoming transmission network and enhance the overall reliability of the transmission system by adding incremental new transmission capacity westbound between the Company's existing thermal and renewable facilities, the proposed Wind Projects in eastern Wyoming, and other sources of energy in northern Utah. Additional transmission paths will mitigate the impact of outages on the existing system. The Transmission Projects will also enhance the Company's ability to comply with

mandated North American Electric Reliability Corporation ("NERC") and Western Electricity Coordinating Council ("WECC") reliability and performance standards.

The Aeolus-to-Bridger/Anticline Line is also an important component of the Company's Energy Gateway Transmission Expansion Project ("Energy Gateway") and has long been recognized as a key transmission segment in the region's long-term transmission planning. By acting on this time-limited opportunity to develop the Transmission Projects and the associated Wind Projects, the Company can provide substantial customer benefits.

GENERAL DESCRIPTION OF THE TRANSMISSION PROJECTS

Q. Please describe the Aeolus-to-Anticline line.

A. The proposed Aeolus-to-Anticline line is a single-circuit 500 kV line that will begin at the proposed Aeolus substation, which will be located approximately 11 miles northwest of Medicine Bow, Wyoming. From the Aeolus substation, the transmission line will run west across the Medicine Bow River past the Hanna Draw. The line will then continue southwesterly to Walcott Junction and then west across the Platte River and south of Sinclair and Rawlins, where it will then largely follow an existing 230 kV transmission line to the proposed Anticline substation.

From the proposed Anticline substation, the Company will construct a 345 kV transmission line that will extend north for approximately five miles and terminate into an expansion of the existing Jim Bridger generating plant substation.

The Aeolus-to-Anticline line will be located in Wyoming's Sweetwater and Carbon counties and will primarily cross open rangeland. Approximately 49 percent of

the land crossed is federally owned, seven percent state owned, and nearly 44 percent privately owned.

Attached as Exhibit RMP___(RAV-1) is a map showing the proposed route for the Aeolus-to-Anticline line, along with the other facilities included in the Transmission Projects.

Q. What types of towers and conductors will be used to construct the Aeolus-to-Anticline line?

A. The Aeolus-to-Anticline line segment will be constructed using approximately 522 lattice steel towers with heights about 115 to 160 feet. The steel towers will have a "flat" configuration with each phase being parallel to each other in a horizontal arrangement. Attached to my testimony as Exhibit RMP___(RAV-2) is a sample drawing of proposed 500 kV tower designs.

The conductor for the Aeolus-to-Anticline line will be triple bundled 1272 kcmil 45/7 Aluminum Conductor Steel Reinforced ("ACSR") "Bittern" per phase. Each conductor in the phase bundle will have a diameter of 1.345 inches, with three phases, comprised of three conductors each, for a total of nine conductors in the circuit.

The 345 kV Anticline-to-Jim Bridger line segment will use 25 to 30 of either of the following types of structures: (1) tubular steel H-frames; or (2) poles with heights from about 110 to 150 feet. Attached to my testimony as Exhibit RMP___(RAV-3) is a sample drawing of proposed 345 kV tower designs. The conductor for this segment will also be triple bundled 1272 kcmil 45/7 ACSR Bittern per phase. The steel poles will have two arms on one side, with one arm on the other side to carry one phase per arm.

In addition, each of the transmission line segments will also carry two overhead ground wires. One of the wires will be galvanized steel while the other will be Optical Ground Wire ("OPGW") to facilitate communications. Each wire will have a diameter of approximately 0.5 inches.

Q. Please describe the proposed new Aeolus substation.

A. The new Aeolus 500/230 kV substation will be located approximately 11 miles northwest of Medicine Bow, Wyoming, and will be sited on a Company-owned parcel of land (Township 24 North, Range 80 West, Section 35) and occupy approximately 100 acres. The substation will include security fencing and an improved access road from U.S. Highway 30. The substation will be constructed using conventional air insulated bus and equipment and connect to existing Shirley Basin and Freezeout substations via the connection of an existing 230 kV transmission line into the new Aeolus site (discussed in more detail below). Attached to my testimony as Exhibit RMP___(RAV-4) are the preliminary Aeolus substation one-line diagram and general arrangement drawings.

Construction of the Aeolus substation will require the following:

- Construction of a 230 kV yard, including all work to support the installation of 230 kV breaker bays for termination of the existing Freezeout-to-Shirley Basin 230 kV transmission line and to support the low side of the 500/230 kV transformer;
- Installation of a 230 kV shunt reactor;
- Completion of all site development, civil work, bus work, protection and controls, security and communications, and construction of a control building;
- Construction of a 500 kV yard including all work to support the termination of one 500 kV transmission line to Anticline substation, including two 500 kV breaker bays to support termination of the 500 kV line and connection to the high side of a 500/230 kV transformer;

- Installation of three single phase 500/230 kV transformer units with one additional spare unit;

- Installation of one 500 kV shunt capacitor, three single phase line reactors and one 500 kV neutral reactor;

- Construction of a replacement access bridge over the Medicine Bow River and associated upgrades to an existing unpaved county road from U.S. Highway 30 to the substation location. The bridge will be constructed to Wyoming Department of Transportation HS-20 ("Highway Semi-trailer") specifications. Upon completion, the bridge will become the property and responsibility of Carbon County;

- Completion of all site development, civil work, bus work, protection and controls, security, communications, and construction of a control building including site emergency power; and

- Implementation of a new generation tripping remedial action scheme, which would trip generation in the Foote Creek/Aeolus area in the event the Aeolus-to-Jim Bridger lines (or transformers) trip during high transfers on the Aeolus West transmission path. Initial technical studies indicate tripping up to approximately 660 MW of generation at the following wind farms during high-transfer conditions:

    - Foote Creek: 108 MW

    - Carbon County 1 (Q706): 250 MW

    - High Plains/McFadden Ridge 1: 245 MW

    - Seven Mile I and II: 53 MW.

- Specific remedial action scheme arming levels for lower flow conditions will need to be determined via follow-on technical studies.

In addition, the Aeolus substation will be designed to facilitate future expansion of the site for additional resources.

Q. Please describe the proposed new Anticline substation.

A. The new Anticline 500/345 kV substation will be located approximately three miles northeast of Point of Rocks, Wyoming and will be sited on a Company-owned parcel of land (T20N, R100W, Sec. 13) and occupy approximately 140 acres. The new substation will include security fencing and an improved access road and will be

constructed using conventional air insulated bus and equipment. The Anticline substation will connect to the existing Jim Bridger generating plant substation via a new 345 kV transmission line (discussed above) and can be expanded to accommodate future 500 kV transmission lines. Attached to my testimony as Exhibit RMP___(RAV-5) are the preliminary Anticline substation one-line diagram and general arrangement drawings.

Construction of the Anticline substation will require the following:

- Construction of the new 500 kV substation yard including all work to support the termination of one 500 kV transmission line to the Aeolus substation;
- Construction of two 500 kV breaker bays to support termination of the 500 kV line and connection to the high side of a 500/345 kV transformer;
- Installation of three single phase 500/345 kV transformer units with one additional spare unit;
- Installation of one 500 kV shunt capacitor, three single phase line reactors and one 500 kV neutral reactor;
- Construction of a 345 kV yard which includes a ring bus and 345 kV breakers to facilitate 345 kV line termination to Jim Bridger and future installation of phase shifting transformers; and
- Completion of all site development, civil work, bus work, protection and controls, security and communications, and construction of a control building including site emergency power.

Q. Please describe the modifications to the Jim Bridger generating plant substation that will be necessary to interconnect the new Anticline substation to the Jim Bridger generating plant substation.

A. The new Anticline substation will interconnect to the Jim Bridger substation via a new, five-mile, 345 kV transmission line (discussed above). The Jim Bridger substation is located west of, and immediately adjacent to, the Jim Bridger power plant. To

accommodate the interconnection of the Anticline substation, the Jim Bridger substation will be expanded to include an additional transmission line termination bay. Attached to my testimony as Confidential Exhibit RMP___(RAV-6) are the preliminary Jim Bridger substation one-line diagram and general arrangement drawings related to the construction at the Jim Bridger substation, which will include the following:

- Expanding the existing 345 kV substation yard to add one new 345 kV line termination bay to the existing yard;
- Relocating the existing shunt capacitor to facilitate connection of a new line termination bay to the existing 345 kV bus;
- Completion of all site development, civil work, bus work, protection and controls, security and communications;
- Modification to the Jim Bridger remedial action scheme will be needed due to the re-dispatch of Jim Bridger generation necessary to accommodate new wind generation in eastern Wyoming, while maintaining the 2,400 MW rating on the Bridger West transmission path; and
- Modification of existing protection and control systems within the existing 345 kV yard to enable safe operation of the expanded facility.

In addition, the existing Latham substation, located approximately four miles south of Interstate Exit 187, adjacent to Wyoming Highway 789, will be expanded to include a voltage control device. The type and design of the device will be defined pending completion of future technical studies. The Company plans to install the device within the constraints of the currently leased property boundaries. Attached to my testimony as Confidential Exhibit RMP___(RAV-7) are the existing Latham substation one-line diagram and general arrangement drawings. The substations will be modified once final design details of the voltage control device are determined.

Q. Please describe the 230 kV transmission line from the Shirley Basin substation to the Standpipe substation.

A. The proposed 230 kV transmission line projects will begin at the Company's existing Shirley Basin substation, located approximately 1.5 miles east of the south junction of state highways 77 and 487. A new 230 kV line will parallel an existing 230 kV transmission line running southwesterly along the western side of the Freezeout Mountains and will connect into the Aeolus substation. South of Aeolus substation to Standpipe substation, via the Freezeout substation, the 230 kV project is a reconstruction of the existing 230 kV line. The line continues south out of the Aeolus substation across the Medicine Bow River and connects into the Company's existing Freezeout substation located between the Pine and South Pine Draws. The 230 kV line then continues in a southwesterly direction to the Company's existing Standpipe substation, which is located approximately two-and-one-half miles southeast of Hanna, Wyoming.

All of the 230 kV segments are located in Carbon County and the new line will cross areas of mountainous terrain reaching elevations of approximately 7,500 feet. Attached to my testimony as Confidential Exhibit RMP___(RAV-8) are the existing Shirley Basin, Freezeout and Standpipe substations one-line diagrams and general arrangement drawings. These substations may be modified to accommodate the 230 kV transmission line project. Final drawings will be provided when they become available.

Q. What types of towers and conductors will be used for the 230 kV transmission line?

A. The single circuit 230 kV transmission line will be rebuilt using either wood or steel

H-frame structures with heights ranging from 90 to 120 feet. Attached to my testimony as Exhibit RMP___(RAV-9) is a sample drawing of proposed 230 kV tower designs. The conductor for the section north of the Aeolus substation to the Shirley Basin substation will be double bundle 1575 kcmil ACSR/TW "Potomac" per phase. The conductor for the section south of the Aeolus substation will be a double bundle 1272 kcmil 45/7 ACSR "Bittern" per phase.

Q. Please describe the estimated total cost of the Transmission Projects.

A. The Aeolus-to-Bridger/Anticline Line is estimated to cost [redacted], as summarized in Confidential Table 1 below:

Confidential Table 1

[redacted]	[redacted]

The entire cost of the Aeolus-to-Bridger/Anticline Line will be paid by the Company without contribution from any third-party customer projects.

The 230 kV Network Upgrades are estimated to cost [redacted] as summarized in Confidential Table 2 below:

Confidential Table 2

[redacted]	[redacted]

The Company expects that the costs of the 230 kV Network Upgrades will be re-assessed and assigned to the wind resource facilities selected via the Company's 2017R request for proposals ("2017R RFP") process under their respective interconnection agreements. The 230 kV Network Upgrades and are necessary to support the interconnection of up to 1,270 MW of new or repowered wind generation in eastern Wyoming.

Q. When does the Company expect to complete the construction of the Transmission Projects?

A. The Transmission Projects are being developed together with the Wind Projects, which will generate zero-fuel-cost energy and PTCs that make the codependent projects economic. To obtain the full benefits of the PTCs, the Transmission Projects and the Wind Projects must be in service no later than December 31, 2020.

Q. Why must the Company receive an approval now for a project that is not scheduled for completion until December 2020?

A. The Company does not currently have all of the necessary rights-of-way to construct the Transmission Projects. To achieve an in-service date before the end of 2020, the Company must complete acquiring the necessary rights-of-way by March 31, 2019. The Company must obtain Commission approvals under the schedule it has proposed

in the Application to meet this schedule. A delay in approval jeopardizes the December 31, 2020 deadline and risks the loss of PTC benefits—which will mean that neither the Transmission Projects nor the Wind Projects will move forward. A project critical-path schedule is attached to my testimony as Exhibit RMP___(RAV-10).

BENEFITS OF THE TRANSMISSION PROJECTS

Q. How will the Transmission Projects benefit customers and improve system performance?

A. The Transmission Projects will: (1) relieve congestion and increase transmission capacity across Wyoming, allowing interconnection of new generation resources and greater flexibility in managing existing resources; (2) provide critical voltage support to the transmission system; (3) improve system reliability; and (4) reduce energy and capacity losses. Because the cost of the Transmission Projects are substantially offset by the generation of zero-fuel-cost energy and PTCs from the Wind Projects, customers receive substantial benefits as quantified by Mr. Link.

Q. How will the Transmission Projects increase transmission capacity in southeastern Wyoming?

A. Currently, the Company's transmission system in southeastern Wyoming is operating at capacity, which limits transfer of existing resources from eastern Wyoming. Also, due to limited fault current in the southeastern portion of the transmission system, which indicates a weak grid, interconnection of additional resources in this prime wind region is precluded to maintain grid stability. The Transmission Projects will not only increase the transfer capability from east to west by 750 MW, but will also improve the

fault current providing "stiffness" to the grid. This will allow additional wind facilities in and around the proposed Aeolus substation, which is not possible today.

When the Transmission Projects are complete, the Company estimates that it can interconnect up to approximately 1,270 MW of additional wind facilities east of the Bridger/Anticline substation. The assumed level of new wind resources is higher than the assumed incremental transfer capability of the transmission facilities because wind resources do not generate at their full capability in all hours of the year. At times when wind resources in southeastern Wyoming are operating near full output, other resources in the area can be re-dispatched to accommodate PTC-producing wind generation. Installing more variable resources in an area relative to total transmission capacity allows for more efficient use of the transmission system and the ability to use the most cost-effective resources to meet customer demand.

The increased capacity also provides improved access to existing generation resources, and increased opportunities to move incremental energy from Wyoming to offset higher-priced generation in the PacifiCorp system or other energy imbalance market participants' systems as noted by Mr. Link.

Q. Is the increased capacity from the Transmission Projects consistent with the Company's obligation to provide transmission service under its OATT?

A. Yes. The Company's OATT, approved by the Federal Energy Regulatory Commission ("FERC"), details the Company's requirements and obligations to provide transmission service. Section 28.2 defines the Company's responsibilities, which include the requirement to "plan, construct, operate and maintain the system in accordance with good utility practice." Section 28.3 states the requirement for the Company to provide

"firm service over the system so that designated resources can be delivered to designated loads." The Company is required to provide adequate and non-discriminatory service to all network customers. Although the Transmission Projects are not specifically mandated by the Company's obligations under its OATT, the Transmission Projects will allow the Company to more efficiently meet current and forecasted customer energy demand by relieving the existing transmission congestion in southeastern Wyoming.

Q. Will the up-front transmission costs of the Transmission Projects be recovered in PacifiCorp's transmission rates?

A. Yes, the Transmission Projects are considered network transmission assets under PacifiCorp's OATT and provide a number of benefits to the transmission grid, as discussed earlier in my testimony. Because the Transmission Projects are integrated into PacifiCorp's transmission network and provide benefits to that network, such as congestion relief, increased transmission capacity and improved system reliability, among others, FERC precedent for ratemaking supports rolling the costs of these assets into PacifiCorp's transmission rates.

Q. How will the costs of the Transmission Projects flow into PacifiCorp's transmission rates, and who will pay these rates?

A. All transmission rates charged to wholesale transmission customers must be approved by FERC. PacifiCorp's transmission rate structure is a FERC-approved formula that has been in place since 2012. A formula rate is a method of calculating a rate, but is not the rate itself; the actual transmission rate that is charged to wholesale transmission customers is produced annually by updating FERC-approved inputs to the formula rate.

Formula rates rely on annual updates using inputs from the detailed, publicly available, and audited FERC Form No. 1, along with other Company data. The annual update process includes transmission capital additions such as the Transmission Projects.

PacifiCorp's merchant function is the largest transmission customer of PacifiCorp's transmission system, but there are third-party transmission customers as well. While all transmission customers pay OATT transmission rates, third-party transmission customers generate revenue credits that offset the cost of PacifiCorp's transmission revenue requirement in retail rates, as discussed in Mr. Link's testimony.

Q. What are the benefits resulting from the critical voltage support that will be provided by the Transmission Projects?

A. Under certain operating conditions, voltage control issues have limited the ability to add additional resources, particularly wind facilities, in southeastern Wyoming. The Transmission Projects will solve the voltage control issues and allow up to 1270 MW of additional wind generation to be interconnected into the transmission system.

Q. How will the Transmission Projects improve system reliability?

A. The transmission grid can be affected in its entirety by what happens on an individual transmission line or path. For example, the transmission system between eastern and central Wyoming is comprised of several individual transmission lines or line segments. Attached to my testimony as Exhibit RMP___(RAV-11) is a diagram of the existing Wyoming transmission system. A single outage on any of the individual lines or line segments due to storm, fire, or other interference can and does cause significant reductions in transmission capacity and can negatively impact the Company's ability to serve customers. Line outages require the Company to significantly curtail

generation resources to stabilize system voltages and require less efficient re-dispatch of system resources to meet network load requirements.

In the event of a line outage, the redundancy provided by the Transmission Projects will allow the Company to continue to meet native load service obligations and continue to meet other contractual obligations to third parties. Strengthening this path and increasing system redundancy with the new Transmission Projects will benefit all customers by reducing the risk of outages and inefficient dispatch resulting from those outages.

In addition, the Transmission Projects will improve the Company's ability to perform required maintenance without significant operational impacts to the system, and will reduce impacts to customers during planned and forced system outages. Transmission line and substation maintenance windows are currently limited because the system is highly utilized. By relieving congestion and providing additional transmission paths, the Transmission Projects will allow greater flexibility for the Company.

Q. Can you provide an example where the Transmission Projects will mitigate the impact of an outage on the 230 kV transmission system?

A. Yes. The following are examples of potential outages that will be mitigated by the Transmission Projects:

- For an outage of the Latham-to-Point of Rocks 230 kV line, the Project eliminates the overload on the Dave Johnston to Amasa 230 kV line;
- For an outage of the Mustang-to-Spence 230 kV line, the Project eliminates the overload on 230 kV lines west of Platte;
- For an outage of the Riverton-to-Wyopo 230 kV line, the Project eliminates overloads on 230 kV lines west of Platte;

- For an outage of the Dave Johnston-to-Amasa 230 kV line, the Project eliminates the overload on the 230 kV lines west of Platte; and

- For an outage of the Platte-to-Standpipe 230 kV line, the Project eliminates the need to trip approximately 130 MW of generation at Foote Creek.

Q. Will the Transmission Projects also enhance the Company's ability to meet the reliability standards applicable to its transmission system?

A. Yes. Although the Company currently meets or exceeds the applicable reliability standards and criteria, the addition of the Transmission Projects will allow the Company to more efficiently meet or exceed those standards and criteria.

Q. Please describe the applicable reliability standards.

A. The Company plans, designs, and operates its transmission system to meet or exceed NERC Standards for Bulk Electric Systems ("BES") and WECC Regional standards and criteria. The NERC standards are set forth in 18 CFR Part 40 (Mandatory Reliability Standards for Bulk-Power Systems). The WECC standards and criteria are deemed necessary for the Western Interconnection to meet or exceed NERC standards. The Company must currently comply with more than 100 approved NERC standards. These standards dictate the minimum levels of transmission system reliability, redundancy, and performance required for transmission facilities.

The most relevant standard here is NERC's Transmission Planning Performance Requirements set forth in NERC TPL-001-4, which establishes transmission system planning performance requirements intended to ensure that the BES will operate reliably over a broad spectrum of system conditions and following a wide range of probable contingencies.

Q. How do NERC's and WECC's standards and criteria influence the need for the Transmission Projects?

A. The mandatory standards, particularly, NERC's TPL-001-4 standard, require the Company to have a forward-looking transmission plan to reliably serve current and anticipated customer demands under all expected operating conditions, including normal system operations (all system elements in service) and during system contingencies (where elements of the transmission system are out of service), both planned or otherwise.

The Company performs annual reliability assessments to determine whether its transmission system complies with minimum mandatory system performance standards, which require that during loss of any single transmission system element ("N-1 single contingencies") that firm service is maintained, no system overloads exist, and there is no loss of customer demand.

The Aeolus-to-Anticline line is sub-segment D.2 of Gateway West, which, as part of Energy Gateway, has been included in the Company's annual TPL-001-4 assessment as part of its short- and long-term plans to dependably meet NERC and WECC reliability requirements. The Transmission Projects' new transmission segments are particularly effective in increasing system reliability under the various multiple contingency categories of the TPL-001-4 standard.

Q. Can you explain the TPL-001-4 standard?

A. Yes. The NERC Standard TPL-001-4 requires the Company to plan for a scenario with outages of multiple transmission elements. The Company must plan how it will adjust the transmission system after the first outage and then respond to the second outage

(this type of scenario is referred to as an N-1-1 condition). The Aeolus-to-Anticline line will significantly help under these types of N-1-1 conditions. For example, without the Aeolus-to-Anticline line, the N-1-1 outage of Riverton to Wyopo 230 kV line followed with an outage of Spence to Mustang 230 kV line would require curtailment of the TOT 4A path by approximately 500 MW. But with the addition of the Aeolus-to-Anticline line, this curtailment would not be required. The study was performed with TOT 4A flows at 1,030 MW in the original case. The addition of the Aeolus-to-Anticline line prevents thermal overload on the 230 kV transmission system west of Platte.

Q. What are the WECC path rating studies?

A. The WECC path rating studies follow a three-phase process established by the Planning Coordination Committee ("PCC") that utilizes peer review study groups, made up of the project sponsor and other interested WECC members, to establish a path rating for a given transmission path or set of transmission paths, which may exhibit simultaneous interactions with each other. Path rating studies utilize a transmission model of the Western Interconnection and will take multiple months to evaluate the performance of the new transmission facilities and to demonstrate that the proposed transmission project will have no negative impacts on previously established transmission path ratings. The path ratings that are established following this process represent the "Maximum Path Transfer Capability" of a transmission path.

Once projects complete the second phase of the path rating studies, they are granted an "Accepted" rating and placed in Phase 3 (construction phase) status. After the Accepted status is granted, other projects currently going through the WECC path

rating process must recognize the project in their studies and cannot negatively impact the path rating for the project.

Q. Has the Aeolus-to-Anticline line been included in WECC path rating studies?

A. Yes. The Aeolus-to-Anticline line has undergone WECC's Three Phase Ratings Process, and has been approved by WECC for Phase 3 Construction Phase status as part of the overall Energy Gateway project. The Aeolus West transmission path and three other Gateway West transmission paths (TOT 4A, Bridger/Anticline West, and Path C) have completed the Three Phase Rating Process and were granted Phase 3 status on January 5, 2011. This WECC approval is necessary because it allows the Company to interconnect the Aeolus-to-Anticline line to the wider transmission system in the area and to reliably operate the project at its approved ratings. This line will strengthen the Company's transmission capacity and flexibility, especially when complemented with other Energy Gateway projects, specifically Anticline-to-Populus, Aeolus-to-Clover and Oquirrh-to-Terminal. The Aeolus-to-Anticline line is regarded as a necessary interconnection point to support the long-term transmission expansion planning established in the WECC Region plans and in the most recent Northern Tier Transmission Group sub-regional plan. The construction of this project, as an integral component of the larger Energy Gateway project, provides options to access additional resources.

Q What are the impacts to the system and the Company if the Transmission Projects are not completed?

A. If the projects are not completed, the existing congestion will remain and the Company's ability to deliver resources to load will remain constrained. Because the

Company currently meets all applicable system reliability and performance criteria, the Transmission Projects are not strictly required to satisfy those standards. Rather, the Transmission Projects have long been identified as an important addition to Wyoming's transmission system, and the zero-fuel-cost energy and PTCs generated by the incremental wind resources provide a time-limited opportunity to build the projects now with only a moderate rate impact.

Q. How will the Transmission Projects reduce energy and capacity losses?

A. Reduced energy and capacity losses on the transmission system have the potential to provide significant cost savings over time. Generally, the addition of a new transmission path in parallel with existing lines, like the Transmission Projects, will reduce the energy and capacity losses by reducing the impedance of the transmission system. Reduced line losses mean more efficient delivery of energy and capacity at reduced costs.

Q. Did the Company consider alternatives to the Transmission Projects?

A. Yes. While long-term alternatives to constructing a new transmission line are limited, the Company did consider other approaches, but none were as cost-effective. As described more fully in the testimony of Mr. Link, the Transmission Projects and Wind Projects were included in the Company's 2017 Integrated Resource Plan, where they were analyzed in comparison to alternatives. The resource portfolios that included the Transmission Projects and Wind Projects were consistently least cost, least risk.

Q. Has the Company considered any other alternatives to the Transmission Projects?

A. The Company also considered the ability to obtain additional transmission capacity by upgrading the existing transmission system or implementing alternative transmission

technologies. Since 2013, the Company has completed several important projects to enhance the transmission system in southeast Wyoming, including the dynamic line rating of the Miners (Standpipe)-Platte 230 kV line (2013), Southern Wyoming Voltage Control Scheme, which coordinated wind generation reactive output to stabilize local area voltages (2015), and construction of the Standpipe substation and (60 MVAr) synchronous condenser for voltage control (2016). These projects allowed the Company to delay the Transmission Projects until 2020, but are not a long-term substitute for the Transmission Projects.

REQUIREMENTS OF UTAH ADMIN. CODE R746-440-1(1)

Q. Please summarize how the Company's Application meets the requirements for a Voluntary Resource Decision.

A. Utah Admin. Code R746-440-1(1) describes what must be included in an application a Voluntary Resource Decision. I have incorporated exhibits to my testimony that provide information for the Transmission Projects pertaining to R746-440-1(1).

Q. Have you provided the description of the Transmission Projects required by Utah Admin. Code R746-440-1(1)(a)?

A. Yes. In addition to the description included in the introductory sections of my testimony, Exhibits RMP___(RAV-2), RMP___(RAV-3), RMP___(RAV-4), RMP___(RAV-5), RMP___(RAV-9) and Confidential Exhibits RMP___(RAV-6), RMP___(RAV-7) and RMP___(RAV-8) provide engineering specifications, drawings, and other pertinent technical information for the Transmission Projects.

Q. Have you provided a map of the Transmission Projects as a part of your project description?

A. Yes. The Transmission Projects will be sited entirely in Wyoming, Carbon and Sweetwater counties and the terrain is primarily open rangeland. The map attached as Exhibit RMP___(RAV-1) describes the proposed route for the transmission lines and the proposed locations for the associated substations. Cadastral surveying (which is a field survey that establishes or re-establishes legal property boundaries) for all transmission lines and associated access roads is in progress, so metes and bounds descriptions are not available at this time. The Company will provide the results of the surveys once they are complete. The attached Confidential Exhibit RMP___(RAV-12) provides the Transmission Projects' sections on federal lands and the Transmission Projects' sections on private and state lands.

Q. Have you also prepared a geological report of the proposed sites of the Transmission Projects?

A. Yes. As part of the federal permitting process for the Energy Gateway project, the Company conducted a two-year geotechnical exploration and geologic hazards assessment. For the Aeolus-to-Anticline Line, the geotechnical exploration program consisted of advancing 44 borings, collection of soil samples for laboratory testing, lab testing and determination of soil properties, and reporting for use in the foundation design. The Company intends to advance an additional 44 borings to further inform the foundation design. During the same period, the Company conducted surficial geology and geologic hazard reconnaissance. Recommendations regarding noted geologic hazards were published in reports for all segments of the Aeolus-to-Anticline Line. The

geological reports are included in Exhibit RMP___(RAV-13). The work is also generally applicable to the balance of the Transmission Projects and will be validated as such.

The geotechnical engineering studies concluded that all tower sites were suitable for drilled pier foundations as planned, as long as the recommended values for soil engineering properties are used in the design and consideration is given to potential excavation difficulties during construction.

A geotechnical study consistent in scope and technical approach to that described above and as contained within Exhibit RMP___(RAV-13) will be performed for the 230 kV Network Upgrades.

Shallow groundwater is not likely to pose a significant constraint on the Transmission Projects, but could complicate foundation drilling and construction. Areas where annual or seasonal groundwater depths are less than 10 feet below the ground surface are considered high-risk. Geologic hazard reconnaissance confirms high ground water in only few isolated locations.

Operating mineral deposits are provided in Exhibit RMP___(RAV-14) and a topographical map showing the substation locations and right-of-way overlay is included in Exhibit RMP___(RAV-15).

Q. Please describe where the Company has addressed the Company's compliance with applicable Commission laws and rules, as required by R746-440-1(1)(b).

A. The Company's Application addresses how this filing complies with applicable Commission laws and rules.

Q. Does your testimony address the purposes and reasons for the resource decision, as required by R746-440-1(1)(c)?

A. Yes, that is the primary purpose of my testimony.

Q. As required by R746-440-1(1)(d), please provide the projected costs of the Transmission Projects.

A. The estimated total cost for the Transmission Projects is [redacted]. The individual cost components of this estimate are set forth in Confidential Tables 1-2 above.

Q. Under R746-440-1(1)(d), (f), (i), (j) and (k), can you provide additional background on the Transmission Projects, including a description of project schedules, milestones, and construction timelines, engineering studies, and the general status of the Company's siting and permitting activities?

A. Yes. Starting with the schedule of the Transmission Projects, to meet the December 2020 deadline, the Company expects to execute contracts for the upgrades to access roads and the bridge to the Aeolus substation site by September 2017 and construction on those components is expected to begin in May 2018 for completion by November 2018.

The Company expects to provide a limited notice-to-proceed for the Aeolus-to-Anticline line and 230 kV Network Upgrades by the end of 2018, so that the Company can acquire the necessary rights-of-way by March 31, 2019. The final notice-to-proceed for the Transmission Projects is expected to be issued by April 1, 2019, so that construction can begin.

The Company expects the Transmission Projects to become commercially operational by October 31, 2020.

A project critical path schedule is attached to my testimony as Exhibit RMP___(RAV-10).

Q. Has the Company entered into a binding contract for design and construction of the Transmission Projects?

A. No. The Company has engaged the services of an owner's engineer to provide engineering and design services for the Transmission Projects scope of work. The final designs will be performed by the engineer, procurement and construction ("EPC") contractor(s) selected via competitive market solicitation.

Q. Are there additional technical studies that are necessary before the Transmission Projects are completed?

A. Yes. While many technical studies have been completed to date, a number of technical studies will need to be performed to assure that the completed projects will meet all national standards for engineering, reliability and system operations, specifically:

- Substation and Line Design Studies;
- Static VAr Compensator Design Studies;
- Jim Bridger – Subsynchronous Resonance ("SSR") Analysis Studies and SSR Mitigation Analysis;
- Dynamic Voltage Control Analysis;
- Remedial Action Scheme (Bridger/Aeolus) Studies;
- FAC-013-2 Assessment of Transfer Capability for the Near-Term Transmission Planning Horizon Studies; and
- System Operating Limit Studies.

These technical studies will be completed in phases as required to support the design during the engineering phase of the Transmission Projects. All studies will be completed by late 2018. Near-term planning and operational studies will be completed in the middle of 2020, in preparation for the Transmission Projects being placed in-service by October 31, 2020.

Q. Please describe how the Company plans to address environmental issue associated with the Transmission Projects.

A. The Company has conducted a thorough assessment of the impacts of the Transmission Projects on the surrounding environment and resources. Much of this assessment occurred as part of the permitting process required by National Environmental Policy Act ("NEPA") because portions of the Transmission Projects will be sited on federal land. For the 230 kV line section between Aeolus and Standpipe substations, the route was analyzed for impacts as an alternative under the Gateway South project. The Company and Bureau of Land Management ("BLM") are currently evaluating any requirements necessary to complete the impacts assessment.

In addition to requirements developed via the NEPA process, the Company will also ensure compliance with the Company Avian Protection Plan and other Company Standards.

Q. Please describe the NEPA process.

A. In December 2008, the Company filed a right-of-way permit application with the BLM and the U.S. Forest Service, which triggered the need for BLM to prepare an Environmental Impact Statement ("EIS") in accordance with the requirements of NEPA. The draft EIS was released for public comment on July 29, 2011, and the Final

EIS was published on April 26, 2013. The Record of Decision was released on November 14, 2013.

The BLM used the following criteria to select the authorized route:

- Allow for reasonable construction costs associated with the preferred route;
- Route on public land where practical;
- Avoid cultural and natural resource areas;
- Avoid sensitive species habitat, including bald eagle nests and big game winter range;
- Follow existing corridors or linear structures;
- Avoid Visual Resource Management Class II areas;
- Avoid designated areas such as National Monuments, Wilderness Study Areas, National Landscape Conservation System areas and State and local parks; and
- Avoid BLM-identified preliminary priority sage-grouse habitat and Wyoming core habitat areas.

The assessment that supported BLM's EIS analyzed the impact of construction, ongoing operation and maintenance, and decommissioning and reclamation of the Aeolus-to-Bridger/Anticline Line. The assessment considered the cumulative effects of the proposed Transmission Projects, together with past, present, and reasonably foreseeable future actions, and addressed the following:

- Cultural resources, such as prehistoric or historic archaeological sites, districts, buildings, historic trails, roads, and landscapes;
- Vegetation communities, including the potential impact of invasive plant species due to the construction process;
- Wetlands and riparian areas;
- Wildlife and fish, including big game, small mammals, reptiles, amphibians, migratory birds and raptors;

- Special status species, including those listed under the federal Endangered Species Act ("ESA"), those proposed for federal listing as well as candidates under the ESA, BLM, or Forest Service Sensitive species, Forest Service Management Indicator Species, and State Heritage Program plant species of concern;
- Soils, include clearing, grubbing, and grading along the rights-of-way and at additional temporary workspaces; trenching; backfilling; excavating; and construction of permanent structures, such as transmission line structures, access and service roads, co-generation sites, and substations;
- Paleontological resources;
- Water resources;
- Agricultural resources;
- Air quality; and
- Noise.

Based on that analysis, the BLM and cooperating agencies concluded that for many resources, the effects of the Transmission Projects, coupled with the effects of other known projects, will not be substantial. To the extent that resources may be impacted, the Company has proposed reasonable mitigation efforts to minimize the impact.

Q. What impact assessment studies have been performed?

A. The studies related to the impact assessment are included in BLM's Record and Decision. The studies are voluminous and can be found at following websites:

- The Final EIS:

https://eplanning.blm.gov/epl-front-office/eplanning/docset_view.do?projectId=65164&currentPageId=92763&documentId=78833

- The Final EIS Appendices:

https://eplanning.blm.gov/epl-front-office/eplanning/docset_view.do?projectId=65164&currentPageId=92763&documentId=78834

The mitigation plans are also included in the above links and identified in the attached Exhibit RMP___(RAV-16).

Q. Please describe the Company's plan of development related to the Transmission Projects.

A. Once the Transmission Projects are in service, they will not directly produce any emissions into the environment. The Company is preparing the plan of development, which will govern the construction phase of the Aeolus-to-Bridger/Anticline Line and must be approved by BLM. This plan will include specific requirements to ensure full compliance with all applicable regulations and requirements of the right-of-way permit granted by BLM for siting the Aeolus-to-Bridger/Anticline Line on federal lands. The plan of development will also include best practices for all aspects of environmental protection. The Company anticipates that, at a minimum, the plan of development for the construction phase will account for fugitive dust control, storm water pollution prevention, spill containment and counter measures, plant/wildlife restrictions, and ground disturbance reclamation. The Company anticipates that the protection measures it will use for the Transmission Projects as shown in Exhibit RMP___(RAV-17) will be similar to those implemented on the Company's Mona-to-Oquirrh and Sigurd-to-Red Butte transmission projects, adjusted to meet the specifics of this project as necessary.

Once the Transmission Projects are in service, the Company will install three primary devices to protect air, water, chemical, biological, and thermal qualities:

- Construction of retention basins at the substation sites to control storm water runoff, to manage erosion control and waterflows across adjacent properties as well as at the substation sites;

- Storm water control along the transmission line access routes will be managed using ditches at the verge of new access roads along with water control and diversion techniques, such as the use of water bars; and

- At the substation sites, an oil containment plan will be incorporated into the final design such that, in the event of a leak, the contents of any oil-filled equipment would be contained within the substation site and not leach into the underlying soils.

Q. Please describe the effectiveness of the three protective devices you describe above and the operational conditions for which the Company designed and tested the devices.

A. The devices all represent proven technology employed at numerous substations and other facilities across the United States. Water-retention designs will comply with all relevant codes as well as the Clean Water Act requirements, where applicable. The Company has successfully employed all of these techniques on recent transmission projects including Populus-to-Terminal, Mona-to-Oquirrh, and Sigurd-to-Red Butte transmission projects.

Q. Please describe any potential safety hazards related to the Transmission Projects.

A. The Company requires a high standard of safety performance and planning by all of its employees and contractors. During the construction phase, the primary safety hazards will vary somewhat by stage of the project, but will generally relate to:

- Heavy equipment operations;
- Open excavations;
- Slips, trips and falls;
- Crane operations;
- Working at height;
- Working around energized facilities; and
- Climatic conditions.

The Company will require all personnel working on the Transmission Projects to perform safety training specific to the Transmission Projects. The safety plan will require appropriate safety markings, barriers and other restriction devices to prevent worker or public access to potentially unsafe conditions.

During operations, the main safety hazard will be the energized facilities. Tower structures are designed to provide electrical clearances to the ground and structures and prevent climbing without specialist equipment, so that the public cannot reach the conductor.

All substation energized facilities are constructed so that the high-voltage equipment is placed with sufficient clearances from the site security fence to prevent accidental contact with the energized equipment. All substations will include security fencing, controlled access devices, security monitoring to limit and manage personnel gaining access to the site.

Q. Please describe the status of satisfying local, state, tribal, or federal governmental agency requirements.

A. The Company has obtained a federal right-of-way permit from the BLM, which covers approximately half of the 140 mile-length of the Aeolus-to-Anticline line. The right-of-way grant was authorized concurrently with the release of the Record of Decision, discussed above. The BLM's decision provides the authorizations, with stipulations, necessary for the Company to begin construction on federally administered lands.

Stipulations in the right-of-way grant require additional environmental surveys to be completed to clear construction areas before receiving the notice to proceed to construct on public land. The Company is currently conducting surveys for cultural,

paleontological, biological and potential wetland resources that will need to be protected and, if adversely impacted, mitigated. The BLM and the U.S. Corp of Engineers will issue final notices to proceed after receipt and approval of survey reports, pre-construction notifications, and payment of any required mitigation funds determined.

In addition, the right-of-way grant includes the requirement to comply with several additional federal agency required permits and approvals, which the Company is currently in the process of completing, including Section 106 Consultation under the National Historic Preservation Act, Section 404 Clean Water Act Permit, and Resource Protection Plans required by the BLM.

The Company is in the process of securing all relevant federal, state, and local permits for the 230 kV section between the Aeolus substation and the Standpipe substation. The Company anticipates that this section will be subject to the same or similar conditions included in the Record of Decision, released November 12, 2013.

Q. What is the current status of the necessary permits from local government entities?

A. The Company has or will receive the required consents, franchises, and permits from all the local governmental entities having jurisdiction over the proposed route for the Transmission Projects. These will include an application to the Wyoming Department of Environmental Quality and the Wyoming Industrial Siting Council for the issuance of a permit. The Company will also obtain a conditional use permit from Carbon County and a construction permit from Sweetwater County.

In addition to the conditional use permit, the Company is in the process of obtaining the required consents and permits from the State of Wyoming, subject to completion of the final design of the transmission line alignment. Additionally, the Company will obtain any permits and approvals required from state agencies for actual construction and operation of the Transmission Projects in the ordinary course of development. These required consents and permits may include, but may not be limited to, stream alteration permits from the Wyoming Game and Fish Department, highway encroachment permits from the Wyoming Department of Transportation, storm water permits from the Wyoming Department of Environmental Quality Water Quality Division, rights-of-way grants from the Wyoming State Trust Lands Administration, and approvals from the State Historic Preservation Office of Wyoming.

Based on the current routing plan, these are the only permits, franchises, and consents required for the Transmission Projects. Should a routing change resulting from the environmental approval process require any additional local consents, franchises, or permits, the Company will immediately seek such approval and provide notice to the Commission.

Exhibit RMP___(RAV-18) provides additional details on the required permits.

Q. Please describe the sage grouse habitat in the vicinity of the Transmission Projects.

A. As part of the NEPA process, the Company's assessment specifically addressed the potential impact of the Aeolus-to-Bridger/Anticline Line on sage grouse habitat. The studies related to sage grouse are included in the Final EIS issued by BLM. In addition, the mitigation plan associated with sage grouse is described in Exhibit RMP___(RAV-16).

The Company is also in the process of developing a Greater Sage Grouse Avoidance, Minimization, and Mitigation Plan to demonstrate compliance with BLM and state policies designed to minimize impacts to sage grouse and their habitat, and support the position that a listing as threatened or endangered under the ESA is not needed.

Q. Under R746-440-1(1)(e)-(f), has the Company supported this Application with economic analysis of the Transmission Projects, including consideration of alternative resources?

A. Yes. This information is provided in my testimony and the testimony of Mr. Link.

Q. R746-440-1(1)(g) requires information on the Transmission Projects' effect on the Company's revenue requirement. Please explain where that information is located in the Company's Application.

A. Mr. Jeffrey K. Larsen and Mr. Link sponsor the Company's revenue requirement analyses related to the Transmission Projects.

Q. R746-440-1(1)(h) requires information on how the Transmission Projects will be financed. Where is that information in the Company's Application?

A. The testimony of Ms. Cindy A. Crane explains how the Company intends to fund the investment in the Transmission Projects.

RECOMMENDATION AND CONCLUSION

Q. Please summarize your recommendation to the Commission.

A. I recommend that the Commission approve the Company's Application. The Transmission Projects will provide substantial benefits to its customers and are prudent and in the public interest. Based on this conclusion, I recommend that the Commission

grant the Company's Application for approval of its "voluntary resource decision" for the Transmission Projects.

Q. Does this conclude your direct testimony?

A. Yes.

Rocky Mountain Power
Exhibit RMP___(RAV-1)
Docket No. 17-035-40
Witness: Rick A. Vail

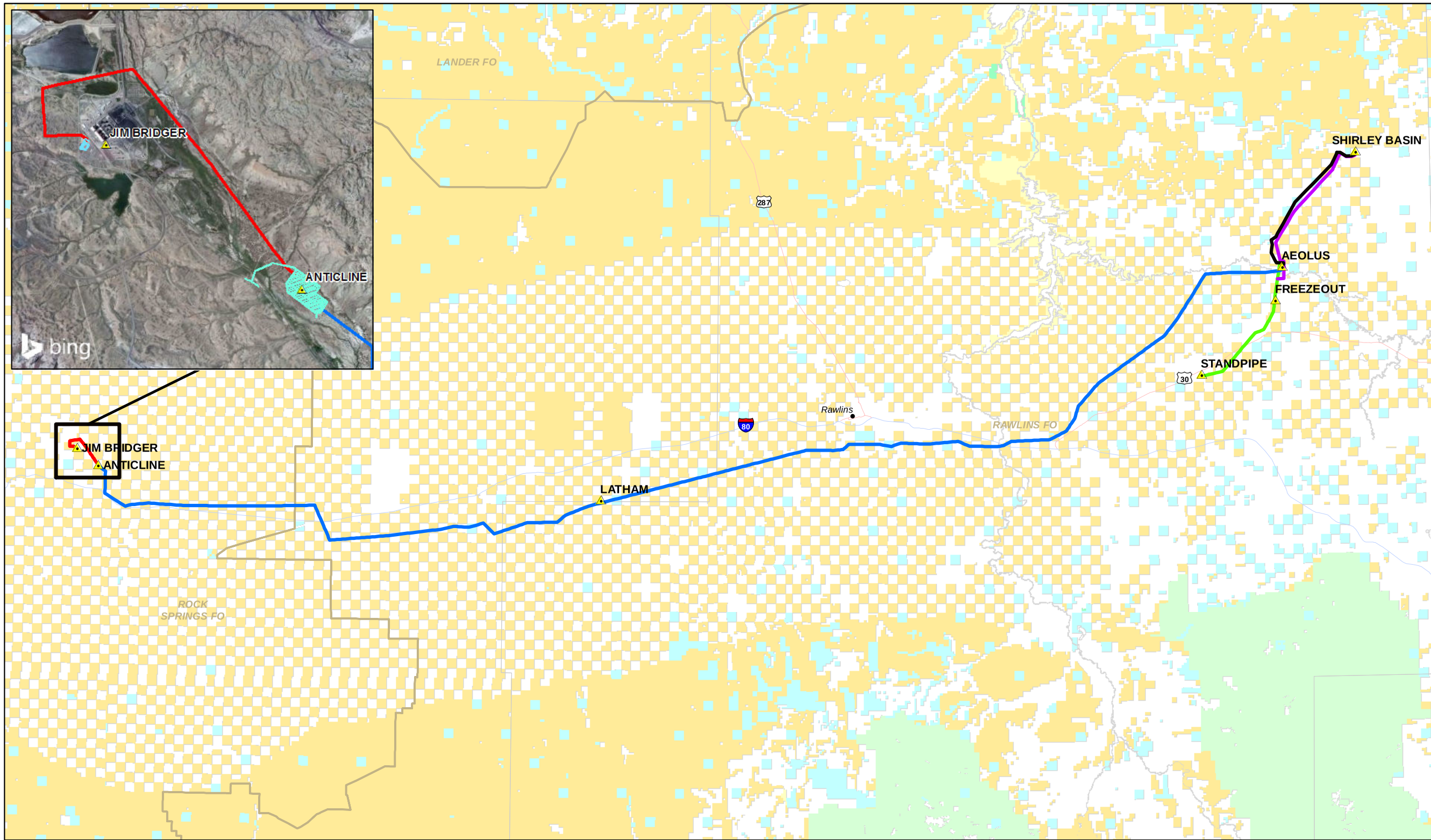
BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

Exhibit Accompanying Direct Testimony of Rick A. Vail

Map of the Transmission Project Route

June 2017



Freezeout - Standpipe 230 kV Rebuild
230 kV NEW
230 kV
500 kV
345 kV

Substation

Administrative Features
City/Town
State
BLM Field Office
County

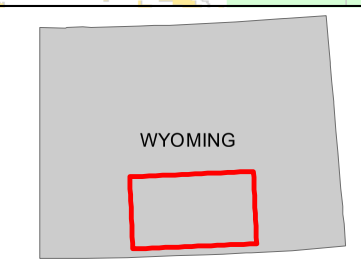
Transportation
Interstate
US Highway

Surface Ownership
Department of Defense
Department of Engergy

Indian Reservation
Forest Service
Bureau of Land Management
Bureau of Reclamation
Fish and Wildlife Service
National Park Service

State
Private

0 5 10 20
Miles



Transmission Project Overview

Date: 6/26/2017

POWER ENGINEERS

NO.	DATE	REVISION	ENGINEER	DES. DR.	CHECKED	APPROVED

PACIFICORP

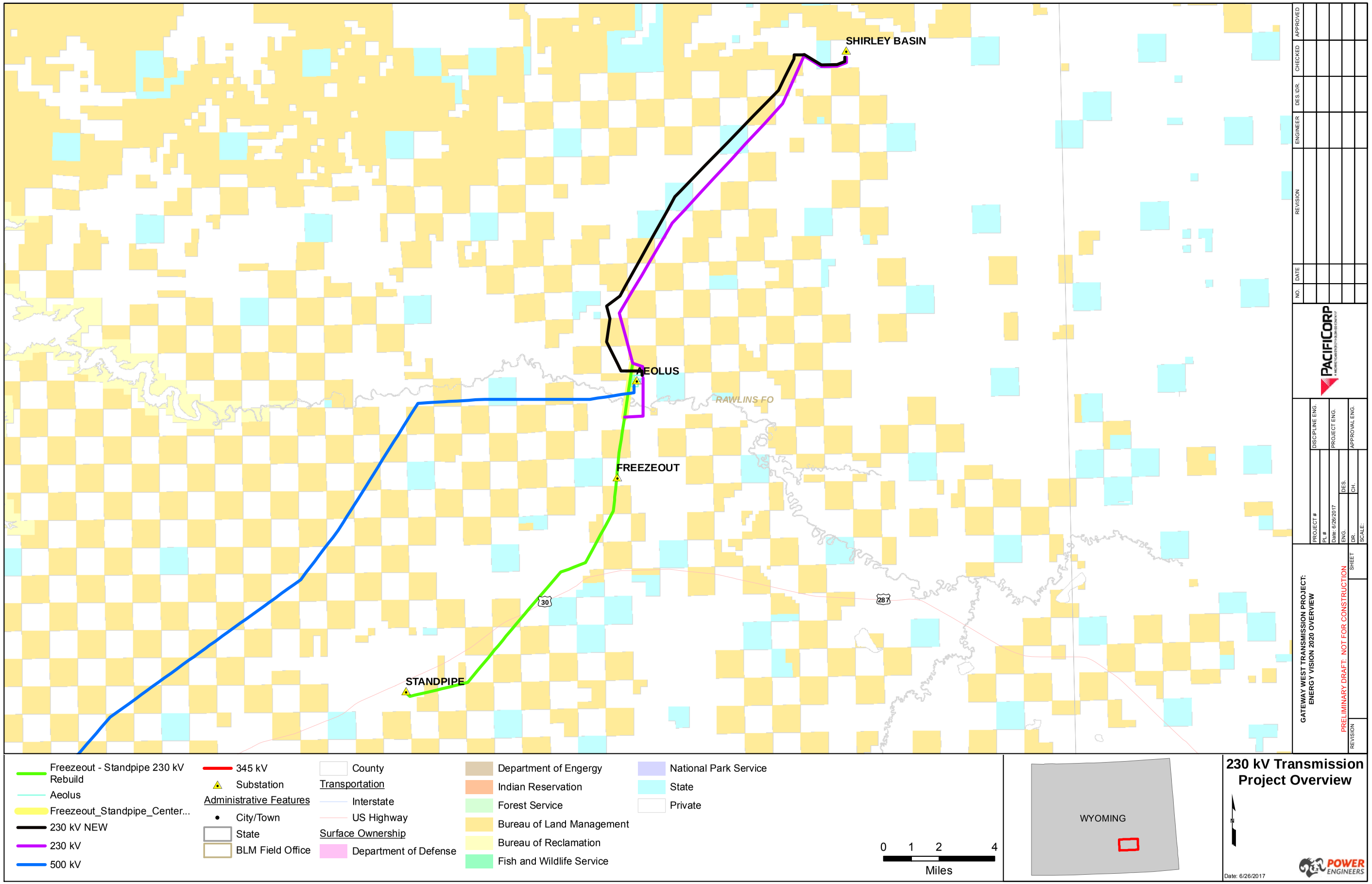
DISCIPLINE ENG.
PROJECT ENG.
APPROVAL ENG.

PROJECT #
PL #
Date: 6/26/2017
ENG.
DR.
SCALE:
DES.
CH.
SHEET
REVISION

GATEWAY WEST TRANSMISSION PROJECT:
ENERGY VISION 2020 OVERVIEW

PRELIMINARY DRAFT: NOT FOR CONSTRUCTION

Rocky Mountain Power
Exhibit RMP___(RAV-1) Page 1 of 2
Docket No. 17-035-40
Witness: Rick A. Vail



Rocky Mountain Power
Exhibit RMP___(RAV-1) Page 2 of 2
Docket No. 17-035-40
Witness: Rick A. Vail

Rocky Mountain Power
Exhibit RMP___(RAV-2)
Docket No. 17-035-40
Witness: Rick A. Vail

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

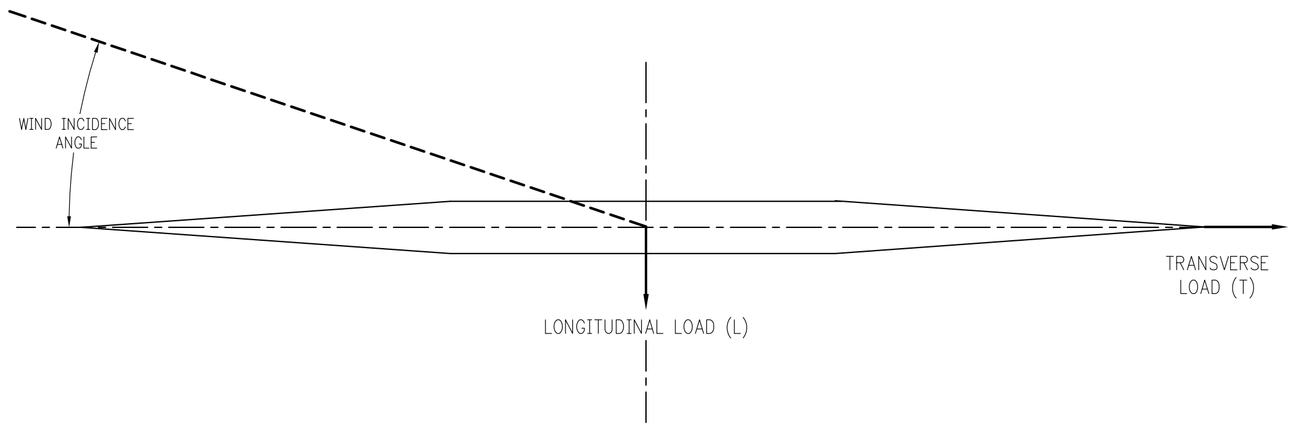
ROCKY MOUNTAIN POWER

Exhibit Accompanying Direct Testimony of Rick A. Vail

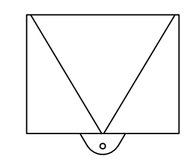
500 kV Tower Design

June 2017

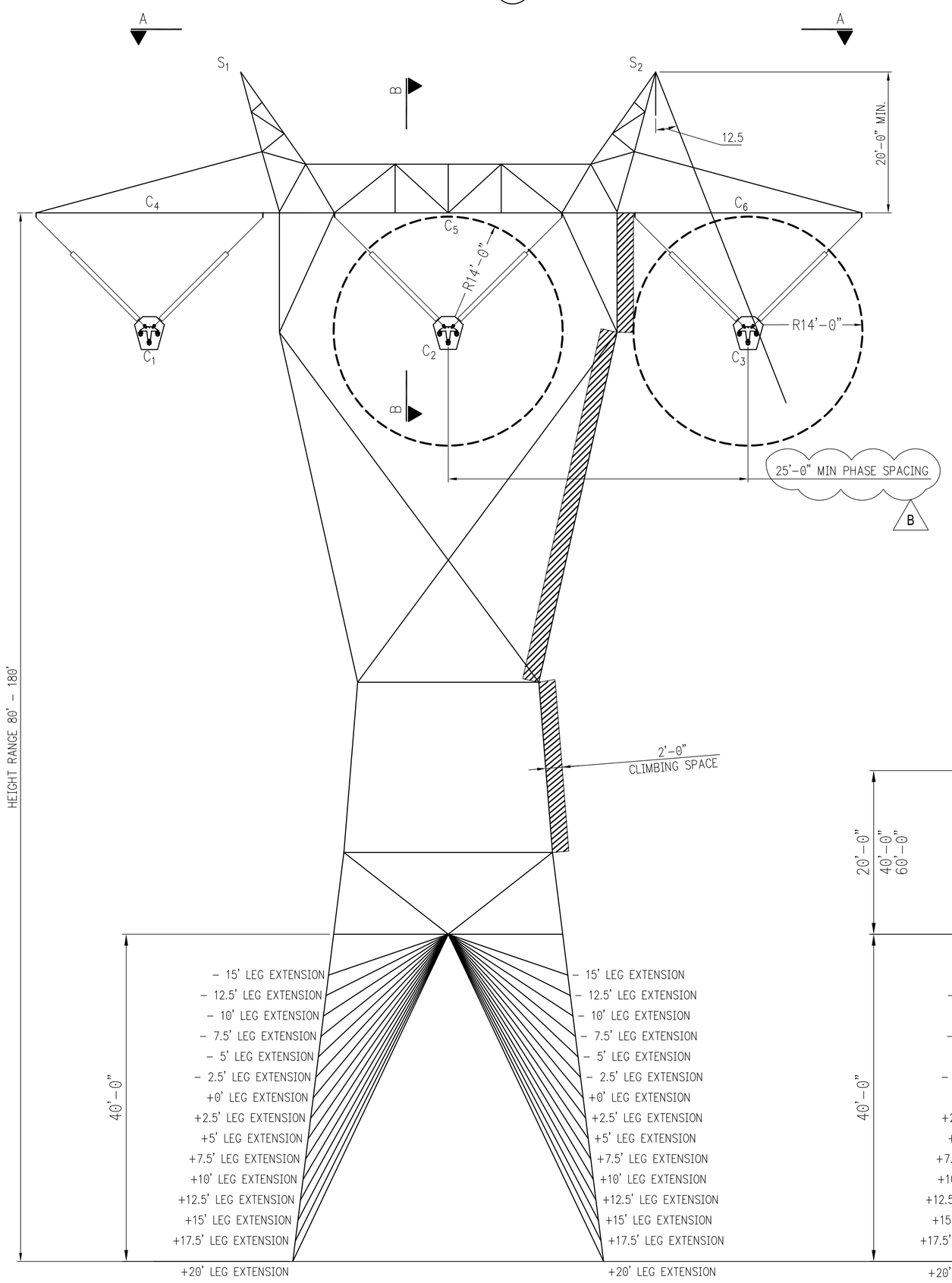
PLOT SCALE: 1:1



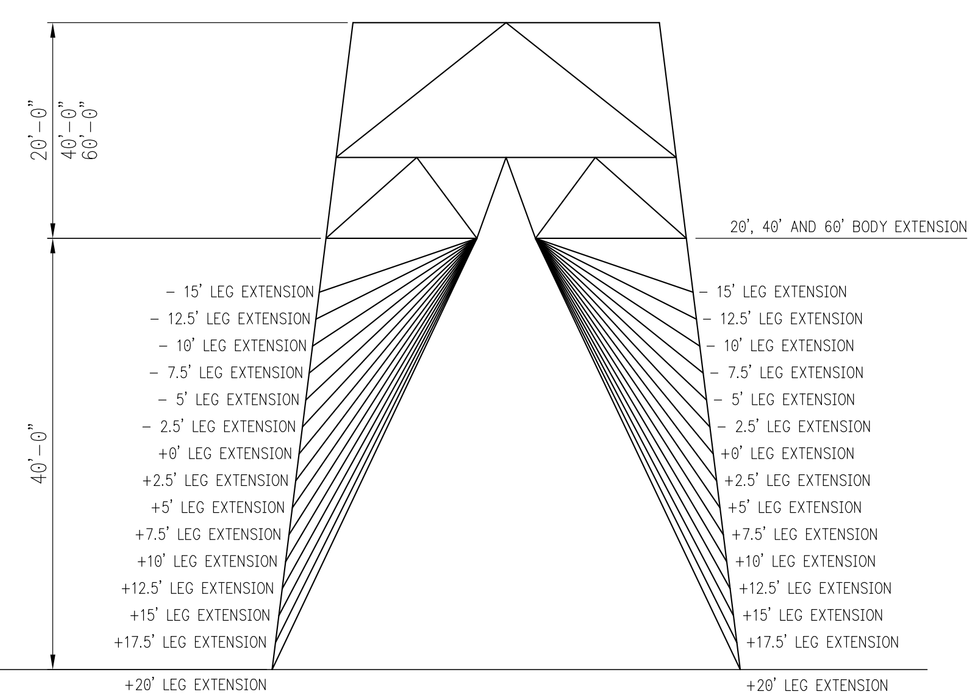
SECTION A
LOAD AND WIND DIRECTION



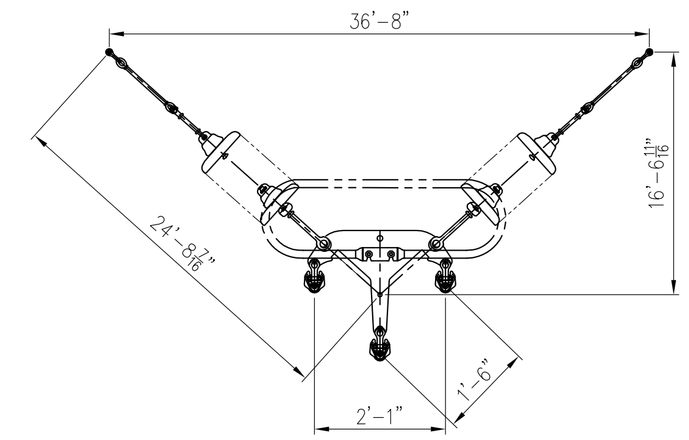
SECTION B
CENTER MAINTANACE POINT



500kV TANGENT TOWER -
"S5T" (0°-1°)



20.0 FT BODY EXTENSION
BELOW BASIC BODY



GENERAL DETAILS OF VEE-STRING CONFIGURATION

TOWER DESCRIPTION:

TYPE S5T (SINGLE CIRCUIT SELF-SUPPORTING, THREE PHASE PER CIRCUIT, THREE SUB-CONDUCTORS PER PHASE; TWO OHGW/OPGW)

MAX ANGLE	1 DEG
MAX WIND SPAN	1600 FT
MAX WEIGHT SPAN, CONDUCTOR	1950 FT
MAX WEIGHT SPAN, OHGW/OPGW	2150 FT
REDUCED WEIGHT SPAN	950 FT
MIN. WEIGHT/WIND SPAN RATIO	0.6

WIRE DATA:

CONDUCTOR:
TRIPLE-BUNDLED 45/7 ACSR, "BITTERN"
DIAMETER 1.345 INCHES; WEIGHT 1.432 LB/FT; R.T.S. 34100 LBS;
12000 LBS MAX. WORKING TENSION UNDER NESC MEDIUM LOADING CONDITION (15°F, 4 PSF WIND, 0.25" ICE, INITIAL)

OPGW:
FUJIKURA/AFL 48-FIBER (SPECIFICATION DNO-6799 OR DNO-6800)
DIAMETER 0.637 INCH; WEIGHT 0.375 LB/FT; R.T.S. 14943 LBS;
5350 LBS MAX. WORKING TENSION UNDER NESC MEDIUM LOADING CONDITION

OHGW:
1/2" EHS 7-STRAND STEEL
DIAMETER 0.495 INCH; WEIGHT 0.517 LB/FT; R.T.S. 26900 LBS;
5900 LBS MAX. WORKING TENSION UNDER NESC MEDIUM LOADING CONDITION

NOTES

1. TOWER SPECIFICATION NOT PROVIDED FOR PRELIMINARY DESIGN. DESIGN SHALL CONFORM TO TYPICAL INDUSTRY STANDARDS AND ASCE 10 (CURRENT EDITION).

2. THE TOWER HEIGHTS LISTED ARE TO THE "TOP OF CONCRETE LEVEL".

3. LOADS INDICATED IN TABLE 1 ON L1A ARE INCLUSIVE OF ALL OVERLOAD FACTORS (OLF).

4. THE VERTICAL LOADS IN PARENTHESIS CORRESPOND TO REDUCED WEIGHT SPANS.

5. WIND PRESSURES IN TABLE 1 ON L1A ARE INCLUSIVE OF ALL OVERLOAD FACTORS. VALUES ARE GIVEN IN POUND PER SQUARE FOOT (PSF). WIND LOADS SHALL BE APPLIED TO THE PROJECTED TRANSVERSE AND LONGITUDINAL FACES OF THE TOWER. WIND PRESSURES SHALL BE MULTIPLIED BY CODE REQUIRED DRAG COEFFICIENTS AND AREA FACTORS TO ACCOUNT FOR LOADING ON FRONT AND BACK FACES. USE A DRAG (OR SHAPE) FACTOR OF 3.2

6. FOR YAWED WIND CASES, THE WIND PRESSURE ON WIRES HAS BEEN REDUCED BY ($\cos^2\Psi$) WHERE Ψ IS THE ANGLE OF INCIDENCE. SEE SECTION A-A.

7. THE LOADS SHALL BE APPLIED AT THE TIP OF THE INSULATOR STRINGS. LOADS FROM INSULATOR WEIGHT AND WIND AREA HAVE BEEN INCLUDED IN THE LOADING TREE VALUES.

8. A CLEARANCE OF 14'-0" SHALL BE MAINTAINED TO ALL OTHER PARTS OF THE TOWER AND CLIMBING/WORKING SPACES.

9. THE OPGW/OHGW SHALL BE POSITIONED TO PROVIDE A MINIMUM SHIELD ANGLE OF 12.5° TO THE OUTERMOST SUB-CONDUCTOR OF THE OUTSIDE PHASE.

10. ALL MEMBERS TO WITHSTAND A VERTICAL LOAD OF 350 LB AT THE MOST UNFAVORABLE POINT WITH NO OTHER LOADS ACTING.

11. THE OUTLINE OF THE MASTS, CROSSARMS, PEAKS AND BRACING SHOWN IN THIS DRAWING ARE INDICATIVE ONLY.

12. ALL ELEMENTS OF THE TOWER ARE TO BE DESIGNED TO 100% CAPACITY (BUCKLING, TENSION, SHEAR, BEARING, ETC.) FOR ALL LOAD CASES.

13. TOWER MAY BE DESIGNED FOR UNEQUAL LEG EXTENSIONS WITH MAXIMUM 10' ELEVATION DIFFERENCE.

14. TOWER GEOMETRY SHOWN ARE THE MINIMUM DIMENSIONS TO BE MAINTAINED. USING DIMENSIONS AND CLEARANCES PROVIDED, DESIGNER SHALL DEVELOP STRUCTURE GEOMETRY WITH MINIMUM POSSIBLE PHASE SPACING.

15. ICE LOAD ON TOWER MEMBERS NEED NOT BE CONSIDERED.

16. TYPICAL LOAD COMBINATIONS FOR LOAD CASES 5 AND 8 ARE SHOWN. ALL POSSIBLE LOAD COMBINATIONS USING THE INTACT AND BROKEN/CONSTRUCTION/MAINTENANCE WIRE CONDITIONS SHALL BE USED WHEN DESIGNING TOWER.

B 17. MAX TOTAL TOWER HEIGHT SHALL NOT EXCEED 200 FT.

NO.	DATE	REVISIONS	ENGINEER	DES./ DR.	CHECKED	APPROVED
A	12/18/14	WO# ISSUED FOR PRELIMINARY DESIGN	K. BRIDWELL	J.QUINTANA	P. MCLENNA	P. CATOPPOLE
B	01/23/15	WO# ISSUED FOR PRELIMINARY DESIGN	K. BRIDWELL	J.QUINTANA	P. MCLENNA	P. HASENKEHRL

PACIFICORP
A MIDAMERICAN ENERGY HOLDINGS COMPANY

TRANSMISSION

PROJ/ER# | PL# | DISCIPLINE ENG.
DATE: 11/24/12 | LINE CODE: | PROJECT ENG.
ENG:K. BRIDWELL [PE] DES:K. BRIDWELL [PE]
DR: J. QUINTANA [PE] CH: P. MCLENNA [PE]
SCALE: NONE | APPROVAL DRG.

ENERGY GATEWAY WEST
500kV SINGLE CIRCUIT LATTICE STEEL TOWER
STRUCTURE LOADING
TOWER TYPE "S5T" (0°-1°)

REVISION B | SHEET 2 of 4
SST-L1

REVISED 11.01.11 D. HURLEY

FILE LOCATION: J:\124186\D0\DWG\02 Struct\tower ACCESSED BY: JANINE QUINTANA 3351 SAVED BY: (JQUINTANA) 1/23/2015 11:43:34 AM

Rocky Mountain Power
Exhibit RMP___(RAV-3)
Docket No. 17-035-40
Witness: Rick A. Vail

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

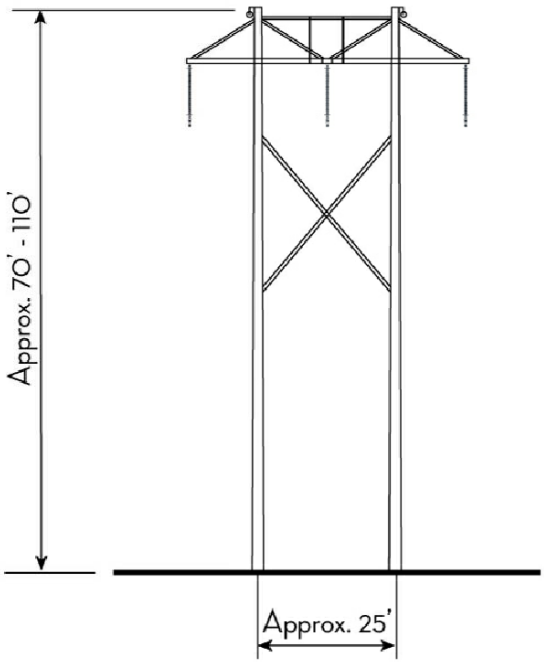
Exhibit Accompanying Direct Testimony of Rick A. Vail

345 kV Tower Design

June 2017

THIS DRAWING WAS PREPARED BY POWER ENGINEERS, INC. FOR A SPECIFIC PROJECT, TAKING INTO CONSIDERATION THE SPECIFIC AND UNIQUE REQUIREMENTS OF THE PROJECT. REUSE OF THIS DRAWING OR ANY INFORMATION CONTAINED IN THIS DRAWING FOR ANY PURPOSE IS PROHIBITED UNLESS WRITTEN PERMISSION FROM BOTH POWER AND POWER'S CLIENT IS GRANTED.

REV	REVISIONS	DATE	DRN	DSGN	CKD	APPD
A	ISSUED FOR REVIEW	06/22/17	JLQ	KB		



DSGN	KB	06/22/17	
DRN	JLQ	06/22/17	
CKD			
SCALE:	NTS		

FOR 8.5x11 DWG ONLY

REFERENCE DRAWINGS

POWER ENGINEERS

PACIFICORP

ENERGY GATEWAY WEST
AEOLUS TO JIM BRIDGER

345kV STRUCTURE

JOB NUMBER 145986

REV A

DRAWING NUMBER S7-2

FIGURE_01.dwg

Rocky Mountain Power
Exhibit RMP___(RAV-4)
Docket No. 17-035-40
Witness: Rick A. Vail

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

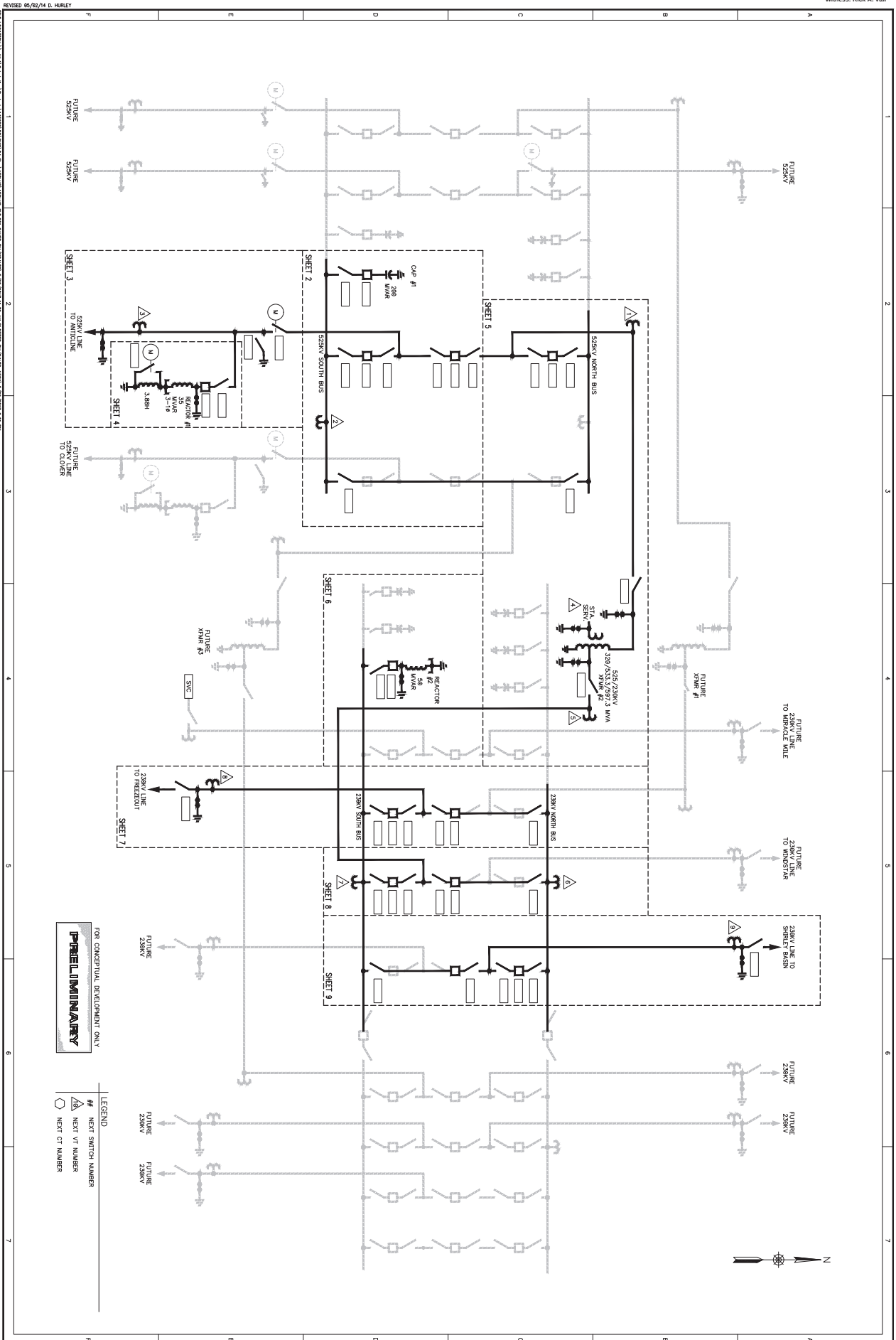
Exhibit Accompanying Direct Testimony of Rick A. Vail

Aeolus One-Line Diagram and General Arrangement Drawing

June 2017

REVISED 05/02/14 D. HURLEY

FILE LOCATION:\\pfnt\Substation\Projects\14586\DT\DWG\04 Elec\AEOLUS\AEOLUS_SLD.001 SAVED BY:NDAVIS) 5/26/2017 11:39 AM PLOTTED BY:DAVIS, NICKI 5/26/2017 2:07 PM



AEOLUS SUBSTATION CARBON COUNTY, WYOMING ONE LINE DIAGRAM KEY SHEET	PROTECTION & CONTROL	PACIFICORP	
REVISION B	AEOLUS SLD.001	SHEET 1 OF 10	

NO.	DATE	REVISIONS	ENGINEER	DES./ DR.	CHECKED	APPROVED
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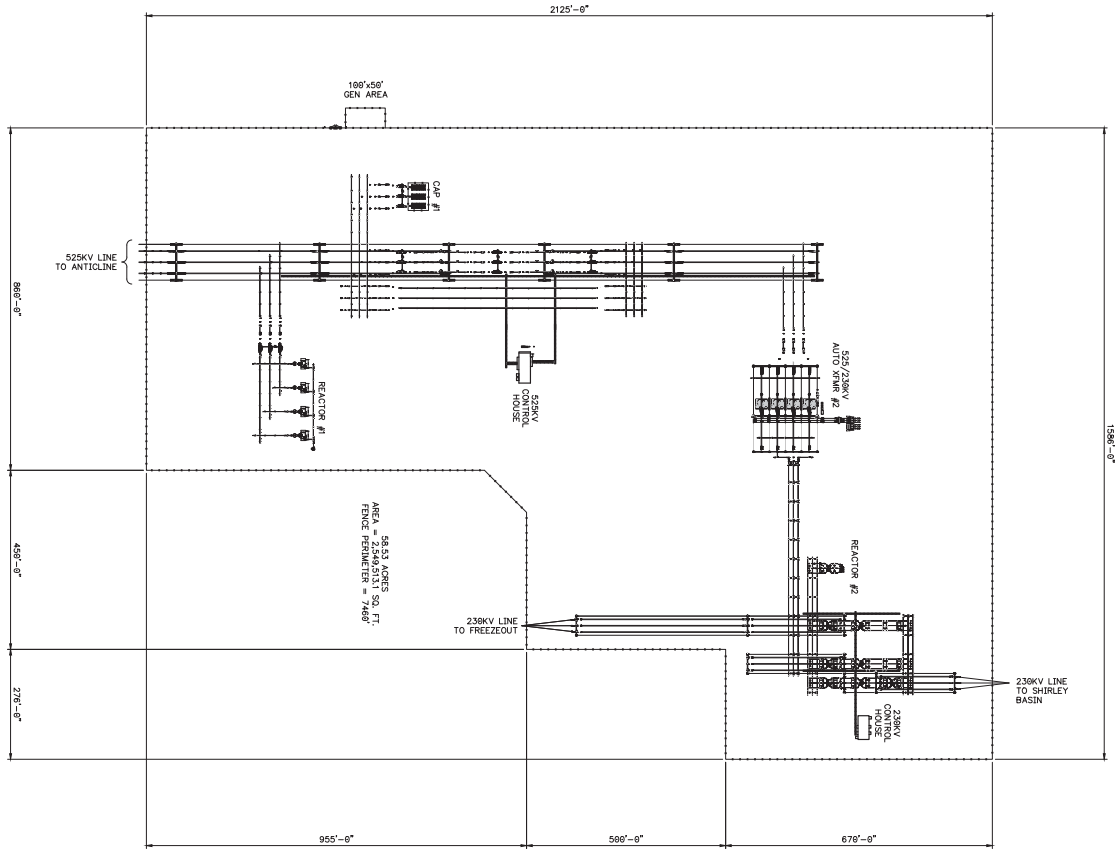
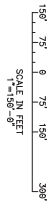
B	05/26/17	WO# REVISED PER COMMENTS	M. COLLINS/PEI	N. DAVIS/PEI		

REVISED 09.18.07 D. HURLEY





PRELIMINARY

FOR CONCEPTUAL DEVELOPMENT ONLY

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ATTACHED XREFS: AEOLUS_SUBBASE_R2.DWG

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	PROJ/ERP#		DISCIPLINE ENG.
	PL#		
	DATE:		PROJECT ENG.
	ENG.	DES.	
	DR.	CH.	APPROVAL ENG.
REVISION B	AEOLUS PLAN	SHEET 2	SCALE: 1"=156'

PACIFICORP

NO.	DATE		REVISIONS	ENGINEER	DES./ DR.	CHECKED	APPROVED
A	04/18/17	WO#	REVISED PER FDD 5.0a	M. COLLINS/PEI	N. DAVIS/PEI		
B	05/26/17	WO#	REVISED PER COMMENTS	M. COLLINS/PEI	N. DAVIS/PEI		

Rocky Mountain Power
Exhibit RMP___(RAV-5)
Docket No. 17-035-40
Witness: Rick A. Vail

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

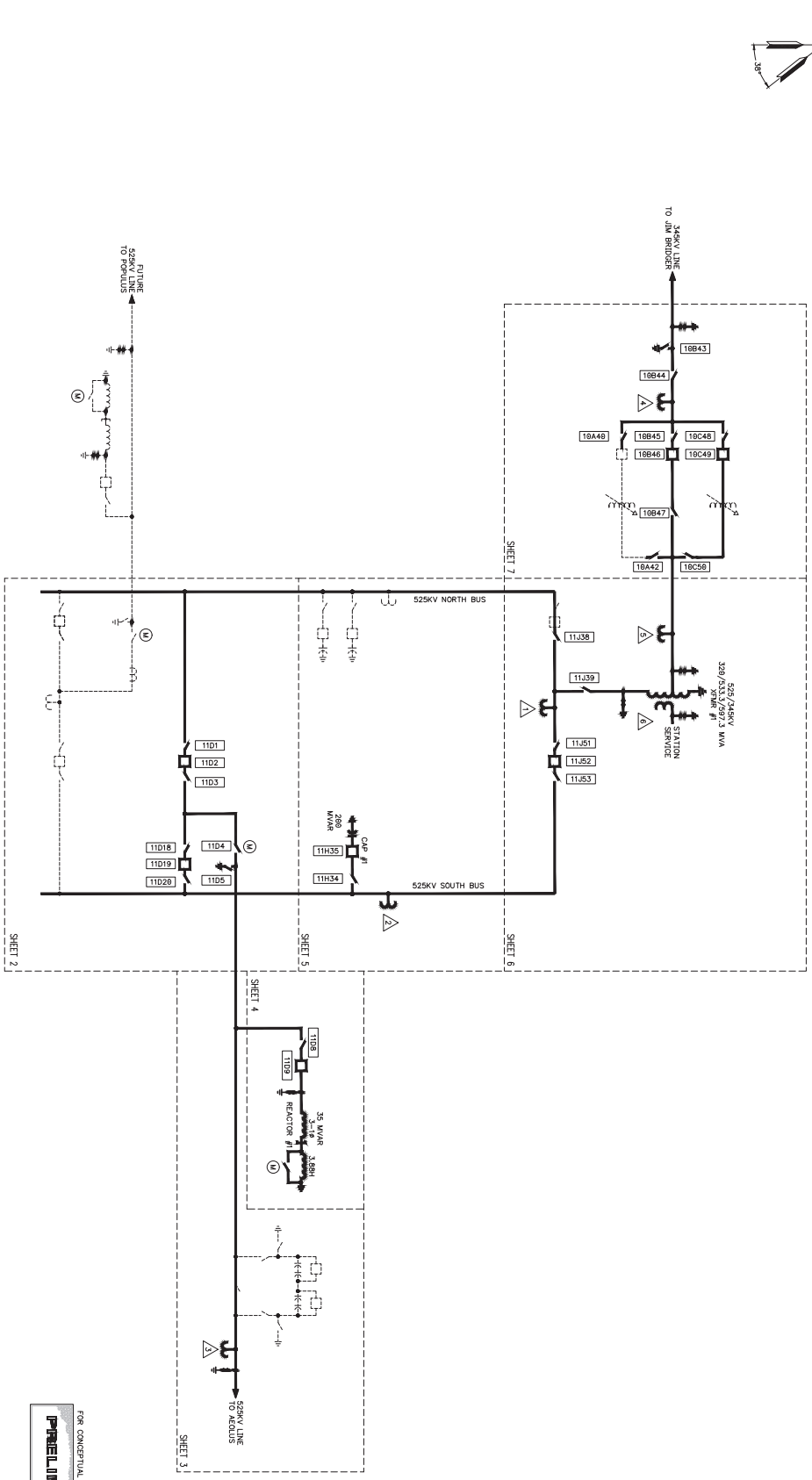
Exhibit Accompanying Direct Testimony of Rick A. Vail

Anticline One-Line Diagram and General Arrangement Drawing

June 2017

REVISED 09.18.07 D. HURLEY

FILE LOCATION:\\PTLFS1\Substation\Projects\45000\20\DWG\04 Elec\ANTICLINE\ANTICLINE.SLD.001 SAVED BY:(NDAVIS) 5/26/2017 1:37 PM PLOTTED BY:(DAVIS, NEDX) 5/26/2017 2:12 PM



LEGEND

NEXT SWITCH NUMBER

NEXT VT NUMBER

NEXT CT NUMBER

NOTES

PRELIMINARY

FOR CONCEPTUAL DEVELOPMENT ONLY

ANTICLINE SUBSTATION SWEETWATER COUNTY, WYOMING ONE LINE DIAGRAM KEY SHEET	PROTECTION & CONTROL		
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	PL#		
	DATE:	PROJECT ENG.	
	ENG. / DES.		
	DR. / CH.	APPROVAL ENG.	
	SCALE: NONE		
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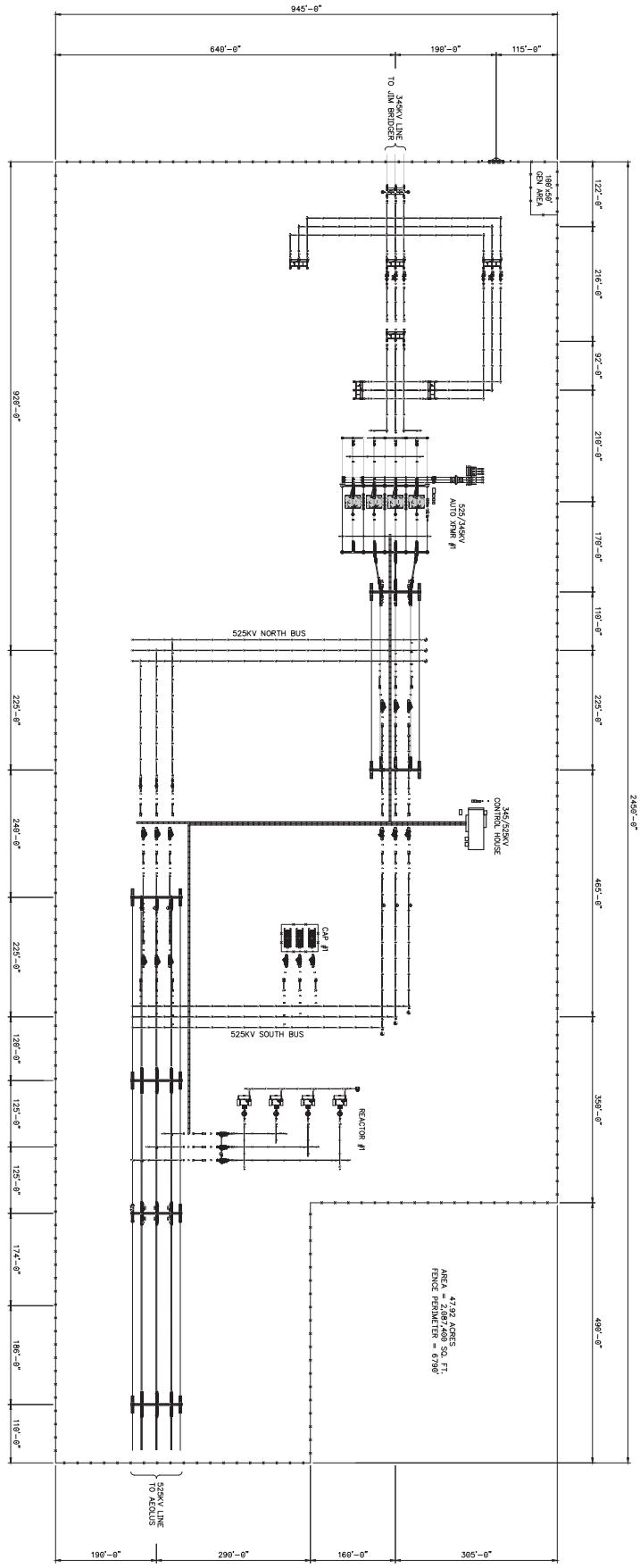
PACIFICORP

NO.	DATE	REVISIONS	ENGINEER	DES./ DR.	CHECKED	APPROVED
A	04/18/17	WO# REVISED FOR FDD 5.0a	M. COLLINS/PEI	N. DAVIS/PEI		
B	05/26/17	WO# REVISED PER COMMENTS	M. COLLINS/PEI	N. DAVIS/PEI		

REVISED 09.18.07 D. HURLEY



PRELIMINARY

FOR CONCEPTUAL DEVELOPMENT ONLY

SCALE IN FEET
1"=100'-0"
100' 50' 0 50' 100' 200'

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ATTACHED XREFS: ANTICLINE-TEMPLATE.DWG

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	PROJ/ERN#	DISCIPLINE ENG.	
	PL#		
	DATE:	PROJECT ENG.	
	ENG. / DES.		
	DR. / CH.	APPROVAL ENG.	
REVISION B / ANTICLINE PLAN	SHEET 2 / SCALE: 1"=100'-0"		

PACIFICORP
A MEMBER OF THE PPW GROUP

NO.	DATE	REVISIONS	ENGINEER	DES./ DR.	CHECKED	APPROVED
A	04/18/17	WO# REVISED FOR FDD 5.0a	M. COLLINS/PEI	N. DAVIS/PEI		
B	05/26/17	WO# REVISED PER COMMENTS	M. COLLINS/PEI	N. DAVIS/PEI		

CONFIDENTIAL
Rocky Mountain Power
Exhibit RMP___(RAV-6)
Docket No. 17-035-40
Witness: Rick A. Vail

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

CONFIDENTIAL
Exhibit Accompanying Direct Testimony of Rick A. Vail

Jim Bridger One-Line Diagram and General Arrangement Drawing

June 2017

THIS EXHIBIT IS CONFIDENTIAL IN ITS ENTIRETY AND IS PROVIDED UNDER SEPARATE COVER

CONFIDENTIAL
Rocky Mountain Power
Exhibit RMP___(RAV-7)
Docket No. 17-035-40
Witness: Rick A. Vail

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

CONFIDENTIAL
Exhibit Accompanying Direct Testimony of Rick A. Vail

Latham One-Line Diagram and General Arrangement Drawing

June 2017

THIS EXHIBIT IS CONFIDENTIAL IN ITS ENTIRETY AND IS PROVIDED UNDER SEPARATE COVER

CONFIDENTIAL
Rocky Mountain Power
Exhibit RMP___(RAV-8)
Docket No. 17-035-40
Witness: Rick A. Vail

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

CONFIDENTIAL
Exhibit Accompanying Direct Testimony of Rick A. Vail

Shirley Basin, Freezeout and Standpipe One-Line Diagram, and General Arrangement Drawing

June 2017

THIS EXHIBIT IS CONFIDENTIAL IN ITS ENTIRETY AND IS PROVIDED UNDER SEPARATE COVER

Rocky Mountain Power
Exhibit RMP___(RAV-9)
Docket No. 17-035-40
Witness: Rick A. Vail

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

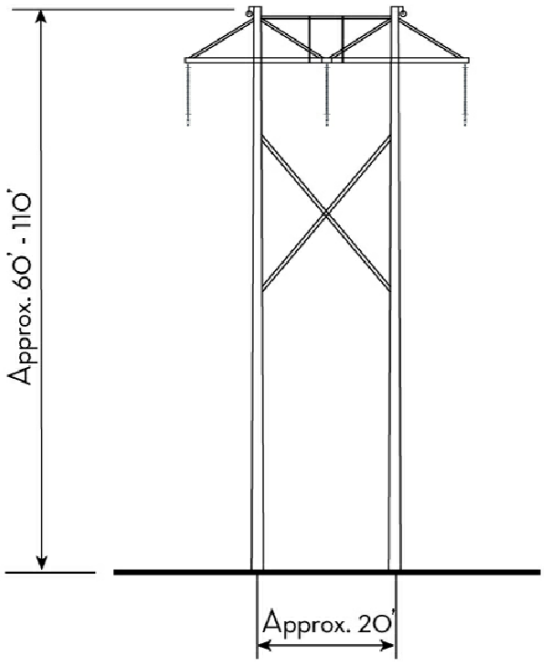
Exhibit Accompanying Direct Testimony of Rick A. Vail

230 kV Tower Design

June 2017

THIS DRAWING WAS PREPARED BY POWER ENGINEERS, INC. FOR A SPECIFIC PROJECT, TAKING INTO CONSIDERATION THE SPECIFIC AND UNIQUE REQUIREMENTS OF THE PROJECT. REUSE OF THIS DRAWING OR ANY INFORMATION CONTAINED IN THIS DRAWING FOR ANY PURPOSE IS PROHIBITED UNLESS WRITTEN PERMISSION FROM BOTH POWER AND POWER'S CLIENT IS GRANTED.

REV	REVISIONS	DATE	DRN	DSGN	CKD	APPD
A	ISSUED FOR REVIEW	06/22/17	JLQ	KB		



DSGN	KB	06/22/17	
DRN	JLQ	06/22/17	
CKD			
SCALE:	NTS		

FOR 8.5x11 DWG ONLY

REFERENCE DRAWINGS

POWER ENGINEERS

PACIFICORP

ENERGY GATEWAY WEST
AEOLUS TO JIM BRIDGER

230kV STRUCTURE

JOB NUMBER 145986

REV A

DRAWING NUMBER S7-1

FIGURE_01.dwg

Rocky Mountain Power
Exhibit RMP___(RAV-10)
Docket No. 17-035-40
Witness: Rick A. Vail

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

Exhibit Accompanying Direct Testimony of Rick A. Vail

Project Schedule

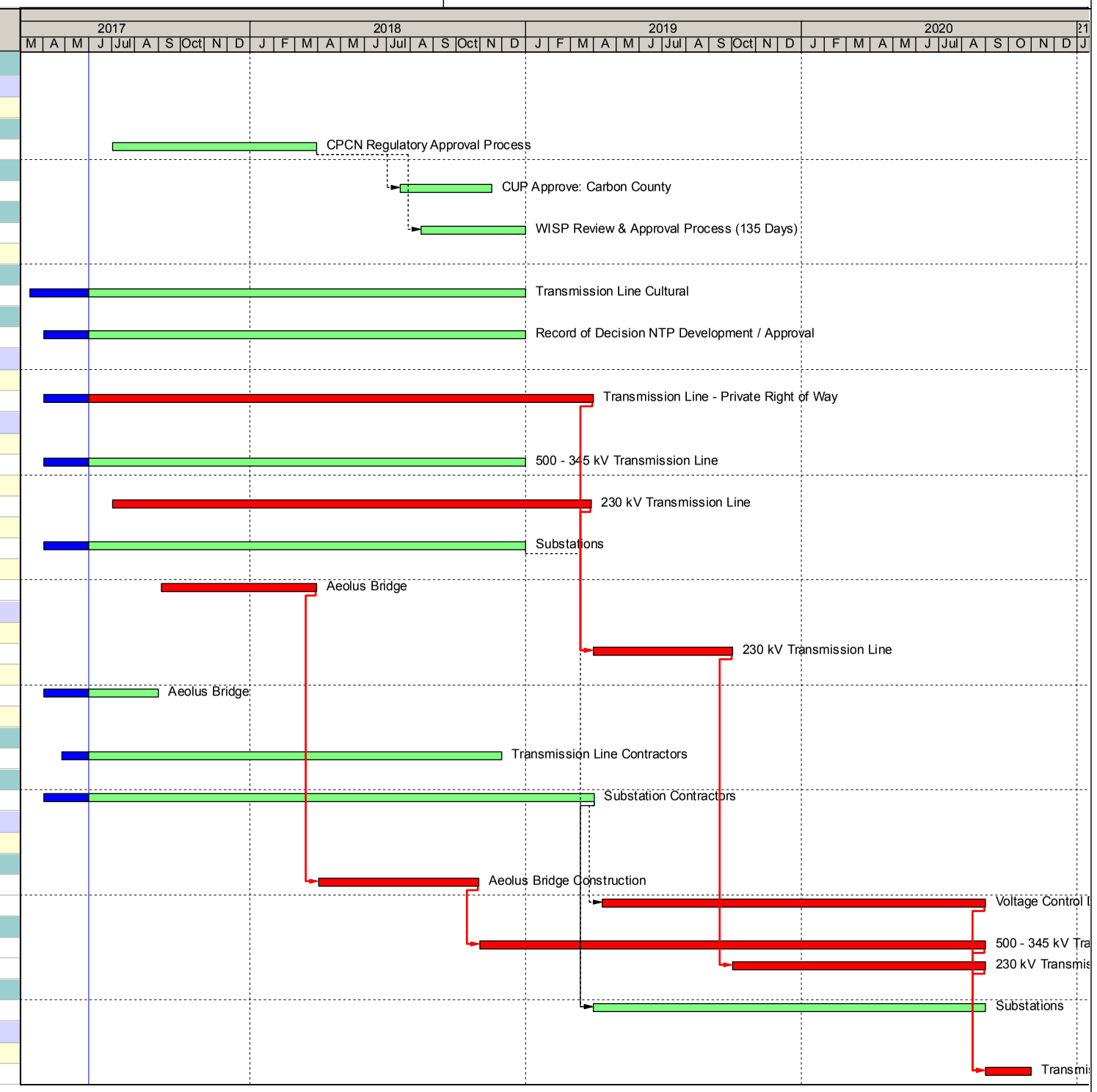
June 2017

PACIFICORP
A BERKSHIRE HATHAWAY ENERGY COMPANY

Project ID: AJB-1
Project Name: Aeolus to Jim Bridger
In Service Date: 31-Dec-20

Project Manager: Smith, Stuart
Project Controls Specialist: Burbank, Larry
Print Date: 26-Jun-17 10:50

Activity ID	Activity Name	Start	Finish
Aeolus to Jim Bridger		15-Mar-17 A	31-Oct-20
Permitting		15-Mar-17 A	31-Dec-18
Permits		03-Jul-17	31-Dec-18
Transmission Line - Certificate of Public Convenience and Necessity (CPCN)		03-Jul-17	30-Mar-18
P1020	CPCN Regulatory Approval Process	03-Jul-17*	30-Mar-18
Transmission Line - Conditional Use Permit (CUP)		18-Jul-18	16-Nov-18
P1050	CUP Approve: Carbon County	18-Jul-18*	16-Nov-18
Transmission Line - Wyoming Industrial Siting Permit (WISP)		15-Aug-18	31-Dec-18
P1080	WISP Review & Approval Process (135 Days)	15-Aug-18*	31-Dec-18
Record of Decision Requirements		15-Mar-17 A	31-Dec-18
Transmission Line - Cultural		15-Mar-17 A	31-Dec-18
P1130	Transmission Line Cultural	15-Mar-17 A	31-Dec-18
Transmission Line - Notice to Proceed (NTP) Mitigation Plans		03-Apr-17 A	31-Dec-18
P1680	Record of Decision NTP Development / Approval	03-Apr-17 A	31-Dec-18
Land Rights		03-Apr-17 A	31-Mar-19
Transmission Line - Private Right of Way		03-Apr-17 A	31-Mar-19
R1480	Transmission Line - Private Right of Way	03-Apr-17 A	31-Mar-19
Engineering		03-Apr-17 A	29-Mar-19
500 - 345 kV Transmission Line		03-Apr-17 A	31-Dec-18
E1540	500 - 345 kV Transmission Line	03-Apr-17 A	31-Dec-18
230 kV Transmission Line		03-Jul-17	29-Mar-19
E3000	230 kV Transmission Line	03-Jul-17*	29-Mar-19
Substations		03-Apr-17 A	31-Dec-18
E1620	Substations	03-Apr-17 A	31-Dec-18
Aeolus Bridge		05-Sep-17	30-Mar-18
E1660	Aeolus Bridge	05-Sep-17*	30-Mar-18
Procurement		03-Apr-17 A	01-Oct-19
230 kV Transmission Line		01-Apr-19	01-Oct-19
PR1320	230 kV Transmission Line	01-Apr-19	01-Oct-19
Aeolus Bridge		03-Apr-17 A	01-Sep-17
PR1400	Aeolus Bridge	03-Apr-17 A	01-Sep-17
500 kV Transmission Line - Procurement		03-Apr-17 A	01-Apr-19
Transmission Line Contractors		27-Apr-17 A	30-Nov-18
RFP1000	Transmission Line Contractors	27-Apr-17 A	30-Nov-18
Substation Contractors		03-Apr-17 A	01-Apr-19
SC1350	Substation Contractors	03-Apr-17 A	01-Apr-19
Construction		02-Apr-18	31-Aug-20
Transmission Line - Construction		02-Apr-18	31-Aug-20
Work by Others		02-Apr-18	31-Aug-20
C1800	Aeolus Bridge Construction	02-Apr-18	31-Oct-18
C1810	Voltage Control Device: EPC / Manufacture / Install	12-Apr-19*	31-Aug-20
Transmission Lines		01-Nov-18	31-Aug-20
C1900	500 - 345 kV Transmission Line Construction	01-Nov-18	31-Aug-20
C1910	230 kV Transmission Line Construction	02-Oct-19	31-Aug-20
Substations		01-Apr-19	31-Aug-20
C2000	Substations	01-Apr-19	31-Aug-20
Testing and Commissioning		01-Sep-20	31-Oct-20
Transmission Line - Testing and Commissioning		01-Sep-20	31-Oct-20
T2100	Transmission Line - Testing and Commissioning	01-Sep-20	31-Oct-20



Actual Work
Remaining Work
Critical Remaining Work
Act Milestone
Milestone

Data Date: 01-Jun-17
TASK filter: All Activities
Layout: Aeolus to Jim Bridger - CPCN Filing-1

Rocky Mountain Power
Exhibit RMP___(RAV-10) Page 1 of 1
Docket No. 17-035-40
Witness: Rick A. Vail

Rocky Mountain Power
Exhibit RMP___(RAV-11)
Docket No. 17-035-40
Witness: Rick A. Vail

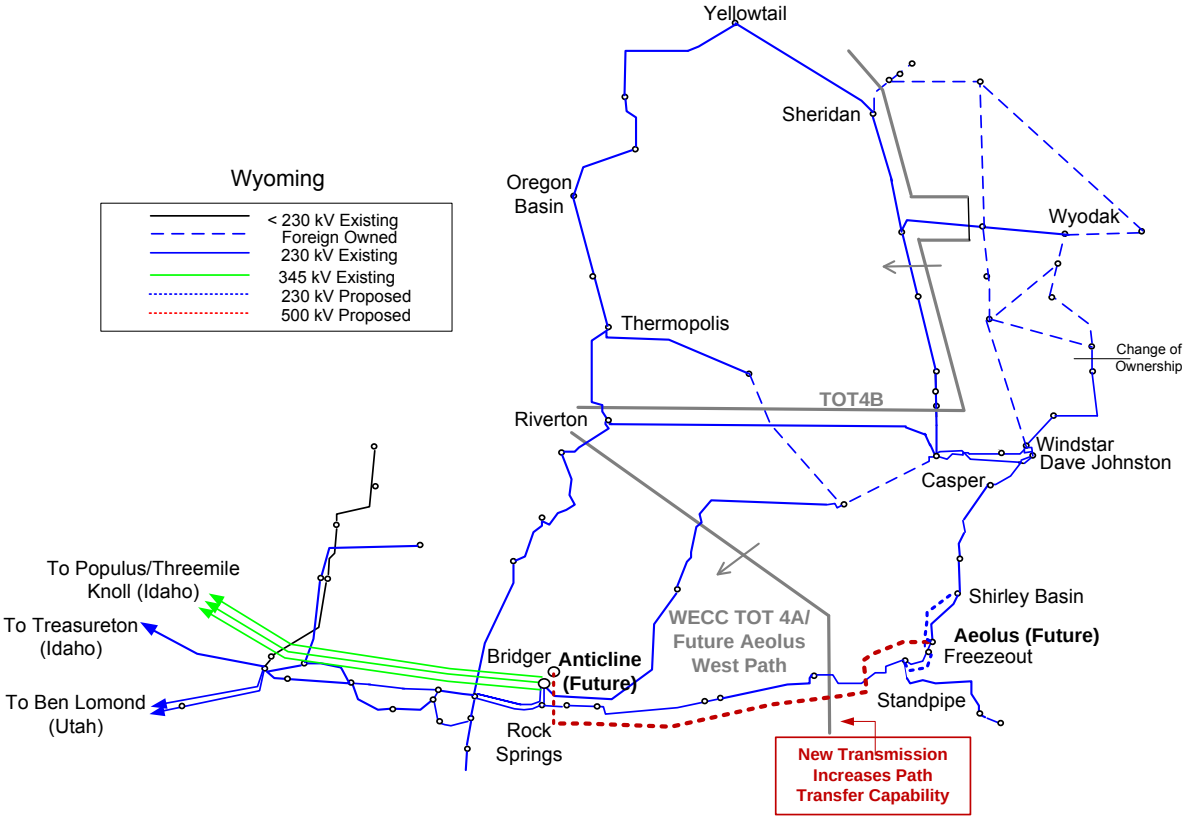
BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

Exhibit Accompanying Direct Testimony of Rick A. Vail

Wyoming Transmission Diagram

June 2017


Yellowtail
Sheridan
Wyoming
< 230 kV Existing
Foreign Owned
230 kV Existing
345 kV Existing
230 kV Proposed
500 kV Proposed
Oregon Basin
Wyodak
Thermopolis
Change of Ownership
TOT4B
Riverton
Windstar
Dave Johnston
Casper
To Populus/Threemile Knoll (Idaho)
To Treasureton (Idaho)
To Ben Lomond (Utah)
Shirley Basin
WECC TOT 4A/ Future Aeolus West Path
Aeolus (Future)
Freezeout
Bridger
Anticline (Future)
Standpipe
Rock Springs
New Transmission Increases Path Transfer Capability

Rocky Mountain Power
Exhibit RMP___(RAV-12)
Docket No. 17-035-40
Witness: Rick A. Vail

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

Exhibit Accompanying Direct Testimony of Rick A. Vail

Proposed Site and Terrain for the Transmission Projects

June 2017

C.ii.A: The Company is currently Aliquot parts

500-kV Transmission Line ROW on Federal Lands

T. 19 N., R. 92 W.,	sec. 4, S1/2NW1/4;
	sec. 4, Lots 1, 2, 3;
	sec. 6, SE1/4SW1/4, S1/2SE1/4;
T. 19 N., R. 93 W.,	sec. 10, S1/2SE1/4, S1/2SW1/4;
	sec. 12, S1/2NE1/4, NE1/4SW1/4, S1/2SW1/4, N2SE1/4, SW1/4SE1/4;
	sec. 16, NW1/4NW1/4;
	sec. 18, S1/2NE1/4, NE1/4SW1/4, NW1/4SE1/4;
	sec. 18, Lots 3, 4;
T. 19 N., R. 94 W.,	sec. 24, N1/2NW1/4;
T. 20 N., R. 88 W.,	sec. 2, Lots 1, 2, 3, 4;
	sec. 4, Lots 1, 2, 3, 4;
	sec. 6, N1/2SE1/4;
	sec. 6, Lots 1, 2;
T. 20 N., R. 89 W.,	sec. 2, S1/2SE1/4;
	sec. 8, S1/2SW1/4, SE1/4;
	sec. 10, NE1/4, S1/2NW1/4;
	sec. 18, N1/2NE1/4;
	sec. 18, Lot 1;
T. 20 N., R. 90 W.,	sec. 14, S1/2NE1/4, SE1/4NW1/4, N1/2SW1/4, NW1/4SE1/4;
	sec. 20, N1/2NE1/4, SW1/4NE1/4, S1/2NW1/4;
T. 20 N., R. 91 W.,	sec. 24, S1/2SW1/4, N1/2SE1/4, SW1/4SE1/4;
	sec. 26, N1/2NE1/4, N1/2NW1/4;
	sec. 28, SE1/4NE1/4, N1/2SW1/4, N1/2SE1/4, SW1/4SW1/4;
	sec. 30, SE1/4SE1/4;
	sec. 32, NW1/4NW1/4;
T. 20 N., R. 92 W.,	sec. 34, S1/2SW1/4, S1/2SE1/4;
T. 21 N., R. 83 W.,	sec. 4, SW1/4NW1/4, NW1/4SW1/4;
	sec. 4, Lots 3, 4;
	sec. 8, NW1/4NE1/4, E1/2NW1/4, SW1/4NW1/4, W1/2SW1/4;
T. 21 N., R. 84 W.,	sec. 24, SE1/4SE1/4;
	sec. 25, N1/2NE1/4, SW1/4NE1/4;
	sec. 26, SE1/4NE1/4, E1/2SW1/4, SW1/4SE1/4;
	sec. 32, NW1/4NE1/4, N1/2NW1/4;
	sec. 32, Lots 1, 5;

T. 21 N., R. 85 W.,	sec. 32, SW1/4NE1/4, W1/2NW1/4, SE1/4NW1/4, NW1/4SE1/4;
	sec. 32, Lots 3, 7;
	sec. 34, N1/2SW1/4, N1/2SE1/4;
	sec. 36, NE1/4NE1/4, S1/2NE1/4, SE1/4NW1/4, N1/2SW1/4;
T. 21 N., R. 86 W.,	sec. 32, S1/2NE1/4, S1/2NW1/4;
	sec. 34, S1/2NE1/4, S1/2NW1/4;
	sec. 32, S1/2NE1/4, SE1/4NW1/4, N1/2SW1/4,
T. 21 N., R. 87 W.,	SW1/4SW1/4;
	sec. 34, S1/2NE1/4, S1/2NW1/4;
T. 21 N., R. 88 W.,	sec. 36, SE1/4SE1/4;
T. 22 N., R. 82 W.,	sec. 2, SW1/4NW1/4;
	sec. 2, Lots 3, 4;
	sec. 4, SE1/4SE1/4;
	sec. 8, E1/2SE1/4, SW1/4SE1/4;
	sec. 10, NW1/4NW1/4;
	sec. 18, SE1/4NE1/4, E1/2SW1/4, N1/2SE1/4, SW1/4SE1/4;
	sec. 18, Lot 4;
T. 22 N., R. 83 W.,	sec. 24, NE1/4NE1/4, S1/2NE1/4, SE1/4NW1/4, N1/2SW1/4, SW1/4SW1/4;
	sec. 26, N1/2NE1/4, E1/2NW1/4, SW1/4NW1/4, NW1/4SW1/4;
	sec. 34, N1/2NW1/4, SW1/4NW1/4;
T. 23 N., R. 81 W.,	sec. 4, SW1/4NW1/4, NW1/4SW1/4;
	sec. 4, Lots 3, 4;
	sec. 8, W1/2NE1/4, SE1/4NW1/4, N1/2SW1/4, SW1/4SW1/4;
	sec. 18, E1/2NE1/4, SW1/4NE1/4, SE1/4SW1/4, W1/2SE1/4;
T. 23 N., R. 82 W.,	sec. 24, E1/2SE1/4, SW1/4SE1/4;
	sec. 26, SE1/4SE1/4;
	sec. 36, NW1/4NW1/4;
T. 24 N., R. 80 W.,	sec. 32, S1/2SW1/4,S1/2SE1/4;
T. 24 N., R. 81 W.,	sec. 34, S1/2SW1/4, S1/2SE1/4;
T. 19 N., R. 94 W.,	sec. 10, SW1/4SE1/4;
	sec. 14, SW1/4NW1/4, N1/2SW1/4, SE1/4SW1/4, SW1/4SE1/4;
	sec. 18, S1/2NE1/4, SE1/4NW1/4;
	sec. 18, Lots 2, 3;

T. 19 N., R. 95 W.,	sec. 14, S1/2SW1/4, SE1/4;
	sec. 16, S1/2SE1/4;
	sec. 20, N1/2NE1/4, N1/2NW1/4;
T. 19 N., R. 96 W.,	sec. 20, SW1/4, N1/2SE1/4, SW1/4SW1/4;
	sec. 22, N1/2SW1/4, N1/2SE1/4;
	sec. 24, S1/2NE1/4, S1/2NW1/4;
T. 19 N., R. 97 W.,	sec. 2, SW1/4NW1/4, W1/2SW1/4, SE1/4SW1/4;
	sec. 4, S1/2NE1/4, S1/2NW1/4;
	sec. 14, N1/2NE1/4, SE1/4NE1/4, NE1/4SE1/4;
	sec. 24, N1/2NW1/4, SE1/4NW1/4, NE1/4SW1/4;
	sec. 24, Lots 3, 4;

Access Roads on Federal Lands

T. 19 N., R. 92 W.,	sec. 2, S1/2NW1/4;
	sec. 2, Lots 2, 3;
	sec. 4, SW1/4NW1/4;
	sec. 4, Lots 1, 2, 3, 4;
	sec. 6, NE1/4SE1/4, S1/2SE1/4;
	sec. 8, NW1/4NW1/4, S1/2SW1/4;
	sec. 16, N1/2NW1/4;
T. 19 N., R. 93 W.,	sec. 2, SW1/4, NW1/4SE1/4, S1/2SE1/4;
	sec. 4, NE1/4SW1/4, S1/2SW1/4, N1/2SE1/4, SW1/4SE1/4;
	sec. 6, E1/2SW1/4, S1/2SE1/4;
	sec. 6, Lots 5, 6;
	sec. 8, N1/2NW1/4, NW1/4SW1/4, E1/2SW1/4;
	sec. 10, NE1/4NE1/4, E1/2SE1/4;
	sec. 12, NE1/4NE1/4, S1/2NE1/4, E1/2NW1/4, NW1/4NW1/4, E1/2SW1/4, N1/2SE1/4;
	sec. 16, E1/2NW1/4, N1/2SW1/4, W1/2SE1/4, SE1/4SE1/4;
	sec. 18, W1/2NE1/4, E1/2NW1/4, NE1/4SW1/4;
	sec. 18, Lots 1, 3;
T. 20 N., R. 88 W.,	sec. 2, Lots 3, 4;
	Sec. 4, NW1/4W1/4;
	sec. 4, Lot 1;
	sec. 6, SE1/4;
	sec. 6, Lots 1, 2;
	sec. 8, NW1/4NW1/4;

T. 20 N., R. 89 W.,	sec. 2, S1/2SE1/4;
	sec. 8, S1/2SW1/4, SE1/4;
	sec. 10, N1/2NE1/4, N1/2NW1/4, SW1/4NW1/4;
	sec. 14, W1/2NW1/4, W1/2SW1/4, SE1/4SW1/4;
	sec. 16, NE1/4NE1/4;
	sec. 18, Lots 3, 4;
	sec. 22, NE1/4NE1/4;
	sec. 30, W1/2NE1/4, N1/2SE1/4, SE1/4SE1/4;
	sec. 32, NW1/4NW1/4, S1/2NW1/4, NE1/4SW1/4, NW1/4SE1/4;
T. 20 N., R. 90 W.,	sec. 2, W1/2SW1/4;
	sec. 2, Lots 7, 8;
	sec. 8, NW1/4NW1/4;
	sec. 10, NE1/4NE1/4, S1/2NE1/4, W1/2SE1/4;
	sec. 18, Lots 2, 3, 4;
	sec. 20, S1/2NW1/4;
T. 20 N., R. 91 W.,	sec. 12, SE1/4SE1/4;
	sec. 24, NW1/4NW1/4, SW1/4SW1/4, NE1/4SE1/4;
	sec. 26, NE1/4NW1/4;
	sec. 28, NW1/4SW1/4;
	sec. 30, NE1/4NW1/4, SE1/4SE1/4;
	sec. 30, Lots 1, 2;
T. 20 N., R. 92 W.,	sec. 22, SE1/4SE1/4;
	sec. 24, E1/2NE1/4, SW1/4NE1/4, NE1/4SW1/4, S1/2SW1/4, NW1/4SE1/4;
	sec. 26, N1/2NE1/4, N1/2NW1/4;
	sec. 34, SE1/4NE1/4, S1/2SW1/4, NE1/4SE1/4, S1/2SE1/4;
T. 21 N., R. 83 W.,	sec. 4, SW1/4NW1/4, W1/2SW1/4, SE1/4SW1/4;
	sec. 4, Lots 3, 4;
	sec. 8, SW1/4NE1/4, E1/2NW1/4, SW1/4NW1/4, N1/2SW1/4, SW1/4SW1/4, N1/2SE1/4, SE1/4SE1/4;
	sec. 30, NW1/4NE1/4, NE1/4NW1/4;
T. 21 N., R. 84 W.,	sec. 24, SE1/4SE1/4;
	sec. 25, N1/2NE1/4;
	sec. 26, SE1/4NE1/4, NW1/4SW1/4, SE1/4SW1/4, S1/2SE1/4;
	sec. 30, SE1/4SW1/4;
	sec. 32, NW1/4NE1/4, NW1/4NW1/4;
	sec. 32, Lot 5;
	sec. 34, NW1/4NW1/4;

T. 21 N., R. 85 W.,	sec. 32, SW1/4NE1/4, W1/2NW1/4, SE1/4NW1/4, NW1/4SE1/4;
	sec. 32, Lot 3;
	sec. 36, NE1/4NE1/4, S1/2NE1/4, SE1/4NW1/4, N1/2SW1/4;
T. 21 N., R. 86 W.,	sec. 32, S1/2NE1/4, S1/2NW1/4;
	sec. 34, SW1/4NE1/4, S1/2NW1/4;
T. 21 N., R. 87 W.,	sec. 30, NE1/4NW1/4;
	sec. 30, Lots 2, 3;
	sec. 32, SW1/4NE1/4, SE1/4NW1/4, N1/2SW1/4, SW1/4SW1/4;
	sec. 34, N1/2NE1/4, SE1/4NE1/4, NW1/4, N1/2SW1/4;
T. 21 N., R. 88 W.,	sec. 18, SE1/4SE1/4;
	sec. 20, W1/2NW1/4;
	sec. 30, E1/2NW1/4;
	sec. 30, Lots 1, 2, 3;
	sec. 34, S1/2SW1/4, SW1/4SE1/4;
	sec. 36, NW1/4NE1/4, W1/2NW1/4, SE1/4NW1/4, W1/2SW1/4, SE1/4SW1/4, S1/2SE1/4;
T. 21 N., R. 89 W.,	sec. 32, NW1/4NW1/4;
	sec. 36, N1/2NE1/4, SW1/4NE1/4, NE1/4SW1/4, S1/2SW1/4, NW1/4SE1/4;
T. 22 N., R. 80 W.,	sec. 2, Lot 4
T. 22 N., R. 82 W.,	sec. 2, SW1/4NW1/4;
	sec. 2, Lots 2, 3, 4;
	sec. 4, E1/2SE1/4, SW1/4SE1/4;
	sec. 8, S1/2;
	sec. 10, SW1/4SW1/4;
	sec. 14, SW1/4SW1/4;
	sec. 18, NE1/4NE1/4, S1/2NE1/4, SE1/4SW1/4, SE1/4;
	sec. 18, Lot 4;
	sec. 20, N1/2NE1/4, N1/2NW1/4;
	sec. 30, SE1/4NW1/4, NE1/4SW1/4, N1/2SE1/4, SE1/4SE1/4;
	sec. 30, Lot 2;
	sec. 32, NE1/4NW1/4;
T. 22 N., R. 83 W.,	sec. 24, NE1/4, SE1/4NW1/4, N1/2SW1/4, SW1/4SW1/4;
	sec. 26, N1/2NE1/4, E1/2NW1/4, SW1/4NW1/4;

T. 23 N., R. 80 W.,	sec. 4, S1/2NW1/4, W1/2SW1/4;
	sec. 6, SE1/4NE1/4, N1/2SE1/4, SW1/4SE1/4;
	sec. 8, W1/2NE1/4, SW1/4NW1/4, N1/2SW1/4, W1/2SE1/4;
	sec. 10, N1/2NE1/4;
	sec. 12, NW1/4NW1/4;
	sec. 22, NW1/4SW1/4, S1/2SW1/4;
	sec. 26, SW1/4SW1/4;
	sec. 34, E1/2SE1/4;
T. 23 N., R. 81 W.,	sec. 2, SW1/4NE1/4, N1/2SE1/4, SE1/4SE1/4;
	sec. 2, Lot 2;
	sec. 4, SW1/4NE1/4, S1/2NW1/4, NE1/4SW1/4, N1/2SE1/4;
	sec. 4, Lots 1, 2, 3, 4;
	sec. 8, W1/2NE1/4, SE1/4NE1/4, SW1/4, W1/2SE1/4;
	sec. 12, N1/2NE1/4;
	sec. 18, E1/2NE1/4, SW1/4NE1/4, SE1/4SW1/4, SE1/4;
	sec. 20, S1/2SW1/4, S1/2SE1/4;
	sec. 30, NE1/4NW1/4;
	sec. 30, Lots 1, 2, 3, 4;
T. 23 N., R. 82 W.,	sec. 24, S1/2SE1/4;
	sec. 36, NE1/4, E1/2NW1/4, N1/2SW1/4;
T. 24 N., R. 80 W.,	sec. 32, SW1/4NW1/4, SW1/4, E1/2SE1/4, SW1/4SE1/4;
T. 24 N., R. 81 W.,	sec. 34, S1/2NE1/4, SE1/4NW1/4, SE1/4SW1/4, SE1/4;
T. 19 N., R. 94 W.,	sec. 2, Lot 4;
	sec. 10, NW1/4NE1/4, E1/2NW1/4, SW1/4NW1/4, W1/2SW1/4, SE1/4SE1/4;
	sec. 14, S1/2NE1/4, N1/2SW1/4, NW1/4SE1/4;
	sec. 18, S1/2NE1/4, E1/2NW1/4;
	sec. 18, Lot 1;
T. 19 N., R. 95 W.,	sec. 4, SW1/4SW1/4;
	sec. 10, S1/2NE1/4, S1/2NW1/4;
	sec. 12, SW1/4SW1/4;
	sec. 16, W1/2NW1/4;
	sec. 20, N1/2NE1/4, NW1/4;

T. 19 N., R. 96 W., sec. 18, SW1/4NE1/4NE1/4, W1/2NE1/4, SE1/4NE1/4, SE1/4NW1/4, NE1/4SW1/4, S1/2SE1/4;
sec. 18, Lots 3, 4;
sec. 20, NE1/4NW1/4, W1/2NW1/4, W1/2SW1/4;
sec. 22, NE1/4SW1/4, N1/2SE1/4;
sec. 24, SE1/4NE1/4, SE1/4NW1/4, NW1/4SE1/4, N1/2SW1/4;
sec. 28, N1/2NE1/4, N1/2NW1/4;
sec. 30, E1/2NE1/4;

T. 19 N., R. 97 W., sec. 2, SW1/4NW1/4, W1/2SW1/4, SE1/4SW1/4;
sec. 4, SW1/4NE1/4;
sec. 10, E1/2NE1/4;
sec. 14, NE1/4, N1/2NW1/4, SE1/4NW1/4;
sec. 24, NE1/4NW1/4;
sec. 24, Lots 2, 3, 4;

500-kV Transmission Line ROW and Access Roads on Private and State Lands

Township	Section	Parcel No.	County	TL	AR
23N 80W	3, 4, 5, 7, 11, 21, 27, 35	23800210000400	Carbon		x
23N 80W	16	23801610050000	Carbon		x
24N 80W	35	24803510000700	Carbon	x	
24N 80W	34	24801710000600	Carbon		x
24N 80W	31, 33, 34	24803110000500	Carbon	x	x
24N 80W	30	24803010000400	Carbon		x
24N 81W	36	24811610050000	Carbon	x	
24N 81W	35	24810110000300	Carbon	x	
24N 81W	33	24810310000500	Carbon	x	
23N 81W	1	23810110000300	Carbon		x
23N 81W	3, 5, 7, 9, 17, 19	23810310000400	Carbon	x	x
23N 82W	25, 35	23820110000300	Carbon	x	

22N 82W	3, 9, 15, 17, 19, 22, 23	22820110000300	Carbon	x	
22N 82W	21	22822110001100	Carbon		x
22N 82W	21	22821320000400	Carbon		x
22N 83W	23	22830110000300	Carbon	x	
22N 83W	25, 27, 33	22832510000400	Carbon	x	x
22N 83W	33	22833330000500	Carbon	x	
21N 83W	5, 9, 17	21830110000300	Carbon	x	x
21N 83W	7, 19	21830710000600	Carbon	x	
21N 83W	18	21831810000500	Carbon	x	
21N 83W	16	21831230050000	Carbon		x
21N 83W	20	21832010000800	Carbon		x
21N 84W	25	21842520000600	Carbon	x	
21N 84W	26	21842640001400	Carbon	x	
21N 84W	26	21842510010000	Carbon	x	
21N 84W	26	21842640001300	Carbon	x	
21N 84W	26	21842630001900	Carbon	x	
21N 84W	27	21841310000500	Carbon	x	
21N 84W	28, 29, 31, 33	21840710001200	Carbon	x	
21N 85W	35	21853510004500	Carbon	x	
21N 85W	31, 33, 35	21851910000800	Carbon	x	
21N 86W	36	21861610050000	Carbon	x	
21N 86W	25, 31, 33, 35	21861930000700	Carbon	x	x
21N 87W	36	21873610050000	Carbon	x	

21N 87W	33, 35	21870110000300	Carbon	x	
21N 87W	31	21870810000500	Carbon	x	
21N 87W	31	21873130008800	Carbon	x	
21N 87W	30	21873020006200	Carbon		x
20N 88W	1, 3, 5, 7	20880110000300	Carbon	x	x
20N 88W	6	20880620000400	Carbon	x	
21N 88W	19	21881910004600	Carbon		x
21N 88W	25, 33, 35	21880110000300	Carbon		x
21N 89W	25	21892510000800	Carbon		x
21N 89W	29, 31	21892830000700	Carbon		x
20N 89W	1, 3, 11, 15, 16	20890110000300	Carbon	x	x
20N 89W	9, 19, 29	20890910000600	Carbon	x	x
20N 89W	7	20890710000400	Carbon	x	
20N 90W	13	20900110000300	Carbon	x	
20N 90W	5, 7	2090-05-1-00-003-00	Sweetwater		x
20N 90W	3, 15, 21	2090-03-1-00-002-00	Sweetwater	x	x
20N 90W	16	2090-16-1-00-002-00	Sweetwater	x	
20N 90W	19	2090-17-4-00-010-00	Sweetwater	x	
20N 91W	18, 23, 27	2091-18-1-00-010-00	Sweetwater	x	x
20N 91W	13, 19, 23, 29	2091-01-1-00-003-00	Sweetwater	x	x
20N 91W	31	2091-31-1-00-011-00	Sweetwater	x	
20N 92W	25	2092-01-1-00-003-00	Sweetwater		x
20N 92W	36	2092-36-1-00-002-00	Sweetwater	x	

20N 92W	35	2092-03-1-00-012-00	Sweetwater	x	
19N 92W	3, 9, 17	19920110000300	Carbon	x	x
19N 92W	5, 7	19920510000400	Carbon	x	
19N 93W	7, 9, 11, 15, 17, 21	19930110000400	Carbon	x	x
19N 94W	3, 9, 13, 15, 23	1994-01-1-00-024-00	Sweetwater	x	x
19N 94W	16	1994-16-1-00-002-00	Sweetwater	x	
19N 94W	17	1994-17-1-00-011-00	Sweetwater	x	
19N 95W	13	1995-13-1-00-037-00	Sweetwater	x	
19N 95W	11, 15	1995-01-1-00-011-00	Sweetwater	x	x
19N 95W	5, 9, 17, 19, 21	1995-05-3-00-028-00	Sweetwater	x	x
19N 96W	17, 19, 21 23	1996-07-4-00-040-00	Sweetwater	x	x
19N 97W	13	1997-13-3-00-013-00	Sweetwater	x	
19N 97W	3, 11	1997-01-1-00-010-00	Sweetwater	x	
19N 97W	5, 7	1997-05-1-00-004-00	Sweetwater	x	x
19N 98W	1, 3, 5, 7, 11	1998-01-1-00-004-00	Sweetwater	x	x
19N 99W	1, 3, 5	1999-01-1-00-003-00	Sweetwater	x	
20N 99W	35	2099-01-1-00-003-00	Sweetwater		x
19N 100W	1, 3, 5	1900-01-1-00-003-00	Sweetwater	x	
20N 100W	19, 31	2000-01-1-00-003-00	Sweetwater	x	
20N 101W	13	2001-13-1-00-017-00	Sweetwater	x	
20N 101W	11, 25	2001-01-1-00-003-00	Sweetwater	x	x
21N 100W	31	2100-01-1-00-003-00	Sweetwater	x	

230kV Freeze-Out – Aeolus-Shirley Basin

Access Roads on Federal Lands

T. 24 N., R. 80 W., sec. 2, SE1/4NE1/4, SE1/4NW1/4, SW1/4, NW1/4SE1/4, S1/2SE1/4;

sec. 2, Lots 1, 2, 3, 4;

sec. 10, NE1/4, SE1/4NW1/4, N1/2SW1/4, E1/2SE1/4;

sec. 14, W1/2NW1/4;

sec. 22, N1/2NE1/4, SE1/4NE1/4, E1/2NW1/4, SW1/4, E1/2SE1/4;

sec. 26, W1/2NW1/4, E1/2SW1/4, W1/2SE1/4;

sec. 28, S1/2SW1/4;

T. 25 N., R. 79 W., sec. 2, SW1/4NE1/4, S1/2NW1/4, SW1/4;

sec. 2, Lots 1, 2, 3;

sec. 4, S1/2NW1/4, NE1/4SW1/4, NW1/4SE1/4, S1/2SE1/4;

sec. 4, Lot 4;

sec. 6, S1/2NE1/4, SE1/4NW1/4, NE1/4SW1/4;

sec. 6, Lots 1, 2, 6, 7;

sec. 10, NE1/4, E1/2NW1/4, NW1/4NW1/4, E1/2SW1/4, N1/2SE1/4, SW1/4SE1/4;

T. 23 N., R. 80 W., sec. 10, NE1/4

230-kV Transmission Line ROW on Federal Lands

T. 24 N., R. 80 W., sec. 2, S1/2NE1/4, SE1/4SW1/4, SE1/4;

sec. 2, Lot 1;

	sec. 10, E1/2SE1/4;
	sec. 14, W1/2NW1/4;
	sec. 22, E1/2NE1/4, NW1/4NE1/4, E1/2NW1/4, SW1/4,E1/2SE1/4;
	sec. 26, W1/2NW1/4, E1/2SW1/4, SW1/4SE1/4;
T. 25 N., R. 79 W.,	sec. 2, SW1/4NE1/4, S1/2NW1/4, SW1/4;
	sec. 2, Lots 1, 2, 3;
	sec. 10, N1/2NE1/4, SW1/4NE1/4, SE1/4NW1/4, N1/2SW1/4, SW1/4SW1/4, E1/2SE1/4, SW1/4SE1/4;
T. 26 N., R. 79 W.,	sec. 35, SE1/4SW1/4, SE1/4;
T. 23 N., R. 80 W.,	sec. 10, E1/2

Rocky Mountain Power
Exhibit RMP___(RAV-13)
Docket No. 17-035-40
Witness: Rick A. Vail

BEFORE THE PUBLIC SERVICE COMMISSION
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ROCKY MOUNTAIN POWER

Exhibit Accompanying Direct Testimony of Rick A. Vail

Geological Reports

June 2017

THIS EXHIBIT IS VOLUMINOUS AND IS PROVIDED ON CD ONLY

Rocky Mountain Power
Exhibit RMP___(RAV-14)
Docket No. 17-035-40
Witness: Rick A. Vail

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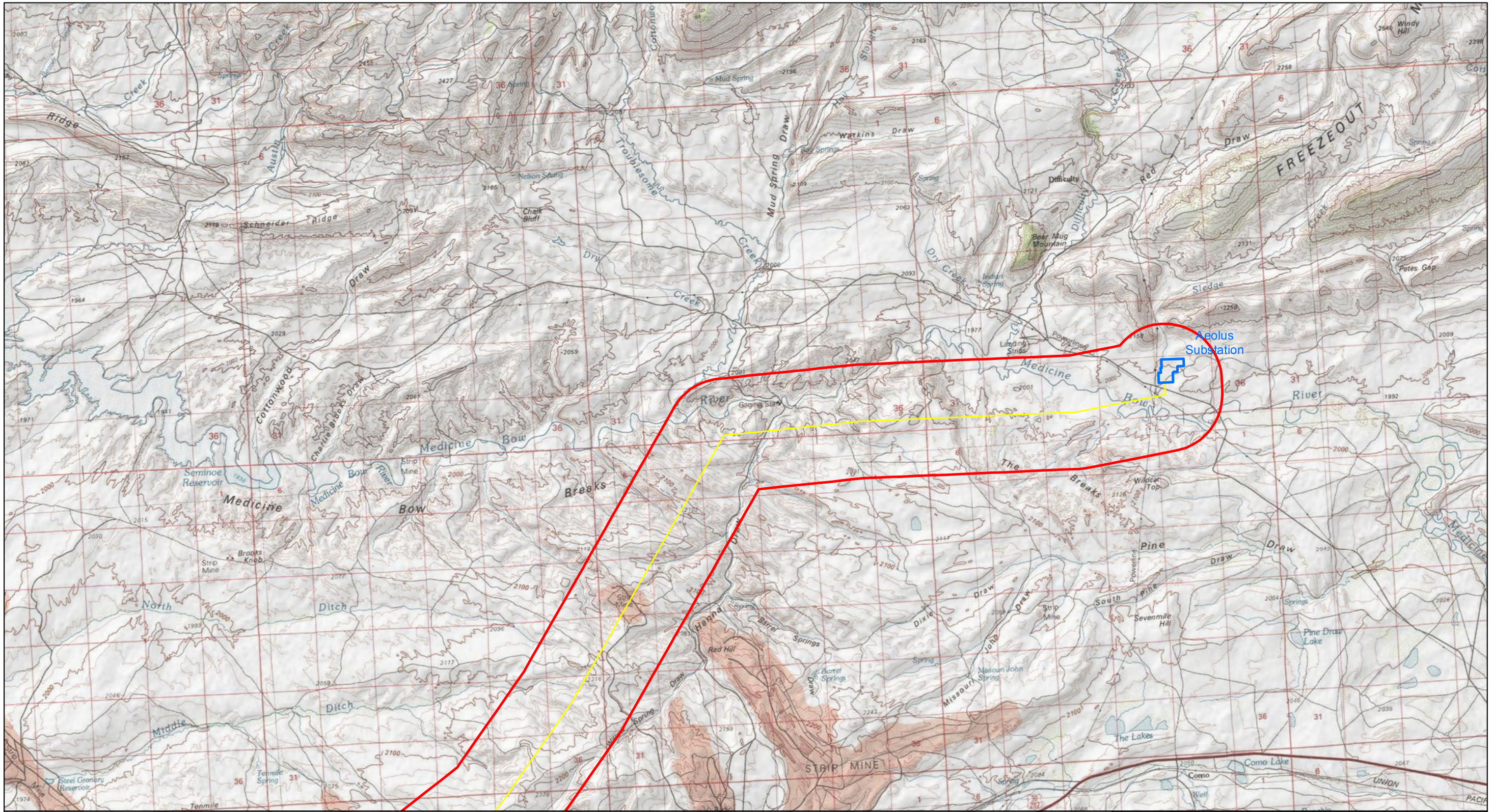
Mineral Deposit Mapbook

June 2017



Centerline

1 Mile Buffer

Wyoming State Geological Survey

Active Coal Mines

USGS MRDS Commodity

Silica

Stone, Crushed/Broken

Uranium

Adit

Gravel Pit

Gravel/Borrow pit - Undifferentiated

Mine Shaft

Open Pit Mine

Prospect Pit

Quarry

Sand Pit

N W E S

0 1 2

Miles

Gateway West Transmission Line Project

Aeolus to Jim Bridger Project

Page 1 of 8

ROCKY MOUNTAIN POWER
A DIVISION OF PACIFICORP

POWER ENGINEERS

Date: 5/10/2017

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USGS MRDS Commodity

Wyoming State Geological Survey

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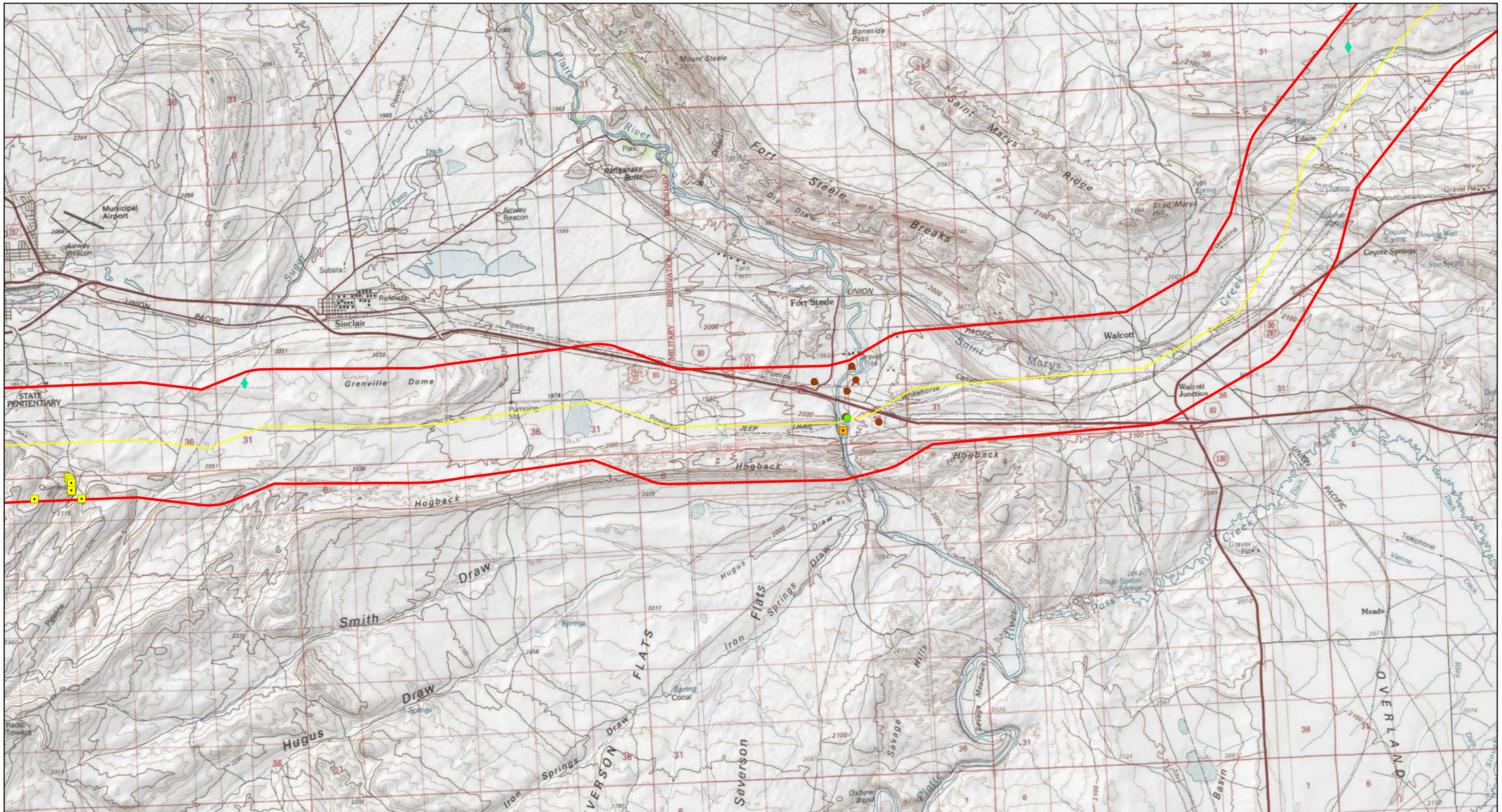

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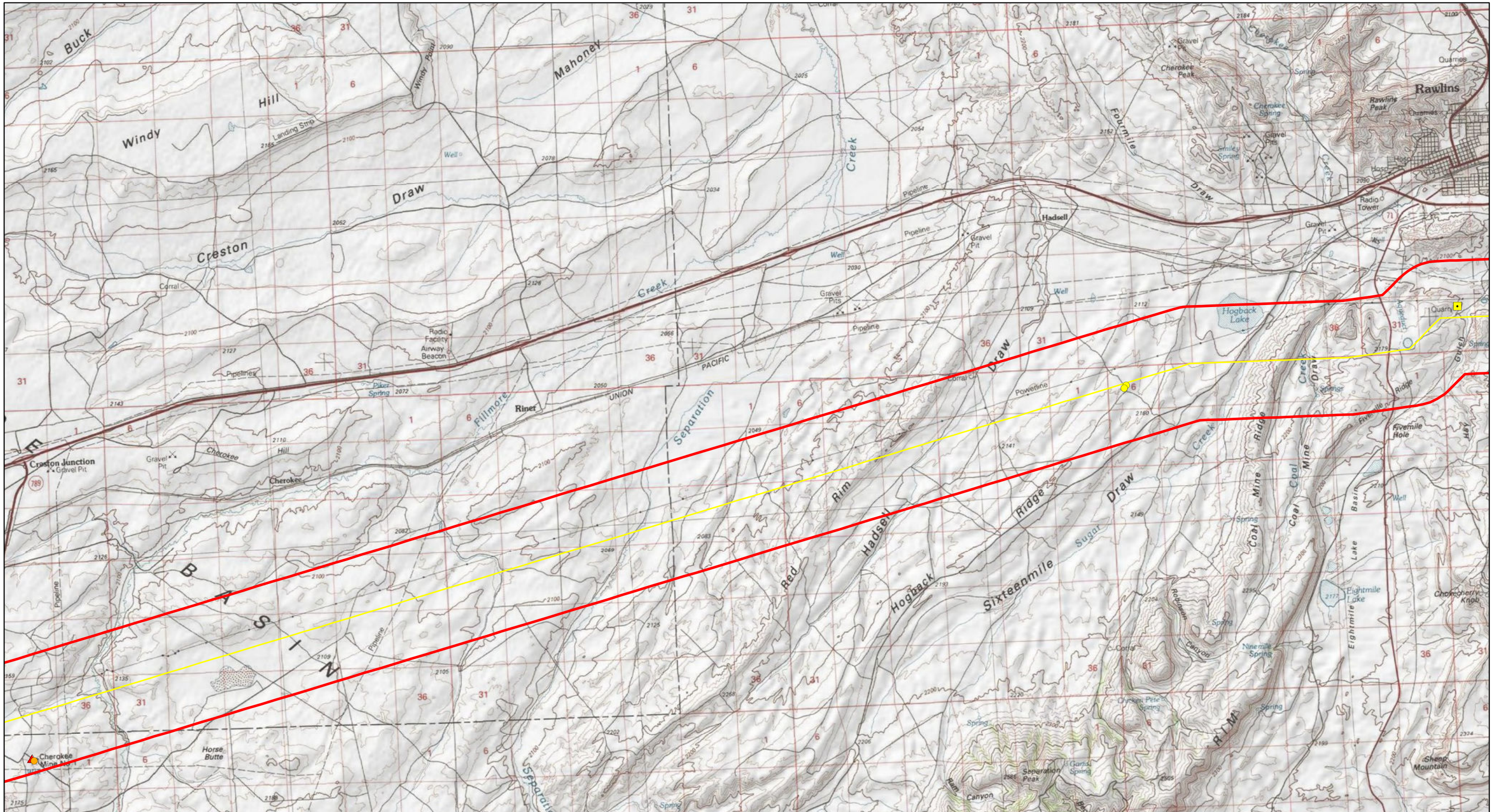

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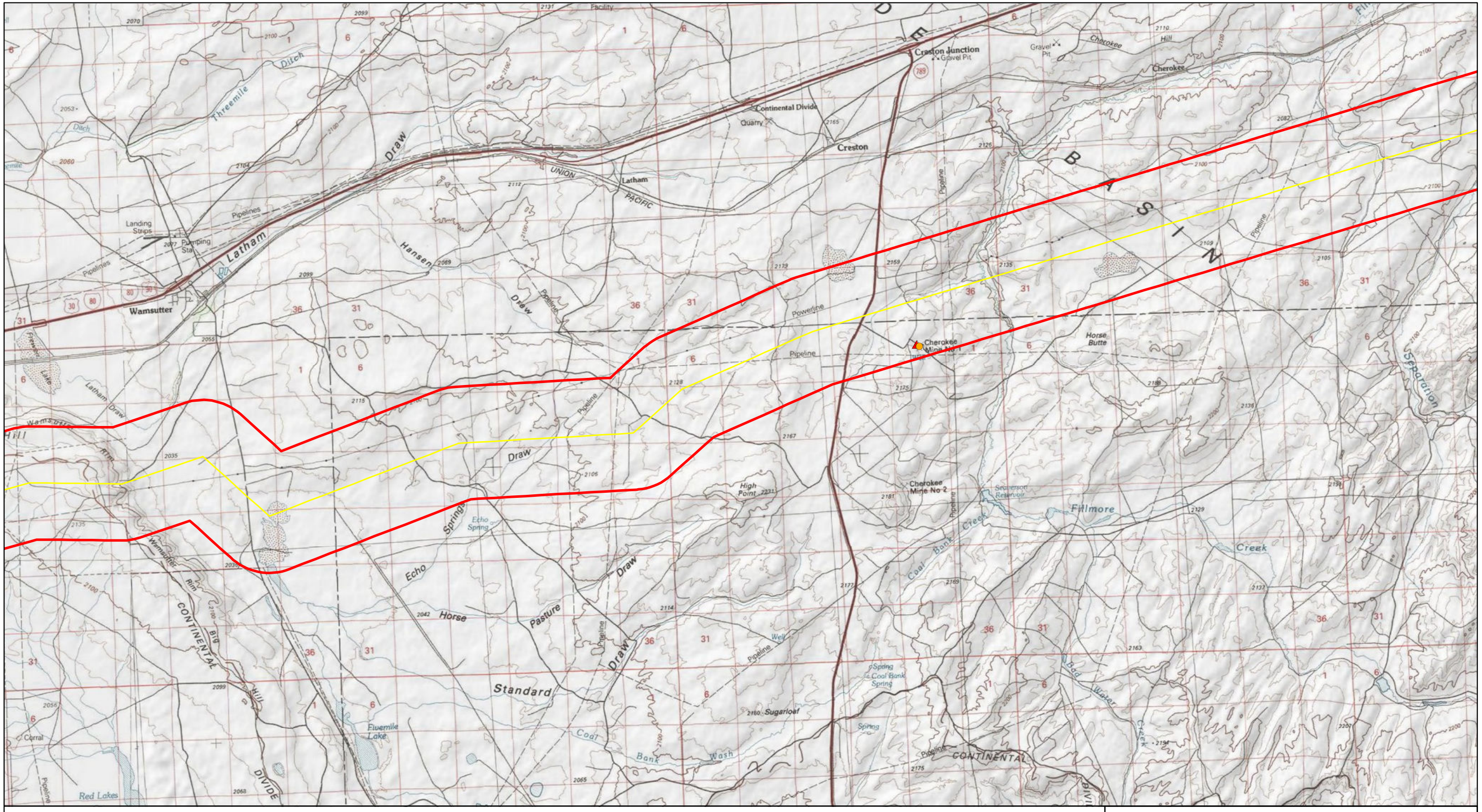

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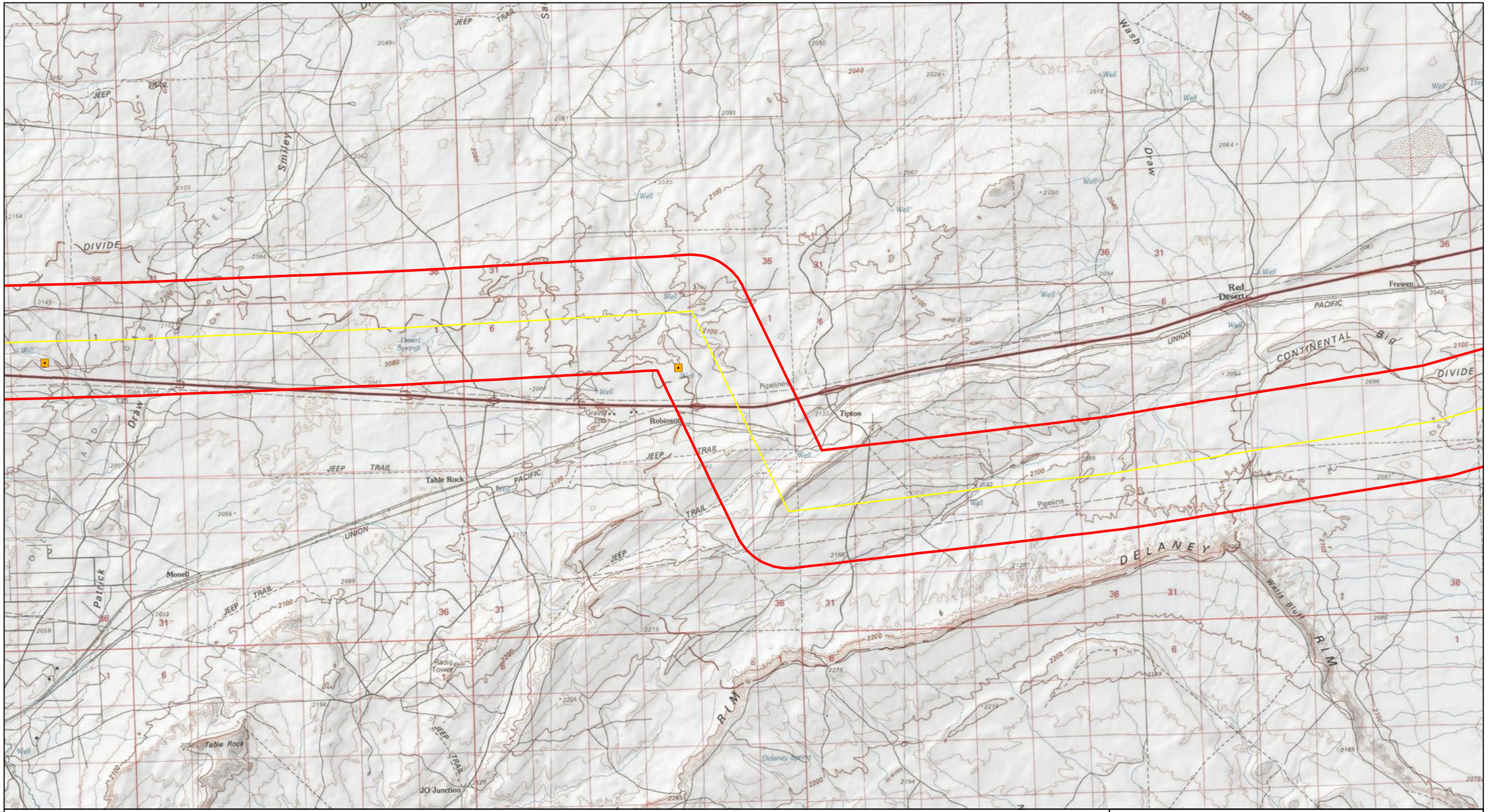

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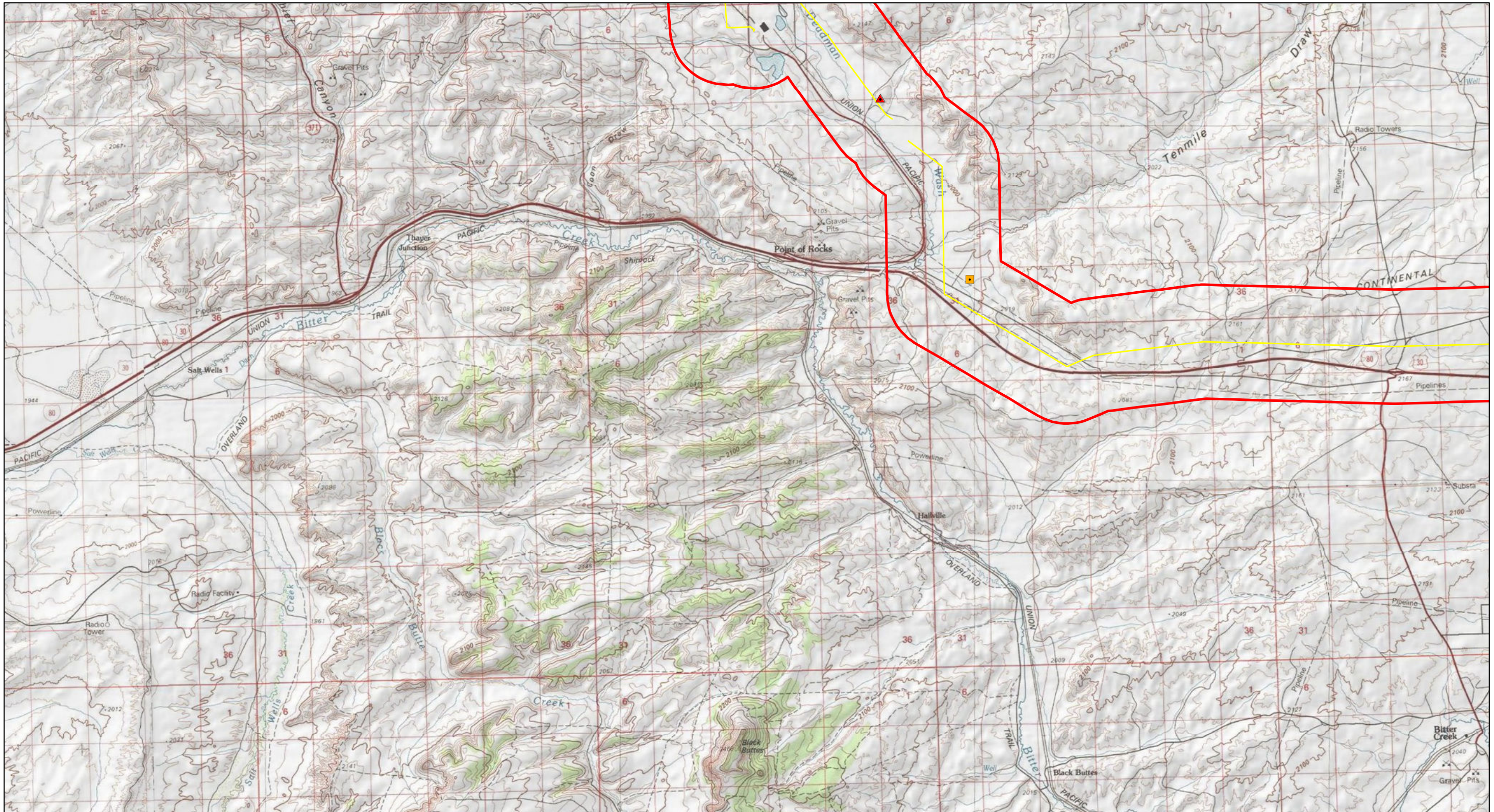

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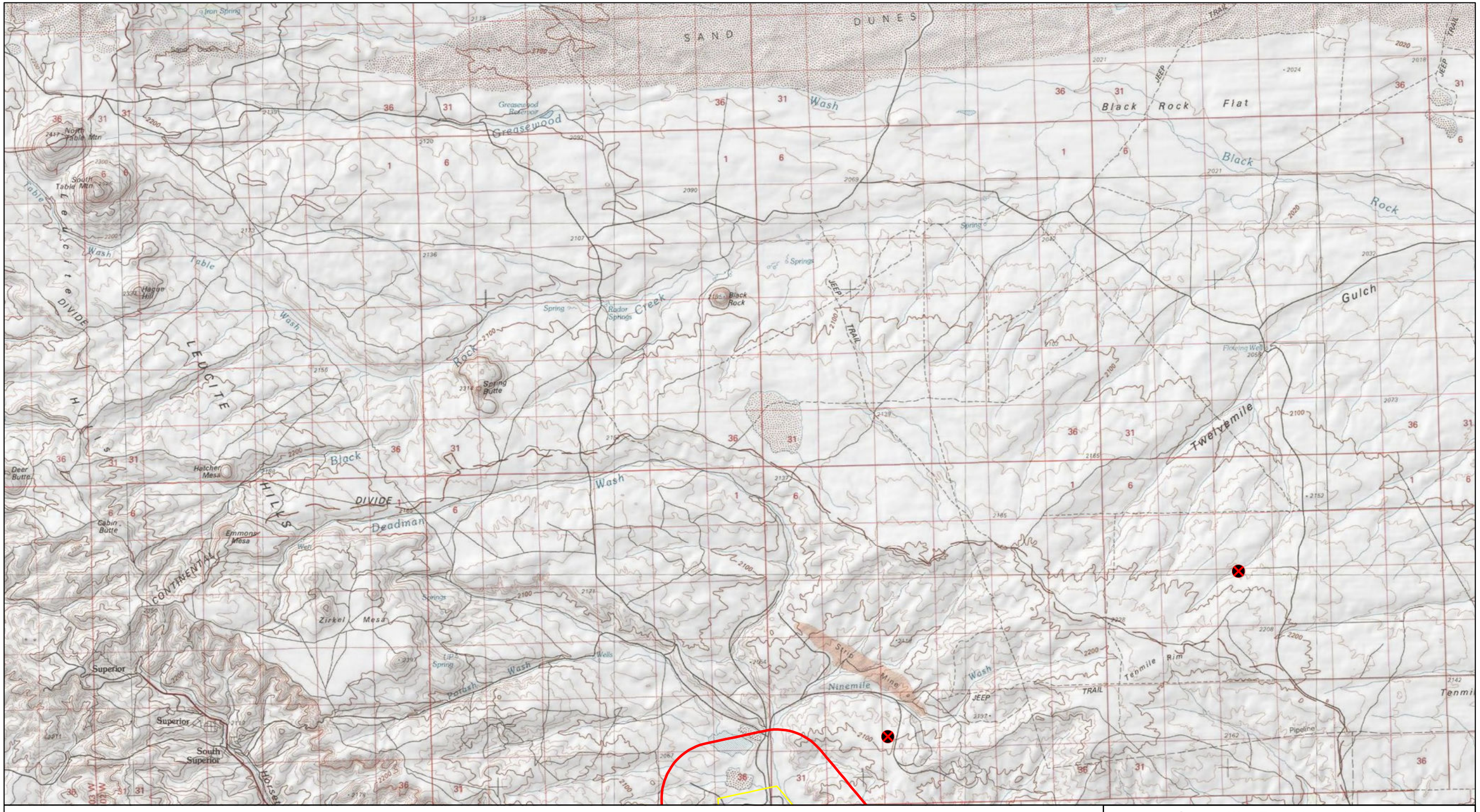

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Miles

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Aeolus to Jim Bridger Project
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POWER ENGINEERS

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Rocky Mountain Power
Exhibit RMP___(RAV-15)
Docket No. 17-035-40
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BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

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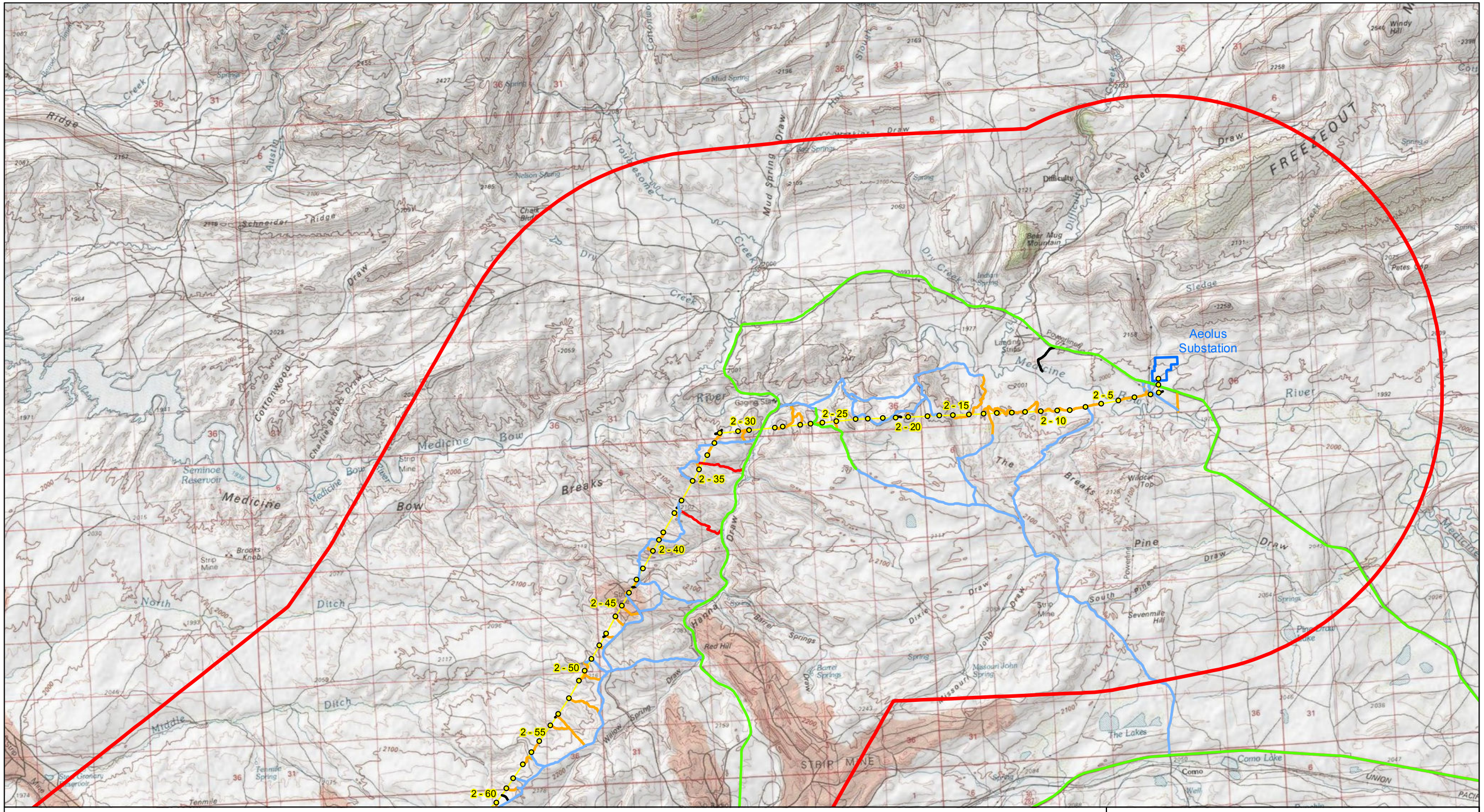
Topographical Mapbook

June 2017



Structure (Every 5th labled)

Centerline

5 Mile Buffer

Access Roads

Existing Road

Secondary

Temporary

Improve Existing

New Road

N W E S

0 1 2

Miles

Gateway West Transmission Line Project

Aeolus to Jim Bridger Project

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ROCKY MOUNTAIN POWER
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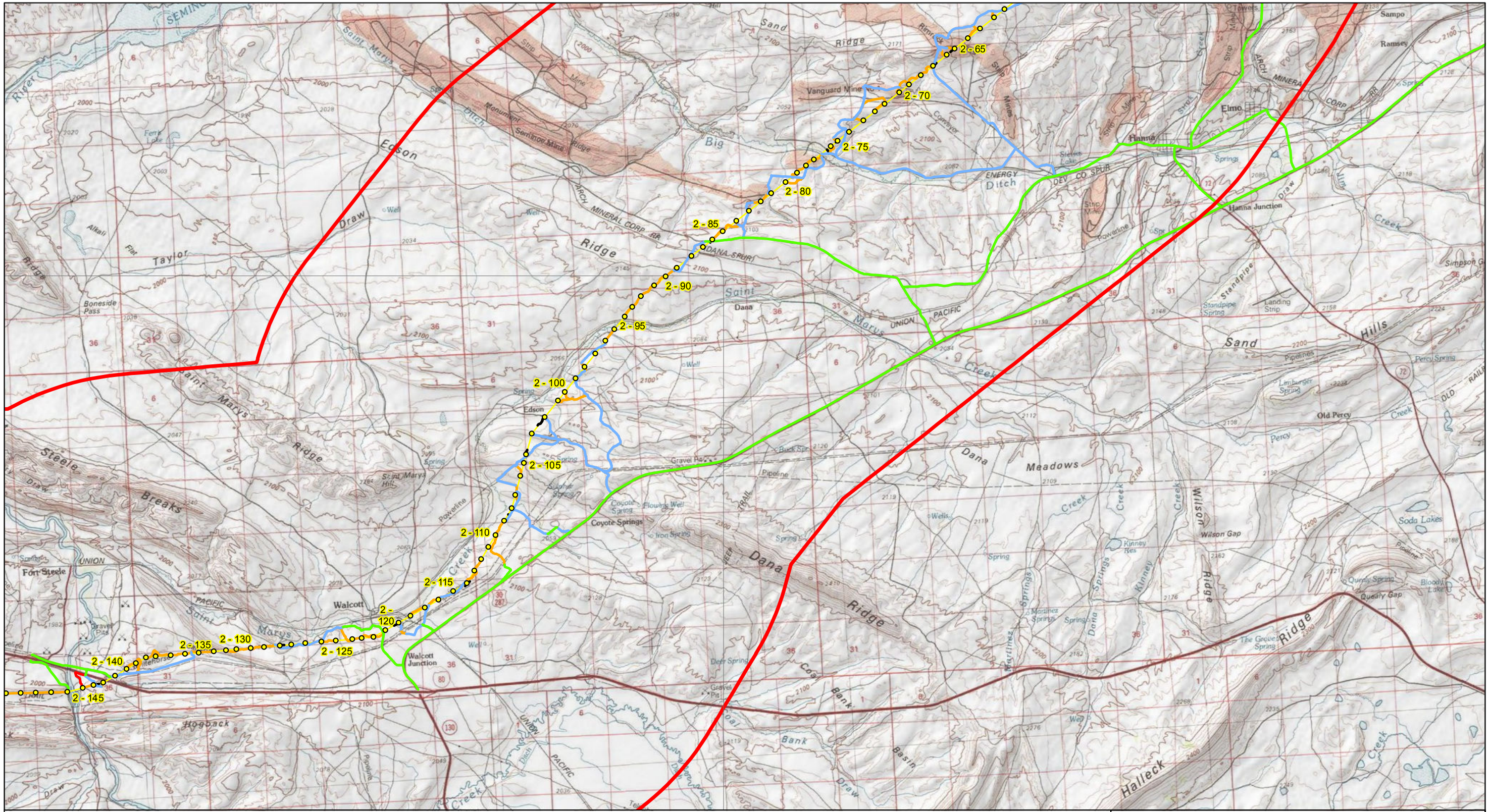

Structure (Every 5th labled)

Centerline

5 Mile Buffer

Access Roads

Existing Road

Secondary

Temporary

Improve Existing

New Road

N
W E
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0 1 2
Miles

Gateway West Transmission Line Project

Aeolus to Jim Bridger Project
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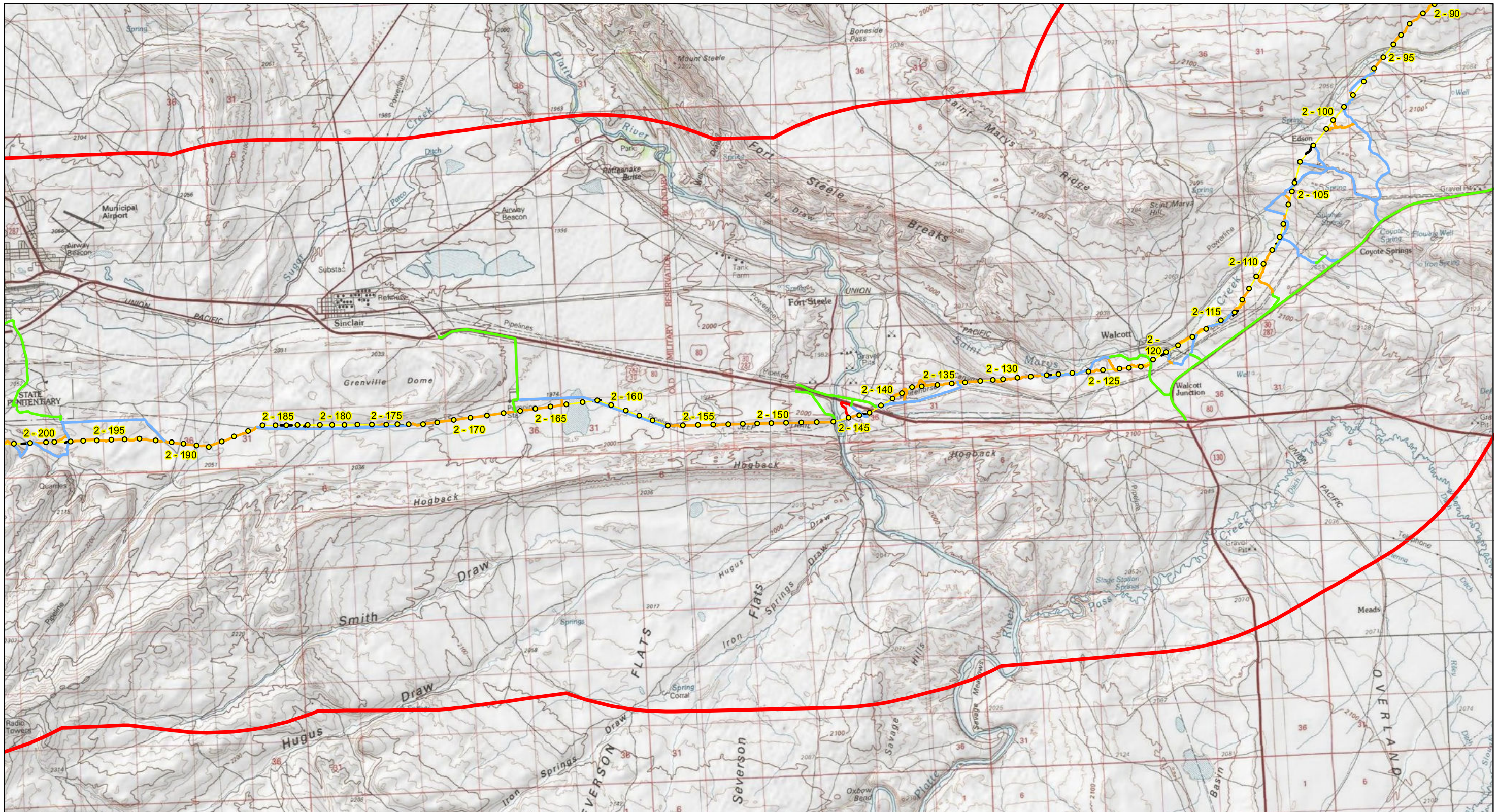

Structure (Every 5th labled)

Centerline

5 Mile Buffer

Access Roads

Existing Road

Secondary

Temporary

Improve Existing

New Road

N
W E
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0 1 2
Miles

Gateway West Transmission Line Project

Aeolus to Jim Bridger Project
Page 3 of 8

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POWER ENGINEERS

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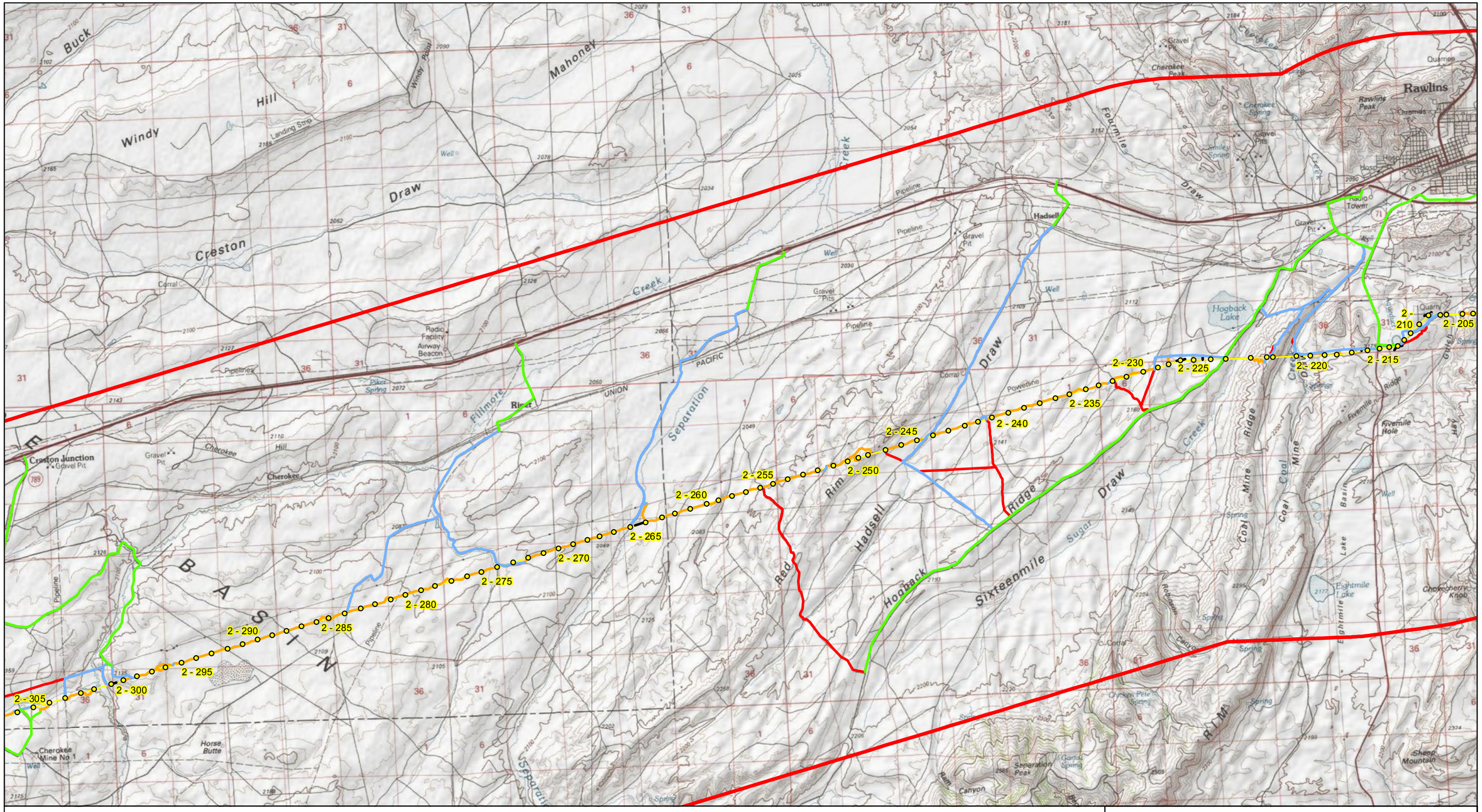

Structure (Every 5th labled)

Centerline

5 Mile Buffer

Access Roads

Existing Road

Secondary

Temporary

Improve Existing

New Road

N
W E
S

0 1 2
Miles

Gateway West Transmission Line Project

Aeolus to Jim Bridger Project
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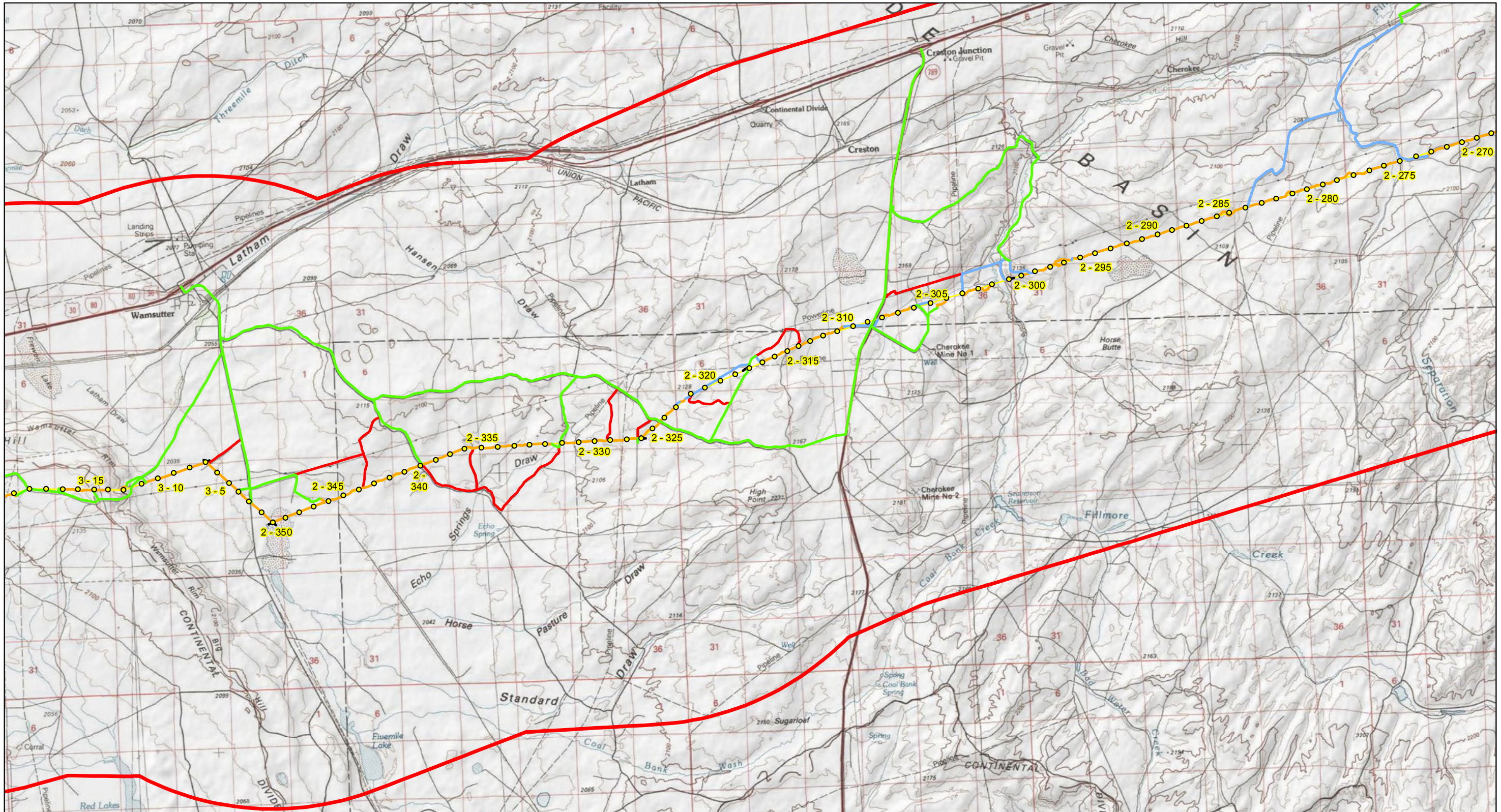

Structure (Every 5th labled)

Centerline

5 Mile Buffer

Access Roads

Existing Road

Secondary

Temporary

Improve Existing

New Road

N
W E
S

0 1 2
Miles

Gateway West Transmission Line Project

Aeolus to Jim Bridger Project
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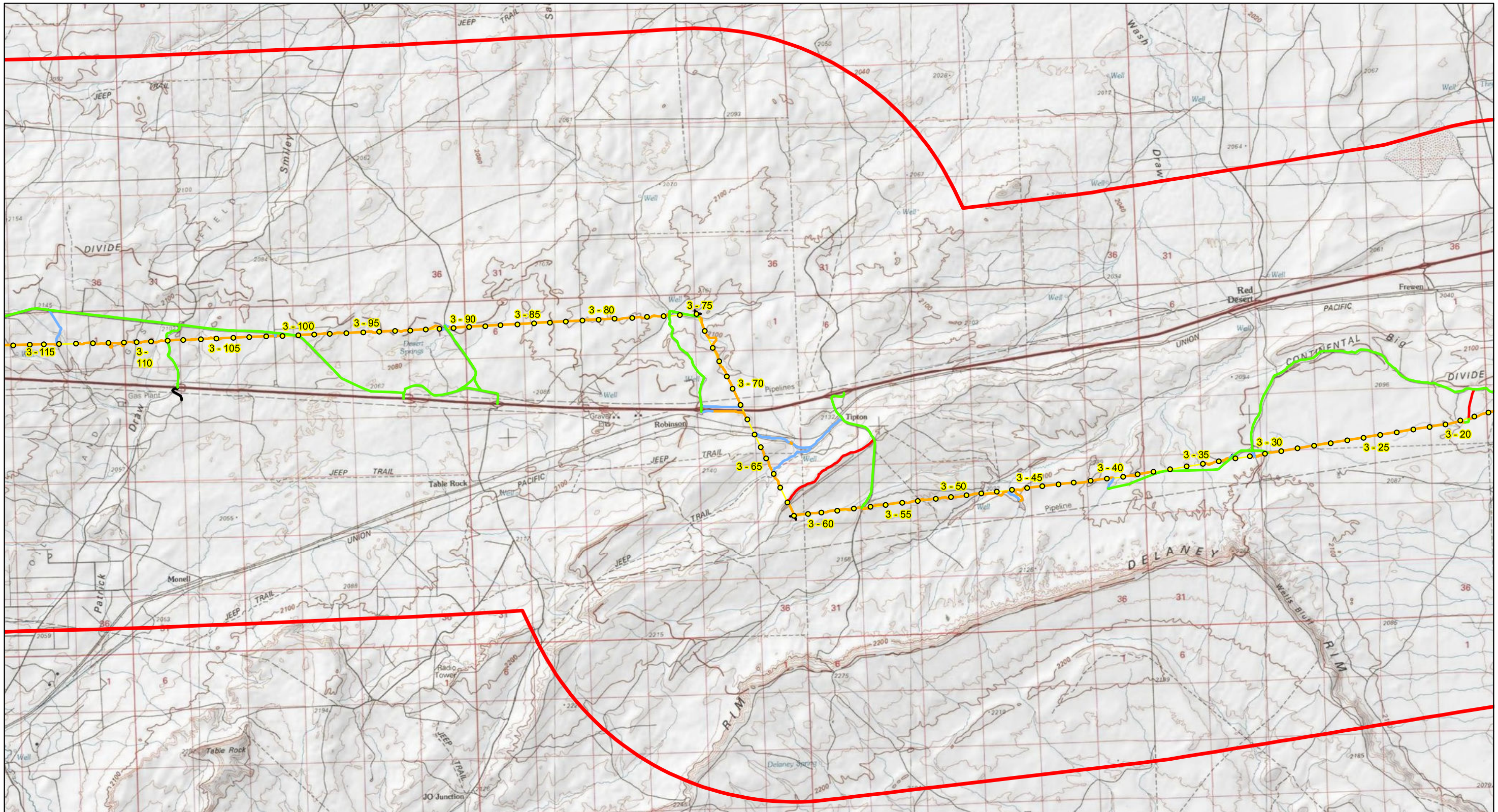

Structure (Every 5th labled)

Centerline

5 Mile Buffer

Access Roads

Existing Road

Secondary

Temporary

Improve Existing

New Road

N W E S

0 1 2
Miles

Gateway West Transmission Line Project

Aeolus to Jim Bridger Project
Page 6 of 8

ROCKY MOUNTAIN POWER
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Rocky Mountain Power
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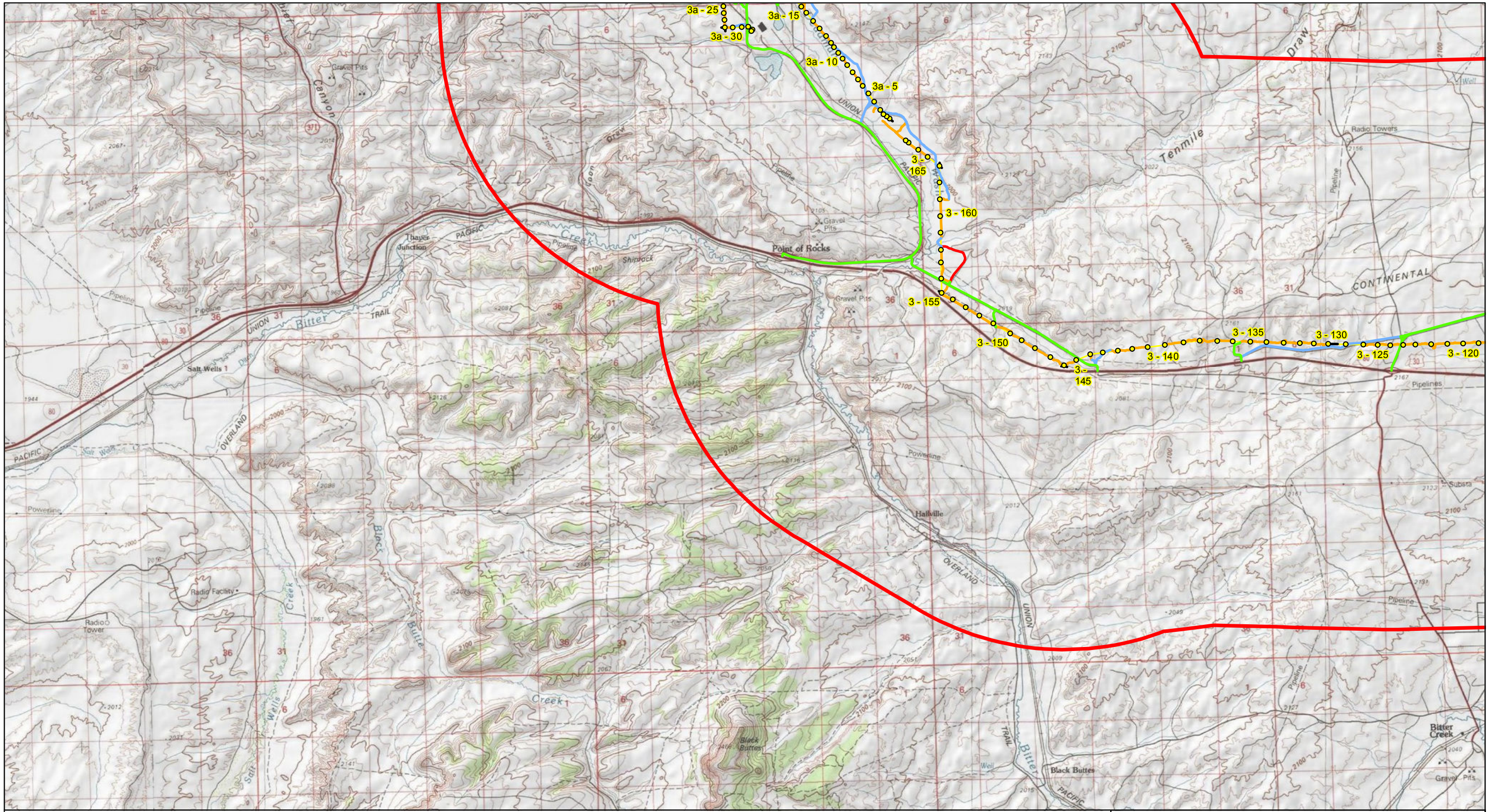

Structure (Every 5th labled)

Centerline

5 Mile Buffer

Access Roads

Existing Road

Secondary

Temporary

Improve Existing

New Road

N
W E
S

0 1 2
Miles

Gateway West Transmission Line Project

Aeolus to Jim Bridger Project
Page 7 of 8

ROCKY MOUNTAIN POWER
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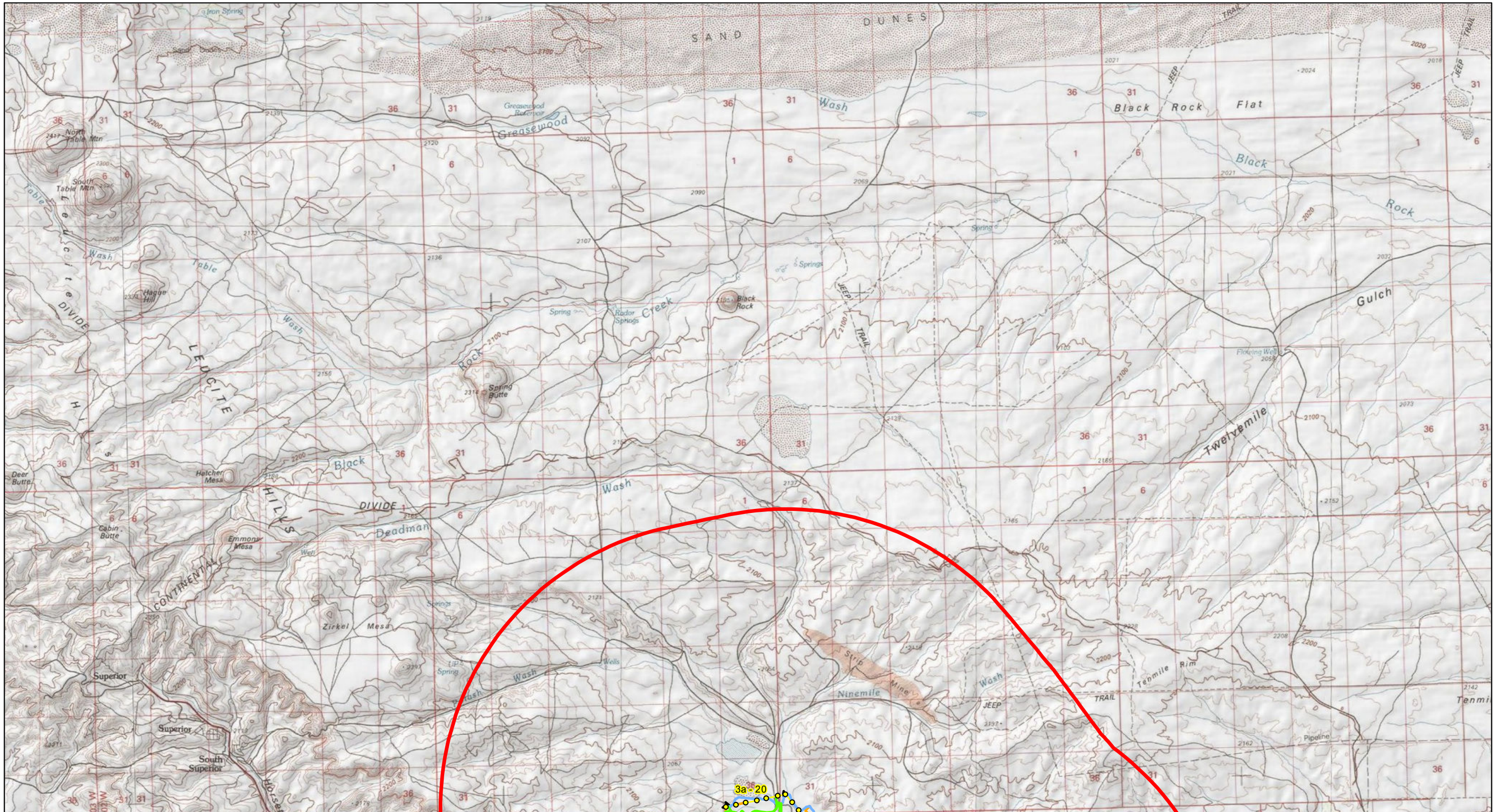

Structure (Every 5th labled)

Centerline

5 Mile Buffer

Access Roads

Existing Road

Secondary

Temporary

Improve Existing

New Road

N W E S

0 1 2 Miles

Gateway West Transmission Line Project

Aeolus to Jim Bridger Project
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BEFORE THE PUBLIC SERVICE COMMISSION
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Mitigation Plans

June 2017

Table 4-1. Environmental Protection Measures for Segments 1, 2, 3, and 3A

GATEWAY WEST TRANSMISSION LINE PROJECT

1	2	3-5			6-8		
		Application Phase			Applicable to Land Ownership		
EPM Number	Environmental Protection Measures	Design and Engineering	Construction	Operations and Maintenance	Federal Land and all Land in Wyoming and Idaho Segments 6, 8, and 9	State Land in Idaho	Private Land in Idaho Segments 4, 5, 7, and 10
OPERATIONS AND MAINTENANCE							
G-1	Resource Management Plan (as amended) design criteria, Best Management Practices (BMPs), and mitigation requirements will apply on BLM-managed lands.	•	•	•	•		
G-3	Third-party Environmental Compliance Inspection Contractor (CIC) Monitors approved by the Agencies will monitor construction activities. Monitoring activities will be structured in accordance with the Environmental Compliance Management Plan included as Appendix C of the Plan of Development.		•		•		
G-4	All wildlife and plant surveys/preconstruction surveys will be considered as “casual use” activities and will not be restricted or prevented to occur due to overlapping season and temporal restrictions.		•		•		
OM-1	The Companies will comply with the road maintenance standards of the federal or state agency controlling the land.		•	•	•	•	•
OM-2	Roads will be maintained to have crossroad drainage in order to minimize the amount of channeling or ditches needed. Water bars will be installed at all alignment changes (curves), significant grade changes, and as requested by the federal or state agency.			•	•	•	•
OM-3	All access road drainage structures, constructed and installed for the Companies’ use only, will be maintained or repaired by the Companies during O&M activities or emergency response.			•	•	•	•
OM-4	Although routine and corrective O&M is of limited duration and impact, the Companies will attempt to adhere to specific closure periods and areas and are proposing not to conduct any routine and corrective O&M activities during the timeframes and at the locations identified in Appendix R of the Plan of Development to the greatest extent practical. The appropriate federal or state agency will notify the Companies of any spatial or temporal restrictions that are in effect for the Project area (e.g., fire restrictions) that would be applicable to corrective O&M activities.		•	•	•	•	
OM-5	Existing improvements (fences, gates, etc.) will be repaired or replaced if they are damaged by O&M activities, as agreed to by the parties involved.			•	•	•	•
OM-6	The Agencies may restrict general public access to closed federal or state roads and access roads that the Companies maintain (the Companies will maintain access roads constructed for the Companies’ use only). In cases of restricted access, the Companies will physically close the road with a gate. Gates will be locked with both a lock supplied by the Companies and with a federal agency lock. Access management will be updated as necessary to reflect current road closures and gate locations.		•	•	•	•	

Table 4-1. Environmental Protection Measures for Segments 1, 2, 3, and 3A

GATEWAY WEST TRANSMISSION LINE PROJECT

1	2	3-5			6-8		
		Application Phase			Applicable to Land Ownership		
EPM Number	Environmental Protection Measures	Design and Engineering	Construction	Operations and Maintenance	Federal Land and all Land in Wyoming and Idaho Segments 6, 8, and 9	State Land in Idaho	Private Land in Idaho Segments 4, 5, 7, and 10
OM-7	Any integrated vegetation management (IVM) control method, including those listed in Appendix R of the Plan of Development, may be used to control the growth of trees and tall shrubs to maintain clearances (the IVM recommended wire and border zones as indicated in Appendix R of the Plan of Development) and improve access to facilities.			•	•	•	•
OM-8	Any IVM control method including those listed in Appendix R of the Plan of Development may be used to control the growth of additional vegetation to maintain clearances, the IVM recommended wire and border zones as indicated in Appendix R, and improve access to facilities.			•	•	•	•
OM-9	Where possible, low-growing vegetation and small tree species within the right-of-way (ROW) that will not grow into the minimum required clearance distance will be left in place; trees may be removed on a subsequent maintenance cycle as they increase in size. Hazard trees are typically those trees or snags within or adjacent to the ROW that are likely to interfere with or fall into transmission lines or associated facilities. Hazard trees and other "hot spots" (high priority areas requiring vegetation management actions) are identified during routine line inspections and removed annually. In addition to hazard trees, other critical conditions that may require immediate attention include trees that interfere with transmission conductors and trees whose growth will not allow safe clearance until the next scheduled maintenance cycle.			•	•	•	•
OM-10	Any vegetation control method may be used for vegetation maintenance on access roads; this is typically scheduled at the same time as vegetation maintenance within the ROW. However, in cases where vegetation grows quickly, removal may occur annually. Vegetation that will not interfere with the safe operation of vehicles and equipment will be left in place.			•	•	•	•
OM-11	Slash will be lopped and scattered throughout the surrounding land. Stumps resulting from vegetation treatments will not be over 1 foot tall (unless the tree is not able to be safely cut at or below one foot from the ground surface), and lopped slash will be left as close to the ground as possible. Lopped slash will be a maximum of 18 inches in length for small trees and limb wood. If the federal land managing agency determines that fuel levels are unacceptable, they shall notify the Companies and develop a mutually agreed upon method to reduce fuels. This may include, but is not limited to, chipping.			•	•	•	•
OM-12	Hazard trees will be felled in a direction away from the ROW. Slash and limbs that fall within the ROW will be treated as described above; boles of trees greater than 8 inches will be left in place.			•	•	•	•

Table 4-1. Environmental Protection Measures for Segments 1, 2, 3, and 3A

GATEWAY WEST TRANSMISSION LINE PROJECT

1	2	3-5			6-8		
		Application Phase			Applicable to Land Ownership		
EPM Number	Environmental Protection Measures	Design and Engineering	Construction	Operations and Maintenance	Federal Land and all Land in Wyoming and Idaho Segments 6, 8, and 9	State Land in Idaho	Private Land in Idaho Segments 4, 5, 7, and 10
OM-13	Any chemical control will be done in accordance with any applicable local, state, and federal rules and regulations. Pesticides or other chemical control will be selected from the BLM and USFS lists of previously approved pesticides and in accordance with any pesticide plans. If the federal land managing agency determines that a previously approved pesticide and/or plan is unacceptable, they shall notify the Companies.			•	•	•	•
OM-14	Before beginning an O&M project on federal or state land, the Companies or their subcontractors will clean all equipment that will operate off-road or disturb the ground. Tracks, skid plates, and other parts that can trap soil and debris will be removed for cleaning when feasible, and the entire vehicle and equipment will be cleaned at an off-site location.			•	•	•	•
OM-15	To help limit the spread and establishment of noxious weed species in disturbed areas, desired vegetation needs to be established promptly after disturbance. The Companies will rehabilitate significantly disturbed areas as soon as possible after ground-disturbing activities and during the optimal period. Seed and mulch will be certified “noxious weed free” and seed mix will be agreed to in advance by the landowner or land managing agency.			•	•	•	•
OM-16	Routine and corrective O&M activities in streams with sensitive fish species will occur from July 1 to September 1 in an effort to minimize impact to spawning and migration activities. These activities include, but are not limited to, culvert installation and/or replacement and stream bank stabilization. Fording streams at existing crossings on existing roads (e.g., dip, culvert, bridge) will occur as necessary throughout the year.			•	•	•	•
OM-17	Woody vegetation management within 50 feet of streams will be conducted by hand crews.			•	•	•	•
OM-18	Herbaceous plants and low-growing shrubs will be left in place if they do not interfere with the safe O&M of Project lines and equipment as described in Appendix R of the Plan of Development.			•	•	•	•
OM-19	The Companies will use existing stream crossings or new, permanent crossings that were approved as part of the Project, and will not create additional crossings without prior agency permitting and approval.			•	•	•	•
OM-20	Only pesticides approved by the land managing agency as safe to use in aquatic environments and reviewed by the Companies for effectiveness will be used within 100 feet of sensitive aquatic resources or in areas with a high leaching potential.			•	•		
OM-21	Prior to the start of O&M activities, all supervisory personnel will be instructed on the protection of natural resources, including sensitive plant and wildlife species and habitats. If a contractor is used, the construction contract will address (a) the sensitive plant species that may be present in a particular area based on previous surveys			•	•	•	•

Table 4-1. Environmental Protection Measures for Segments 1, 2, 3, and 3A

GATEWAY WEST TRANSMISSION LINE PROJECT

1	2	3-5			6-8		
		Application Phase			Applicable to Land Ownership		
EPM Number	Environmental Protection Measures	Design and Engineering	Construction	Operations and Maintenance	Federal Land and all Land in Wyoming and Idaho Segments 6, 8, and 9	State Land in Idaho	Private Land in Idaho Segments 4, 5, 7, and 10
	and literature review; (b) the federal and state laws regarding protection of plants and wildlife; (c) the importance of these resources; (d) the purpose and necessity of protecting them; and (e) methods for protecting sensitive resources (e.g., Endangered Species Act, Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, and BLM wildlife policy).						
OM-22	Sensitive plant populations that occur within or near the ROW and work areas will be marked on the ground, where practical, to ensure that they are avoided. If species are discovered during the work, the Companies will establish a spatial buffer zone, will contact the appropriate Agency within 24 hours, and will continue with the O&M activities outside of the established buffer unless otherwise directed. The Agency may evaluate the adequacy of the buffer on a case-by-case basis. Unless the Companies are informed otherwise, work outside of the buffer area will continue. If the Companies need to work within the buffer area, the Agencies and Companies will work together to develop a solution that is acceptable to both parties and will allow for the Companies to complete the work in a timely manner or within the scheduled outage window, if applicable. After the O&M activities are completed, or will no longer poses a threat to the plant population, the marking (stakes), if used, will be promptly removed to protect the site's significance and location from unwanted attention. As needed, marking will be reinstated during the land rehabilitation period.			•	•		

Table 4-1. Environmental Protection Measures for Segments 1, 2, 3, and 3A

GATEWAY WEST TRANSMISSION LINE PROJECT

1	2	3-5			6-8		
		Application Phase			Applicable to Land Ownership		
EPM Number	Environmental Protection Measures	Design and Engineering	Construction	Operations and Maintenance	Federal Land and all Land in Wyoming and Idaho Segments 6, 8, and 9	State Land in Idaho	Private Land in Idaho Segments 4, 5, 7, and 10
OM-23	If sensitive wildlife species are discovered during O&M activities, and the animals are not directly within ground disturbance areas, they will be protected by marking the edges of the ROW and new access roads in the general vicinity to ensure that workers do not leave those areas. If the animals are within work areas that have, or will have, ground disturbance, the Companies will establish an appropriate buffer zone and will contact the federal or state land manager immediately. The federal or state agency may evaluate the adequacy of the buffer on a case-by-case basis. Unless the Companies are informed otherwise, work outside of the buffer area will continue. If the Companies need to work within the buffer area, the Agencies and Companies will work together to develop a solution that is acceptable to both parties and will allow for the Companies to complete the work in a timely manner or within the scheduled outage window, if applicable. After the O&M activities are completed, or will no longer pose a threat to the species, the marking (stakes) will promptly be removed to protect the site's significance and location from unwanted attention. As needed, marking will be reinstated during the land rehabilitation period.			•	•	•	•
OM-24	The Companies will provide crews and contractors with maps showing environmentally sensitive areas; these maps will include work zones as well as ROW areas where ground disturbance will be avoided.			•	•	•	•
OM-25	In the event any sensitive plants require relocation, permission will be obtained from the federal agency. If avoidance or relocation is not practical, the topsoil surrounding the plants will be salvaged, stored separately from subsoil, and respread during the restoration process.			•	•		
OM-26	If sensitive wildlife species are killed or injured due to O&M activities, the appropriate federal agency will be notified.			•	•		
OM-27	All on-site personnel will be made aware that all birds of prey are protected by federal and state laws.			•	•	•	•
VISUAL							
VIS-1	The 500-kV transmission line lattice steel towers will be specified to have a dull galvanized finish. The proposed surface finish is a galvanized finish, treated after the initial galvanizing process to produce a dulled finish to reduce surface reflectivity. This process results in an installed tower with more visual absorption and thus allows the towers to blend in better with the landscape.	•			•	•	•
VIS-2	The three subconductors (500-kV) and two subconductors (230-kV) that make up the conductor bundles will be specified to have a non–specular finish. Similar to the dulled finish of the transmission structures, the conductors reduce surface reflectivity. This process results in eliminating the shiny ribbon effect often seen in older	•			•	•	•

Table 4-1. Environmental Protection Measures for Segments 1, 2, 3, and 3A

GATEWAY WEST TRANSMISSION LINE PROJECT

1	2	3-5			6-8		
		Application Phase			Applicable to Land Ownership		
EPM Number	Environmental Protection Measures	Design and Engineering	Construction	Operations and Maintenance	Federal Land and all Land in Wyoming and Idaho Segments 6, 8, and 9	State Land in Idaho	Private Land in Idaho Segments 4, 5, 7, and 10
	untreated transmission lines and thus allows the conductors to blend in better with the landscape.						
VIS-3	The proposed 230-kV transmission lines between Windstar and Aeolus will use a steel H-frame structure configuration similar to the existing 230-kV line in the same general location. The steel pole H-frame will utilize self-weathering steel. Self-weathering steel is manufactured from a group of steel alloys that were developed to eliminate the need for painting. This type of steel alloy forms a stable rust-like appearance if exposed to the weather for several years. In areas where the 230-kV structures are skylined, dull galvanized steel will be considered to minimize visual impacts. Dulled galvanized steel has a galvanized finish, treated after the initial galvanizing process to produce a dulled finish to reduce surface reflectivity. This process results in an installed tower with more visual absorption and thus allows the towers to blend in better with the terrain, while at the same time preserving the corrosion resistant properties of the galvanized coating on the steel.	•			•	•	•
VIS-4	No paint or permanent discoloring agents will be applied to rocks or vegetation to indicate limits of survey or construction activity except as required under the timber sale contracts.		•		•	•	•
VIS-5	To minimize ground disturbance and/or reduce scarring (visual contrast) of the landscape, the alignment of any new access roads or cross-country routes will follow the landform contours where practicable, providing that such alignment does not impact resource values additionally or result in new impacts to resources that were previously avoided.	•	•		•	•	•
VIS-6	To minimize sensitive feature disturbance and/or visual contrast in designated areas on federal lands, structures will be placed so as to avoid sensitive features such as, but not limited to, riparian areas, water courses and cultural sites and/or to allow conductors to clearly span the features, within the limits of standard tower design. Where conflicts arise between resources, the applicable land manager will be consulted.	•	•		•		
VIS-7	To reduce visual impacts on federal land, including potential impacts on recreation values and safety, towers will be placed at the maximum feasible distance from the highway, canyon and trail crossings within limits of standard design and to the extent practical.	•	•		•		
VIS-8	Crossings of rivers shall be at approximately right angles where practical. Strategic placement of structures will be done both as a means to screen views of the transmission line and ROW and to minimize the need for vegetative clearing.	•	•		•	•	•
VIS-9	Insulators will be made of materials that have reduced potential to reflect and refract light. Glass insulators that are highly reflective will not be permitted in scenic areas on federally managed lands.	•	•		•		

Table 4-1. Environmental Protection Measures for Segments 1, 2, 3, and 3A

GATEWAY WEST TRANSMISSION LINE PROJECT

1	2	3-5			6-8		
		Application Phase			Applicable to Land Ownership		
EPM Number	Environmental Protection Measures	Design and Engineering	Construction	Operations and Maintenance	Federal Land and all Land in Wyoming and Idaho Segments 6, 8, and 9	State Land in Idaho	Private Land in Idaho Segments 4, 5, 7, and 10
VIS-10	For segments of the line 1) within the 0- to 0.5-mile zone of Interstate highways where existing lines of the same voltage are paralleled and 2) within the 0- to 0.5-mile zone of residences where existing lines of the same voltage are paralleled, new towers will be located adjacent to existing towers, within the limits of standard transmission line design and considering the ruling span length of adjacent proposed and existing lines.	•	•		•	•	•
VIS-11	Site-specific "micrositing," within the limits of standard engineering design, will be required near certain sensitive areas, as identified by the agencies, where proposed transmission facilities will impact visual quality; these situations include: • Crossings over major highways; • Crossings of high quality historic trails; • Crossings over the North Platte and Snake Rivers; • Sensitive travelways, use areas, residential areas, recreational facilities as identified by the agencies (including national recreation and scenic trails, campgrounds, recreation areas, and trailheads), and other areas identified by management plans; and • To avoid bisecting forest patches within the Sawtooth NF. The Companies will consult with the applicable local land management agency during transmission line design.	•	•		•		
VIS-12	The lighting specified for the marshaling yards will be the minimum required to meet safety and security standards. All light fixtures within 1,000 feet of a residence will be hooded to eliminate any potential for glare and to prevent light from spilling off the site or up into the sky. Additionally, the fixtures will have sensors and switches to permit the lighting to be turned off at times when it is not required.		•		•	•	•
VIS-13	To reduce visual contrast in areas where overstory vegetation is removed for access, tower pads, or conductor clearance, specific sections of the ROW on federal land will have uneven edges (trees will be removed from the edge of the ROW out or away from the ROW boundary) to give a natural appearance, where not in conflict with regulatory requirements (e.g., NERC, WECC, and Occupational Safety and Health Administration requirements). This will be a onetime application (not applicable to operations and maintenance) and conducted with agency approval.	•	•		•		

Table 4-1. Environmental Protection Measures for Segments 1, 2, 3, and 3A

GATEWAY WEST TRANSMISSION LINE PROJECT

1	2	3-5			6-8		
		Application Phase			Applicable to Land Ownership		
EPM Number	Environmental Protection Measures	Design and Engineering	Construction	Operations and Maintenance	Federal Land and all Land in Wyoming and Idaho Segments 6, 8, and 9	State Land in Idaho	Private Land in Idaho Segments 4, 5, 7, and 10
VIS-14	To mitigate potential visual impacts on federal land, the construction and maintenance plan, to be developed by the Companies, will include measures to reduce ROW scarring and enhance restoration. The plan will be approved by the land management agency prior to ground clearing and construction.	•		•	•		
CULTURAL							
CR-1	All work conducted in accordance with the Historic Properties Treatment Plan (HPTP) will be performed by qualified archeologists with trained assistants.		•		•	•	•
CR-2	An Inadvertent Discovery Plan will be included as part of the HPTP. This plan will specify what steps will be taken if a subsurface cultural resource is discovered during construction, including stopping construction in the vicinity of the find, notification of the appropriate land management agency, identification of a qualified archaeologist to conduct an evaluation of the find, and the development of an approved data recovery program or other mitigation measures.		•		•	•	•
CR-3	The Cultural Resources Protection Plan will include provisions for the preparation and curation of artifacts from federal lands and for the preparation of a final report based on the data recovered for activities on federal lands.		•		•		
CR-4	Literature reviews and Class III surveys will be completed for cultural resources. A literature review will be conducted on public and private lands and will cover a study area of one-half mile on either side of the proposed and alternate transmission line alignments as well as areas identified for use as multi-purpose areas and access roads. Class III surveys covering the Area of Potential Effect (APE) as specified in the Programmatic Agreement will be completed. A Class II Sample Survey was conducted that consisted of an intensive pedestrian survey of 15 percent of the length of all alternatives. One-mile long by 500-foot wide transect strips were surveyed along proposed and alternative routes on federal lands only, for use in detailed analysis in the EIS. This also included a detailed preliminary assessment of effects on historic trails on all lands within the APE, including existing trail condition and a visual effects assessment.	•			•	•	•
CR-5	If construction will adversely affect any properties listed on, or eligible for listing on, the National Register of Historic Places (NRHP), mitigation will be required. Mitigation will be in accordance with the HPTP and may include, but not be limited to, one or more of the following measures: a) avoidance through the use of relocation of structures through the design process, realignment of the route, relocation of temporary workspace, or changes in the construction and/or operational design; b) the use of landscaping or other techniques that will minimize or eliminate		•		•	•	•

Table 4-1. Environmental Protection Measures for Segments 1, 2, 3, and 3A

GATEWAY WEST TRANSMISSION LINE PROJECT

1	2	3-5			6-8		
		Application Phase			Applicable to Land Ownership		
EPM Number	Environmental Protection Measures	Design and Engineering	Construction	Operations and Maintenance	Federal Land and all Land in Wyoming and Idaho Segments 6, 8, and 9	State Land in Idaho	Private Land in Idaho Segments 4, 5, 7, and 10
	effects on the historic setting or ambience of standing structures; and c) data recovery, which may include the systematic professional excavation of an archaeological site or the preparation of photographic and/or measured drawings documenting standing structures.						
CR-6	Avoidance areas will be flagged or otherwise marked prior to construction activities. Flagging or other marking will be removed once construction is completed in an area.		•		•	•	•
CR-7	To minimize unauthorized collecting of archaeological material or vandalism to known archaeological sites, all workers will attend mandatory training on the significance of cultural resources and the relevant federal regulations intended to protect these resources.		•		•	•	•
CR-8	If human remains are discovered, construction will be halted and the coroner will be notified and measures specified in the HPTP will be followed.		•		•	•	•
RECLAMATION							
WEED 1 – 3, and 6 – 18	(Described under Weeds)						
WQA 32, 34, and 35	(Described under Water Quality)						
REC-1	The Companies' personnel and their contractor will be trained on noxious and invasive weed identification to facilitate avoidance of infestations where possible or identification of new infestations.			•	•	•	•
REC-2	Preconstruction weed treatment will be conducted prior to the start of ground-disturbing activities and at the time most appropriate for the target species.		•		•	•	•
REC-3	Preconstruction weed treatment will be limited to the areas that are expected to have surface-disturbing activities. The Final Reclamation Plan will include a schedule showing the phased in-service dates for different segments. Preconstruction weed treatment will be scheduled accordingly.		•		•	•	•
REC-4	Preconstruction treatment may use mechanical control, hand spraying, grazing, or pesticides. The Final Reclamation Plan will discuss those options, as applicable.		•		•	•	•
REC-5	All pesticide applications will comply with label restrictions, federal, state and/or county regulation, the Companies' specifications and landowner agreements. No spraying will occur prior to notification of the applicable land management agency. On federal or state controlled lands, a pesticide use plan will be submitted prior to any pesticide application as recommended in the BLM herbicide EIS (http://www.blm.gov/wo/st/en/prog/more/veg_eis.html). The pesticide use plan will include the dates and locations of application, target species, pesticide, adjuvants, and application rates and methods (e.g.,		•		•	•	•

Table 4-1. Environmental Protection Measures for Segments 1, 2, 3, and 3A

GATEWAY WEST TRANSMISSION LINE PROJECT

1	2	3-5			6-8		
		Application Phase			Applicable to Land Ownership		
EPM Number	Environmental Protection Measures	Design and Engineering	Construction	Operations and Maintenance	Federal Land and all Land in Wyoming and Idaho Segments 6, 8, and 9	State Land in Idaho	Private Land in Idaho Segments 4, 5, 7, and 10
	spot spray vs. boom spray). No pesticide will be applied to any private property without written approval of the landowner. The Final Reclamation Plan will contain a list of pesticides that may be used, target species, best time for application, application rates, and if they are approved for use on BLM-managed and NFS lands.						
REC-6	Pesticides may be applied using a broadcast applicator mounted on a truck or all-terrain vehicle (ATV), backpack sprayers, or with hand sprayers as conditions dictate. Pesticide applications will be conducted only by licensed operators or under the supervision of a licensed operator. Vehicle-mounted sprayers (e.g., handgun, boom, and injector) may be used in open areas readily accessible by vehicle. Where allowed, a broadcast applicator will likely be used. In areas where noxious weeds are more isolated and interspersed with desirable vegetation, noxious and invasive weeds will be targeted by hand application methods (e.g., backpack spraying), thereby avoiding other plants. Preconstruction pesticide applications will not occur within 100 feet of known special status species. Calibration checks of equipment will be conducted at the beginning and periodically during spraying to ensure proper application rates are achieved.		•		•	•	•
REC-7	All areas treated will be documented using GPS technologies and included in the annual report.			•	•	•	•
REC-8	Areas of existing noxious weeds and invasive species will be avoided where possible to reduce the risk of spread.		•	•	•	•	•
REC-9	Project vehicles will arrive at the job site clean of all soil and herbaceous material. The Construction Contractor will ensure vehicles and equipment are free of soil and debris capable of transporting noxious weed seeds, roots, or rhizomes before the vehicles and equipment access the Project. The CIC will inspect vehicles to ensure compliance.		•	•	•	•	•
REC-10	When the Construction Contractor demobilizes from the job site where identified infestations of noxious weeds are present, they will use appropriate decontamination measures as defined in the Final Reclamation Plan.		•	•	•	•	•
REC-11	Soil stockpiles from areas that did not have noxious weeds or invasive species present, will not be placed adjacent to populations of noxious weeds or invasive species, where practicable.		•		•	•	•
REC-12	Areas disturbed by Project activities are susceptible to the establishment and spread of noxious weeds. Erosion control measures identified in the SWPPP(s) will also assist in preventing the establishment of weeds on exposed soils.		•		•	•	•
REC-13	Project-related storage and multi-purpose areas, fly yards, and other areas that are subject to regular long-term disturbance will be kept weed-free through regular site inspections and pesticide applications, subject to the consent of the landowner.		•		•	•	•

Table 4-1. Environmental Protection Measures for Segments 1, 2, 3, and 3A

GATEWAY WEST TRANSMISSION LINE PROJECT

1	2	3-5			6-8		
		Application Phase			Applicable to Land Ownership		
EPM Number	Environmental Protection Measures	Design and Engineering	Construction	Operations and Maintenance	Federal Land and all Land in Wyoming and Idaho Segments 6, 8, and 9	State Land in Idaho	Private Land in Idaho Segments 4, 5, 7, and 10
REC-14	Where preconstruction surveys have identified noxious or invasive weed species infestations, topsoil and other soils will be placed next to the infested area and clearly identified as coming from an infested area. Movement of stockpiled vegetation and salvaged topsoil will be limited to eliminate the transport of soil-borne noxious weed seeds, roots, or rhizomes, and marked as containing noxious seed materials to avoid mixing with weed-free soil. Topsoil will be returned to the area it was taken from and will not be spread in adjacent areas. If the topsoil is not suitable for backfill, then it will be spread in another previously disturbed area and clearly identified for future weed treatments as applicable. As directed by the BLM or USFS, the Construction Contractor may be required to provide additional treatments (i.e., pre-emergent pesticides) to prevent return of noxious weeds.		•		•	•	•
REC-15	Straw or hay that may be used as a BMP to control erosion and sedimentation must be certified weed free. If certified weed-free materials are not available, then alternative BMPs will be used. The use of alternative BMPs will be coordinated with the construction storm water inspector.		•		•	•	•
REC-16	The topsoil layer will be removed, taking care not to mix it with the underlying sub-soil. Where topsoil separation is employed, topsoil will be stored in a separate stockpile.		•		•	•	•
REC-17	Certified weed-free straw, mulch, gravel, and other BMPs as appropriate, will be used as described in the SWPPP to stabilize the stockpile and limit erosion and standing water, control dust, and control the establishment of noxious or invasive weeds in stockpiled soils.		•		•	•	•
REC-18	Topsoil and sub-surface soils will be replaced in the proper order during reclamation.		•		•	•	•
REC-19	Where it is necessary to spread soils (subsurface soils or waste rock resulting from excavations or foundation drilling), it will be done where practicable and in close proximity to where the disturbance occurred (within the ROW). Material will be spread uniformly to match existing contours, covered with topsoil when available, and reseeded.		•		•	•	•

Table 4-1. Environmental Protection Measures for Segments 1, 2, 3, and 3A

GATEWAY WEST TRANSMISSION LINE PROJECT

1	2	3-5			6-8		
		Application Phase			Applicable to Land Ownership		
EPM Number	Environmental Protection Measures	Design and Engineering	Construction	Operations and Maintenance	Federal Land and all Land in Wyoming and Idaho Segments 6, 8, and 9	State Land in Idaho	Private Land in Idaho Segments 4, 5, 7, and 10
REC-20	Temporarily disturbed lands within the ROW will be recontoured to blend with the surrounding landscape. Recontouring will emphasize restoration of the existing drainage patterns and landform to preconstruction conditions, to the extent practicable. (Tower pads will not be recontoured.)		•		•	•	•
REC-21	De-compaction: Areas within the ROW, laydown or multi-purpose areas, and other areas of extensive vehicle travel will typically contain compacted soils. These soils will be de-compacted on a case-by-case basis through negotiation with the landowner or land management agency.		•		•	•	•
REC-22	Final Cleanup: Final cleanup will ensure that all construction areas are free of any construction debris including, but not limited to: assembly scrap metals, oil or other petroleum-based liquids, construction wood debris, and worker-generated litter. Permanent erosion control devices will be left in place.		•		•	•	•
REC-23	The Companies will utilize soil amendments (e.g., fertilizer, wood or straw mulches, tackifying agents, or soil stabilizing emulsions) on a case-by-case basis and with landowner or land management agency approval. Specific soil amendments will be identified in the Final Reclamation Plan and be consistent with the SWPPPs.		•		•	•	•
REC-24	Broadcast seeding will apply the seed directly on the ground surface. The type of broadcast spreader will depend on the size of the area to be seeded, and the terrain. Seed will be placed in direct contact with the soil, ideally at a depth of approximately 0.5 to 1-inch deep. It will then be covered by raking or dragging a chain or harrow over the seed bed to remove air pockets.		•		•	•	•
REC-25	Drill seeding will be used on areas of sufficient size with moderate or favorable terrain to accommodate mechanical equipment. Drill seeding provides the advantage of planting the seed at a uniform depth.		•		•	•	•
REC-26	Hydroseeding, which is the spraying of seeds and water onto the ground surface, or hydroseeding/hydromulching, which is the spraying of seeds, mulch and water, may be implemented on steeper slopes. Tackifier may be added to facilitate adherence of hydromulch to slopes greater than 25 percent.		•		•	•	•
REC-27	Reclamation treatments, such as seeding, will be based on site-specific conditions and the appropriate seed mix approved for those conditions. Seeding will help to reduce the spread of noxious weeds by revegetating exposed soils.		•		•	•	•
REC-28	If areas are not immediately seeded after construction, due to weather or scheduling constraints, all noxious weeds will be eradicated before seeding, preferably in the spring.		•		•	•	•
REC-29	Upon completion of construction, 70 percent of the disturbed area along the transmission line within the ROW, at substations, and at		•		•	•	•

Table 4-1. Environmental Protection Measures for Segments 1, 2, 3, and 3A

GATEWAY WEST TRANSMISSION LINE PROJECT

1	2	3-5			6-8		
		Application Phase			Applicable to Land Ownership		
EPM Number	Environmental Protection Measures	Design and Engineering	Construction	Operations and Maintenance	Federal Land and all Land in Wyoming and Idaho Segments 6, 8, and 9	State Land in Idaho	Private Land in Idaho Segments 4, 5, 7, and 10
	related facilities will be revegetated with approved vegetation (refer to Appendix D – Framework Reclamation Plan).						
VEGETATION							
REC-2–17, 23–29	(Described under Reclamation)						
WEED-6, 7, and 11	(Described under Weeds)						
VEG-1	During construction, blading of native plant communities will be minimized, consistent with safe construction practices. Where feasible, shrubs will be cut at or near ground level to facilitate re-growth after construction. The footprint of construction and operations facilities will be kept to the minimum necessary. Blading near watercourses will be minimized and BMPs identified in the SWPPPs will be implemented to reduce the risk of materials entering watercourses.		•		•	•	•
VEG-2	Where feasible, locate new access roads to minimize the number of trees removed during construction. However, new access roads will not be relocated if the change would result in an increase in the overall disturbance (acres); require additional cut and fill activities, or impact other sensitive resources (e.g., sagebrush plant community, sensitive species habitat, and/or cultural resources or viewshed).	•			•		
VEG-3	In areas where revegetation will be completed, topsoil salvage and replacement will be used for all cut or fill areas and for areas larger than 1 acre where soils will be disturbed during construction.		•		•	•	•
VEG-4	Prior to the start of construction and maintenance activities, all contractor vehicles and equipment (including personal protective equipment) will be cleaned of soil and debris capable of transporting invasive plant seeds or other propagules. All vehicles and equipment will be inspected by Agency-approved inspectors and certified as weed free by agency approved personnel, in order to ensure they have been cleaned properly. The Construction Contractor will identify the location of all cleaning stations, how materials cleaned from vehicles at these stations will be either captured or treated so that cleaning station locations will not become infected, and who will confirm/certify that vehicles leaving cleaning stations and/or entering construction sites are free of invasive plant materials in the Final Reclamation and Noxious Weed Plans.		•	•	•	•	•
VEG-5	The Agency-approved Environmental CIC will approve primary noxious weed-free straw or other erosion control materials on federally managed lands prior to application.		•		•		
VEG-6	The Companies will consult with the appropriate land management agency to determine tree seedlings to be planted in decommissioned roadbeds and other temporarily disturbed areas			•	•		

Table 4-1. Environmental Protection Measures for Segments 1, 2, 3, and 3A

GATEWAY WEST TRANSMISSION LINE PROJECT

1	2	3-5			6-8		
		Application Phase			Applicable to Land Ownership		
EPM Number	Environmental Protection Measures	Design and Engineering	Construction	Operations and Maintenance	Federal Land and all Land in Wyoming and Idaho Segments 6, 8, and 9	State Land in Idaho	Private Land in Idaho Segments 4, 5, 7, and 10
	on federally managed lands (where trees were removed) to assure seedlings are matched to site conditions.						
VEG-8	Annual post-construction monitoring and treatment of invasive plants on closed roads (access roads dedicated for use by the Companies only), temporary roads, fly yards, and other disturbed areas in the ROW shall continue for 3 years in areas where infestations or populations of noxious weeds have been identified. If after 3 years, post-construction conditions are not equivalent to or better than preconstruction conditions (in accordance with applicable permit), monitoring and treatment will continue until these conditions are met. If adjacent land uses are contributing to the introduction and/or persistence of invasive plant species within areas disturbed by the Project, then the Companies will not be required to treat noxious weeds for more than 3 years.			•	•		
VEG-10	All timber and other vegetative resources to be sold or removed from federal lands will be appraised and sold at the appraised value. Note that this is an agency imposed measure.		•		Federal land only		
TES-PLANTS							
OM-21–22 and 24–25	(Described under Operations and Maintenance.)						
TESPL-1	Blowout Penstemon – Surface disturbance will be allowed in suitable habitat where species-specific surveys have determined that no populations are present. The species-specific surveys will be conducted the year prior to construction, and the proposed disturbance areas will be redesigned to avoid direct impact to populations.		•		•		
TESPL-2	Colorado Butterfly Plant – Surface disturbance will be allowed in suitable habitat where species-specific surveys have determined that no populations are present. The species-specific surveys will be conducted the year prior to construction, and the proposed disturbance areas will be redesigned to avoid direct impact to populations.		•		•		
TESPL-3	Qualified botanists shall conduct preconstruction surveys during a season when target species are readily identifiable for special status or globally rare species. Where feasible, micrositing of Project facilities shall avoid direct impacts to identified populations. Survey reports documenting the surveys, their results, and recommendations must be provided to the applicable land management agencies for approval prior to construction. Agency botanists may evaluate individual sites based on site-specific conditions. Documentation of the evaluation of avoidance of impacts to sensitive and globally rare plants must be provided to the Agencies prior to construction.	•			•		
TESPL-5	Sand dune and cushion plant communities will be avoided, where feasible.	•	•		•		

Table 4-1. Environmental Protection Measures for Segments 1, 2, 3, and 3A

GATEWAY WEST TRANSMISSION LINE PROJECT

1	2	3-5			6-8		
		Application Phase			Applicable to Land Ownership		
EPM Number	Environmental Protection Measures	Design and Engineering	Construction	Operations and Maintenance	Federal Land and all Land in Wyoming and Idaho Segments 6, 8, and 9	State Land in Idaho	Private Land in Idaho Segments 4, 5, 7, and 10
TESPL-7	Ute Ladies'-tresses – Qualified botanists shall conduct preconstruction surveys during a season when target species are readily identifiable for special status or globally rare species. Where feasible, micrositing of project facilities shall avoid direct impacts to identified populations. Survey reports documenting the surveys, their results, and recommendations must be provided to the applicable land management agencies for approval prior to construction. Agency botanists may evaluate individual sites based on site-specific conditions. Documentation of the evaluation of avoidance of impacts to sensitive and globally rare plants must be provided to the Agencies prior to construction.	•			•	•	•
WEEDS							
REC-2–15, 17	(Described under Reclamation)						
OM-13–15 and 20	(Described under Operations and Maintenance)						
VEG-4 and 8	(Described under Vegetation)						
FISH-3	(Described under Fish)						
SOIL-11 and 12	(Described under Soils)						
WEED-1	The Companies shall consult with each appropriate local land management agency (USFS and BLM) office to determine appropriate seed mix and commercial seed source for revegetation. The Final Reclamation Plan shall specify the approved seed mixes for federal lands. Disturbed soil will not be allowed to support the growth of noxious weeds or invasive weedy species. Prevention of noxious weeds will apply to all phases of the Project.	•	•		•	•	
WEED-2	Weed control and prevention measures shall adhere to all agency standards and guidelines. These measures shall be developed in consultation with local, state, and federal weed agencies; all implemented measures will follow the principle of integrated weed management.		•		•	•	•
WEED-3	Soil stockpiles in areas containing noxious weeds and invasive plant species shall be kept separate from soil removed from areas that are free of noxious weed and invasive plant species, and the soil will be replaced in or near the original excavation. If requested by the applicable land management agency, soil stockpiles shall be covered with plastic if the soil stockpile will be in place for two weeks or more and is not being actively used. On lands managed by the USFS or per private landowner request, stockpiles will not be covered with plastic.		•		•		
WEED-4	Gravel and other materials used for road construction on federally managed lands shall come from certified weed-free sources.		•		Federal land only		

Table 4-1. Environmental Protection Measures for Segments 1, 2, 3, and 3A

GATEWAY WEST TRANSMISSION LINE PROJECT

1	2	3-5			6-8		
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WEED-5	Where feasible, construction will begin in weed-free areas before operating in weed-infested areas. The feasibility of this measure will be determined after survey data is completed to identify weed-free and weed-infested areas.		•		•	•	•
WEED-6	All movement of construction vehicles outside of the ROW will be restricted to pre-designated access, contractor-acquired access, or public roads. All construction sites and access roads, including overland access routes, will be clearly marked or flagged at the outer limits prior to the onset of any surface-disturbing activity. All personnel shall be informed their activities must be confined within the marked or flagged areas.		•		•	•	•
WEED-7	Prior to arrival at the work site, all Construction Contractor vehicles and equipment will be cleaned using high-pressure air or water equipment. The cleaning activities will concentrate on tracks, feet, or tires and the undercarriage with special emphasis on axles, frame, cross members, motor mounts, underneath steps, running boards, and front bumper/brush guard assemblies. Vehicle cabs will be swept out. The locations of vehicle cleaning stations will be identified by the Construction Contractor. Additional wash stations will be required as identified by the BLM, USFS, and CIC. Wash stations shall be no more than one acre in size and preferably located in areas that have previously been disturbed. The Construction Contractor shall provide a detailed design identifying all of the components of the wash stations, including rock surface and geomembrane layer to provide a barrier between noxious weeds and seeds and the soil for approval by the BLM or USFS Authorized Officer or his/her designated representative. The Construction Contractor shall also provide a description of how residue from the wash station will be disposed of for approval by the BLM, BOR, or USFS Authorized Officer or his/her designated representative.		•		•	•	•
WEED-8	When moving from weed contaminated areas to other areas along the transmission line ROW, all construction vehicles and equipment will be cleaned using compressed water or air in designated wash stations before proceeding to new locations. All washing of construction vehicles and equipment must be performed in approved wash stations.		•		•	•	•
WEED-9	Construction personnel will inspect, remove, and appropriately dispose of weed seed and plant parts found on their clothing and equipment.		•		•	•	•
WEED-10	Immediately following construction, the Construction Contractor will implement the reclamation of disturbed land as outlined in Appendix D – Framework Reclamation Plan as required. Continuing revegetation efforts will ensure adequate vegetative cover, reducing the potential for the invasion of noxious weeds.		•		•	•	•

Table 4-1. Environmental Protection Measures for Segments 1, 2, 3, and 3A

GATEWAY WEST TRANSMISSION LINE PROJECT

1	2	3-5			6-8		
		Application Phase			Applicable to Land Ownership		
EPM Number	Environmental Protection Measures	Design and Engineering	Construction	Operations and Maintenance	Federal Land and all Land in Wyoming and Idaho Segments 6, 8, and 9	State Land in Idaho	Private Land in Idaho Segments 4, 5, 7, and 10
WEED-11	Discing or other mechanical treatments that would disturb the soil surface within native habitats will be avoided in favor of pesticide application, which is an effective means of reducing the size of noxious weed populations, as well as preventing the establishment of new colonies.		•		•	•	•
WEED-12	Implement preventive measures, such as quarantine and closure, to reduce and contain existing noxious weed populations. Flagging will alert personnel and prevent access into areas where noxious weeds occur. Construction disturbance will be minimized in these areas until control measures have been implemented (with the exception of reclamation treatments, as applicable).		•		•	•	•
WEED-13	If discing or tilling is an appropriate and feasible weed treatment method, it will only be permitted in bladed areas.		•		•	•	•
WEED-14	Seed selection will be based on site-specific conditions, and the appropriate seed mix will be identified for those conditions based on the presence and treatment of noxious weeds in the Project area. The CIC or weed specialist may recommend modified seeding application rates and timing of implementation to achieve site-specific weed management objectives.		•		•	•	•
WEED-15	Additional weed and/or erosion control measures recommended during monitoring will follow the preventive and control measures outlined in the Noxious Weed Plan. Continued cooperation with the current BLM, BOR, or USFS noxious weed coordinator and local weed management areas is also encouraged.		•		•	•	•
WEED-16	A certified pesticide applicator, approved in the states of Wyoming or Idaho, will perform the application using pesticides selected and approved by BLM or USFS in accordance with applicable laws, regulations, and permit stipulations. All pesticide applications must follow U.S. Environmental Protection Agency label instructions. Application of pesticides will be suspended in accordance with the Companies' vegetation management specifications (e.g., strong winds, etc.).		•		•	•	•
WEED-17	Pesticides will be transported to the Project site daily with the following provisions: • Only the quantity needed for that day's work will be transported. • Concentrate will be transported only in approved containers in a manner that will prevent tipping or spilling, and in a location isolated from the vehicle's driving compartment, food, clothing, and safety equipment. • Mixing will be done offsite, over a drip catching device and at the following distances from open or flowing water, wetlands, or other sensitive resources: 100 feet for practically non-toxic to slightly toxic pesticides; 250 feet for moderately toxic or		•		•	•	•

Table 4-1. Environmental Protection Measures for Segments 1, 2, 3, and 3A

GATEWAY WEST TRANSMISSION LINE PROJECT

1	2	3-5			6-8		
		Application Phase			Applicable to Land Ownership		
EPM Number	Environmental Protection Measures	Design and Engineering	Construction	Operations and Maintenance	Federal Land and all Land in Wyoming and Idaho Segments 6, 8, and 9	State Land in Idaho	Private Land in Idaho Segments 4, 5, 7, and 10
	label advisory for ground/surface water; and 250 feet for highly toxic to very highly toxic pesticides. No pesticides will be applied at these areas unless authorized by appropriate regulatory agencies. • All pesticide equipment and containers will be inspected for leaks daily. • Disposal of spent containers will be in accordance with the pesticide label.						
WEED-18	Pesticide contractors will be state-certified to apply pesticides and will obtain, and have readily available, copies of the appropriate material safety data sheets for the pesticides used. All pesticide spills will be reported in accordance with applicable laws and requirements.		•		•	•	•
STREAMS and WETLANDS							
OM- 16-20	(Described under Operations and Maintenance)						
VIS-6 and 8	(Described under Visual)						
REC-1–22, and 29	(Described under Reclamation)						
FISH-1 and 3	(Described under Fish)						
WQA-1, 2, 4 – 6, 13 – 18, 21, 23 – 29, and 45 – 48	(Described under Water Quality)						
TRANS-13, and 16 – 18	(Described under Transportation)						
WET-1	Impacts on wetland and riparian areas will be avoided unless physically or economically infeasible or where activities are permitted. Land management agencies' plans (RMPs, MFPs, and Forest Plans) that have standards, guidelines, stipulations, or avoidance buffers will be adhered to. Where these do not exist, Inland Fish Strategy (INFISH) buffers will be followed.	•			•		
WET-2	Wetland delineations will be performed prior to construction to support CWA Section 404 permitting and to minimize Project impacts. The delineation will identify both wetland and non-wetland waters of the United States that would be affected by the Project.	•			•	•	•
WET-3	Where impacts on wetlands are not avoidable, site-specific crossing plans and measures to mitigate impacts will be submitted	•			•	•	•

Table 4-1. Environmental Protection Measures for Segments 1, 2, 3, and 3A

GATEWAY WEST TRANSMISSION LINE PROJECT

1	2	3-5			6-8		
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EPM Number	Environmental Protection Measures	Design and Engineering	Construction	Operations and Maintenance	Federal Land and all Land in Wyoming and Idaho Segments 6, 8, and 9	State Land in Idaho	Private Land in Idaho Segments 4, 5, 7, and 10
	to the appropriate regulatory agency, as well as the land-managing agency. The Companies and/or Construction Contractor will obtain all necessary permits prior to discharging dredged or fill material to waters of the U.S. and state.						
WET-4	To meet USACE requirements for CWA 404 permitting, the Companies will submit a mitigation plan that is accepted by the USACE. The framework for this plan is included in the Final EIS.	•			•	•	•
WET-5	Limit construction equipment operating in streams and wetlands to that needed to clear temporary access, erect towers, pull conductor, and perform ground disturbing activities.		•		•	•	•
WET-6	Limit clearing of vegetation at the edges of a stream or wetland to the minimal area necessary for required conductor clearance and vehicle passage. Reclaim at least 70 percent of potential ground cover within 100 feet from the edges of all perennial streams, lakes, and other water bodies, or to the outer margin of the riparian ecosystem where wider than 100 feet.		•	•	•	•	•
WET-7	Salvage and respread topsoil in areas subject to temporary disturbance where grading and excavation will occur.		•		•	•	•
WET-8	Prohibit the use of imported soil, tree stumps, riprap, or brush to stabilize the construction corridor within wetlands.		•	•	•	•	•
FISH							
OM-16	(Described under Operation and Maintenance)						
BLA-2	(Described under Public Safety)						
FISH-1	On BLM-administered land, all culverts, whether temporary or permanent, must be designed to meet BLM Gold Book standards (Surface Operating Standards and Guidelines for Oil and Gas Exploration Development). On NFS lands, Forest Plan standards and guidelines shall apply.	•	•		•		
FISH-2	When taking water from TES fish-bearing streams for road and facility construction and maintenance activities, intake hoses shall be screened with the most appropriate mesh size (generally 3/32 of an inch), or as determined through coordination with NMFS and/or USFWS.		•	•	•	•	•
FISH-3	All wetlands and waters in the project area are assumed to contain aquatic invasive species and all equipment contacting water will be properly disinfected. After work is complete in a waterbody, any equipment involved in construction in that waterbody must be washed to remove any propagules of aquatic invasive species and to prevent the spread of those species to other waterbodies.		•		•	•	•
WILDLIFE							
WILD-1	Requests for exceptions from closure periods and areas will be submitted by the Companies or the Construction Contractor per the Companies' direction to the appropriate BLM Field Office in which the exception is requested through the Environmental CIC.		•	•	•		

Table 4-1. Environmental Protection Measures for Segments 1, 2, 3, and 3A

GATEWAY WEST TRANSMISSION LINE PROJECT

1	2	3-5			6-8		
		Application Phase			Applicable to Land Ownership		
EPM Number	Environmental Protection Measures	Design and Engineering	Construction	Operations and Maintenance	Federal Land and all Land in Wyoming and Idaho Segments 6, 8, and 9	State Land in Idaho	Private Land in Idaho Segments 4, 5, 7, and 10
	Established exception processes on BLM-managed lands will be followed. The agency, the CIC, or a contractor chosen by the Companies and approved by the agency, will conduct any surveys and coordinate with any other agencies as necessary. Factors considered in granting the exception include; animal conditions, climate and weather conditions, habitat conditions and availability, spatial considerations (e.g., travel routes and landscape connectivity), breeding activity levels, incubation or nestling stage, and timing, intensity, and duration of the Proposed action. Requests will be submitted in writing no more than 2 weeks prior to the proposed commencement of the construction period, to ensure that conditions during construction are consistent with those evaluated. The Authorized Officer, on a case-by-case basis, may grant exceptions to seasonal stipulations, and has the authority to cancel this exception at any time. A good faith effort will be made to act on exceptions within 5 business days of receiving a request, to allow for orderly construction mobilization. The CIC will conduct any required site visit and report the status to BLM for consideration of the decision to accept or deny the request. There is no exception process for NFS lands; all closure periods will be adhered to. Any proposed modifications to closure periods will be discussed on a case-by-case basis with the USFS.						
WILD-2	Vehicular speeds during construction and operations will be limited to 25 mph on all unsurfaced access roads. Crew and vehicle travel will be restricted to designated routes while on state designated big game winter range (except for areas within the ROW).		•	•	•		
WILD-3	The Project will be designed and constructed in compliance with Avian Power Line Interaction Committee (APLIC) guidance in order to reduce impacts to avian species. Any changes to the Project's design, as requested by federal, state, or local jurisdictions, as well as any changes considered by the Companies, will also be in compliance with APLIC guidance.	•	•	•	•	•	•
WILD-4	Preconstruction pedestrian or aerial nest surveys will be conducted in suitable habitat during the appropriate nesting time periods needed to identify new raptor nest locations, and to establish the status of previously identified raptor nests. Appropriate buffers will be applied to active nests during construction. All encounters of nesting raptors in the survey area will be reported to the biological monitor and to appropriate agencies.		•		•		
WILD-6	Guy wires will be marked with bird deterrent devices on federal lands to avoid avian collisions with structures, as directed by local land manager.	•		•	•		
WILD-7	Flight diverters will be installed and maintained where the transmission line crosses rivers at the locations identified in Appendix H, Table 4-1.. Additional locations may be identified by	•		•	•	•	•

Table 4-1. Environmental Protection Measures for Segments 1, 2, 3, and 3A

GATEWAY WEST TRANSMISSION LINE PROJECT

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	the Agencies or the Companies. The flight diverters will be installed as directed in the Companies' approved Avian Protection Plans and in conformance with the MBTA and Eagle Acts as recommended in the current APLIC collision manual.						
WILD-8	Preconstruction pedestrian or aerial surveys will be completed during appropriate nesting time periods, needed to identify each raptor species. The Companies will provide survey results to the Authorized Officer for approval. (See WILD-1)		•		•		
WILD-9	To the extent feasible, all vegetation clearing will be conducted prior to the onset of the avian breeding season (generally April 15 through July 31, depending on local conditions and federal land management plan requirements) in order to minimize impacts to migratory birds. Where this is not feasible, preconstruction surveys within the disturbance footprint shall be conducted within seven days prior to clearing. If an active nest (containing eggs or young) of a bird species protected under the MBTA is found during either preconstruction surveys or construction activities, the nest will be identified to species, inconspicuously marked, and vegetation left in place until any young have fledged.		•		•	•	•
WILD-10	Snags will be maintained along the outer portions of the Project's ROW in order to reduce the impacts to cavity nesting habitat to the extent practical and where not in conflict with the Companies' vegetation management specifications.		•		•		
WILD-11	Any areas that may require blasting will be identified and a blasting plan will be submitted to the appropriate agency for approval. Blasting within 0.25 mile of a known sensitive wildlife resource will require review and approval by the appropriate agency.		•		•		
WILD-12	The Companies will annually document the presence and location of large stick nests on any towers constructed as a result of this Project. Nests will be categorized to species or species group (raptors or ravens), to the extent possible. This will begin following the first year of construction and continue through year 10 of operations. Results will be provided annually to the applicable land management agency and to the USFWS. Note that this is an agency imposed measure.			•	Federal land only		
TES-WILDLIFE							
TESWL-1	H-frame structures will be equipped with anti-perch devices to reduce raven and raptor use, and limit predation opportunities on special status prey species on federally managed lands. Note that this is an agency imposed measure based on the Casper and Rawlins RMPs.	•	•	•	•		
TESWL-2	In the event that an ESA-listed species not covered by the Biological Opinion (BO) is discovered during surveys, construction		•	•	•	•	•

Table 4-1. Environmental Protection Measures for Segments 1, 2, 3, and 3A

GATEWAY WEST TRANSMISSION LINE PROJECT

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EPM Number	Environmental Protection Measures	Design and Engineering	Construction	Operations and Maintenance	Federal Land and all Land in Wyoming and Idaho Segments 6, 8, and 9	State Land in Idaho	Private Land in Idaho Segments 4, 5, 7, and 10
	will cease, the USFWS will be notified, and Section 7 consultation will be initiated. In addition, the transmission line or structures will be relocated to minimize direct impacts to newly discovered ESA species, to the extent practical.						
TESWL-3	Black-footed Ferret – Preconstruction surveys will be conducted for the black-tailed prairie dog (in addition to those already proposed for the white-tailed prairie dog) in Segment 1W.[1/]	•	•	•	•	•	•
TESWL-4	The Environmental CIC, an agency biologist, or agency designee will accompany the Construction Contractor site engineers during the final engineering design or prior to ground-disturbing activities to verify and flag the location of any known occupied structures (e.g., nests, burrows, colonies, dens) utilized by sensitive species. This will include, but not be limited to, artificial burrows that have been constructed as part of research/restoration efforts, prairie dog colonies, and raptor nests, which could be impacted by the Project based on the indicative engineering design. The final engineering design will be "microsited" (routed) to avoid direct impact to these occupied structures to the extent practical within engineering standards and constraints.	•			•		
TESWL-5	Grouse Species – The Companies will provide the Agencies a list of the protocols that the Companies will use during greater sage-grouse and sharp-tailed grouse preconstruction surveys. The Agencies will either approve these protocols, or suggest alternative protocols to be used.	•	•	•	•		
TESWL-6	Sharp-tailed Grouse – In areas where sharp-tailed grouse leks occur in proximity to greater sage-grouse leks, surface disturbance will be avoided within 4 miles of occupied or undetermined greater sage-grouse leks from March 1 to July 15. In areas where sharp-tailed grouse leks occur in isolation from greater sage-grouse leks, surface disturbance will be avoided within 1.2 miles of occupied or undetermined sharp-tailed grouse leks from March 15 to July 15.	•	•	•	•		
TESWL-8	Sage-Grouse – On federal lands, there will be no surface occupancy (NSO) within 0.6 mile of the perimeter (or centroid if the perimeter has not been mapped) of occupied greater sage-grouse leks located within Core areas in Wyoming, and NSO within 0.25 mile in non-Core areas (as required by BLM IM WY-2012-19 and BLM land management plans). "No surface occupancy," as used here, means no new surface facilities, including roads, will be placed within the NSO area. Other activities (i.e., non-surface occupancy) may be authorized, with the application of appropriate seasonal stipulations, provided the resource's protected area is not adversely affected.		•	•	•		
TESWL-9	Sage-Grouse – On federal lands, surface disturbance will be avoided within 4 miles of occupied or undetermined greater sage-grouse leks from March 1 to July 15. This distance (i.e., 4 miles)		•	•	•		

Table 4-1. Environmental Protection Measures for Segments 1, 2, 3, and 3A

GATEWAY WEST TRANSMISSION LINE PROJECT

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	may be reduced on a case-by-case basis by the applicable agency, if site-specific conditions will allow the Project to be located closer to the lek than 4 miles (e.g., topography prevents the Project from being visible from the lek, or a major disturbance such as a freeway or existing transmission line is located between the Project and the lek).						
TESWL-10	Sage-Grouse – If Winter Concentration Areas for the greater sage-grouse are designated, there will be no surface disturbances within the designated areas from November 1 through March 15.		•	•	•		
TESWL-11	Sage-Grouse – No structures that require guy wires will be used in occupied sagebrush obligate habitats within the area managed under the Kemmerer RMP.		•	•	•		
TESWL-12	Colorado River T&E Fishes – A payment of a one-time fee, based on a fee schedule provided by the USFWS, will be made based on the amount of water used during construction of any segments that cross the Colorado River system.		•		•	•	•
TESWL-13	Midget faded rattlesnake – Preconstruction surveys for occupied or potential midget faded rattlesnake hibernacula (i.e., rock outcrops with south to east aspect) will be conducted. The Companies shall prepare a plan identifying measures to reduce impacts to midget faded rattlesnake if they are discovered. This plan shall require approval by BLM and the WGFD prior to its implementation	•	•	•	•		
TESWL-14	For the protection of aquatic and riparian/wetland dependent species, surface disturbing and disruptive activities will be avoided in the following areas: 1) identified 100-year floodplains; 2) areas within 500 feet of perennial waters, springs, wells, and wetlands; and 3) areas within 100 feet of the inner gorge of ephemeral channels on federally managed lands. Where it is not possible to avoid wetland and riparian habitat, crossing-specific plans will be developed. These plans will: 1) demonstrate that vegetation removal is minimized; 2) show how sediment will be controlled during construction and operation within wetland and riparian areas; 3) attempt to intersect the wetland or riparian habitat at its edge; and 4) provide measures to restore habitat and ensure conservation of riparian microclimates. This plan will be submitted to the appropriate land management agency and approved prior to construction of any portion of the Project within sensitive riparian habitat. Note that this is an agency imposed measure.	•	•	•	Federal land only		
TESWL-15	Anti-perch devices will be required on power poles located within one-quarter mile of prairie dog towns within the BLM's Rawlins Field Office. Note that this is an agency imposed measure.		•		Federal land only		

Table 4-1. Environmental Protection Measures for Segments 1, 2, 3, and 3A

GATEWAY WEST TRANSMISSION LINE PROJECT

1	2	3-5			6-8		
		Application Phase			Applicable to Land Ownership		
EPM Number	Environmental Protection Measures	Design and Engineering	Construction	Operations and Maintenance	Federal Land and all Land in Wyoming and Idaho Segments 6, 8, and 9	State Land in Idaho	Private Land in Idaho Segments 4, 5, 7, and 10
TESWL-16	Sage-Grouse – If the Kemmerer RMP is amended to allow Proposed Route 4 or Alternatives 4C or 4E to be selected, existing fences within 1 mile of the portion of the Gateway West Project located on lands managed by the Kemmerer RMP will be modified with FireFly Grouse Flight diverters (or a similar product) in order to prevent greater sage-grouse mortalities. Additional site-specific reclamation, such as transplanting sagebrush seedlings within previous disturbed habitats, will also be required to off-set the net loss of sagebrush habitats within the Rock Creek/Tunp management area. Note that this is an agency imposed measure.		•	•	Federal land only		
PALEONTOLOGICAL RESOURCES							
PALEO-1	If significant fossil materials are discovered during Project construction, all surface-disturbing activities in the vicinity of the find will cease until notification to proceed is given by the Authorized Officer. The site will be protected to reduce the risk of damage to fossils and context. Appropriate measures to mitigate adverse effects to significant paleontological resources will be determined by the Authorized Officer.		•	•	•	•	•
PALEO-2	Paleontological resources (as defined by omnibus Public Land Management Act – Paleontological Resources Preservation Section) on federally managed land shall be managed and protected using scientific principles and expertise. Appropriate plans for inventory, monitoring, and the scientific and educational use of these resources shall be developed in accordance with applicable agency laws, regulations and policies.	•	•	•	•		
PALEO-3	Where fossil-bearing sediments are exposed by construction, the sediments must be covered with a 4-inch layer of soil where feasible to reduce unauthorized removal or disturbance of resources.		•	•	•	•	•
PALEO-4	To ensure compliance with the Paleontological Resources Preservation Section of the Public Land Management Act, the Companies' Paleontological Resources Protection Plan for the Project (see PALEO-2) shall specify that: • Monitoring of excavation and grading in sensitive sediments, especially access roads and tower sites, must occur when construction is near or in those geologic formations. • Monitoring of excavations in sensitive sediments, screening the excavated spoils, and processing of bulk sediment samples for microinvertebrate fossils must occur where there is a significant potential for data recovery from those spoils. Monitoring must be performed by a qualified paleontologist and in consultation with a designated paleontologist in each state, NF, or	•	•	•	Federal land only		

Table 4-1. Environmental Protection Measures for Segments 1, 2, 3, and 3A

GATEWAY WEST TRANSMISSION LINE PROJECT

1	2	3-5			6-8		
		Application Phase			Applicable to Land Ownership		
EPM Number	Environmental Protection Measures	Design and Engineering	Construction	Operations and Maintenance	Federal Land and all Land in Wyoming and Idaho Segments 6, 8, and 9	State Land in Idaho	Private Land in Idaho Segments 4, 5, 7, and 10
	BLM district. The Authorized Officer will designate the appropriate paleontologist depending on project location. Note that this is an agency imposed measure.						
PALEO-5	Field surveys will be completed prior to surface disturbance in areas with potential fossil yields of Class 3, 4, or 5, in accordance with criteria stated in the Paleontological Resources Protection Plan and as required by the land management agency. Note that this is an agency imposed measure.	•	•	•	Federal land only		
GEOLOGIC HAZARDS							
BLA-1, 2	(See description under Public Safety)						
GEO-1	Review the final location of the preferred alternative with affected mine operators and lessees to ensure all measures are taken to protect against subsidence.	•			•	•	•
GEO-2	A site-specific soil analysis shall be conducted prior to construction to verify any areas identified as unstable or marginally unstable on federal lands. A site-specific geotechnical analysis shall be conducted of federal lands prior to construction to locate areas where there is landslide risk. If such areas are identified, the Companies will develop mitigation and submit a report to the appropriate land management agency.	•		•	•		
SOILS							
WQA-1–17	(Described under Water Quality)						
SOIL-1	The Wyoming BLM State Reclamation Policy and applicable Agency management plan requirements for soil management will be followed on federal lands in the state of Wyoming.		•	•	•		
SOIL-2	The Companies will submit a Compaction Monitoring Plan for review and Agency approval prior to construction that specifies the conditions under which construction will either not start or will be shut down due to excessively wet soils. Conditions will be measurable in the field and easy to demonstrate to construction workers.	•			•	•	•
SOIL-3	During decommissioning, some obviously compacted areas, such as established newly constructed access roads, will require loosening prior to revegetation. If necessary to re-establish vegetation, the Companies will use a ripper blade, till, or similar instrument to loosen the surface soil layer.			•	•	•	•

Table 4-1. Environmental Protection Measures for Segments 1, 2, 3, and 3A

GATEWAY WEST TRANSMISSION LINE PROJECT

1	2	3-5			6-8		
		Application Phase			Applicable to Land Ownership		
EPM Number	Environmental Protection Measures	Design and Engineering	Construction	Operations and Maintenance	Federal Land and all Land in Wyoming and Idaho Segments 6, 8, and 9	State Land in Idaho	Private Land in Idaho Segments 4, 5, 7, and 10
SOIL-4	Detrimental soil disturbance such as compaction, erosion, puddling, and displacement will be minimized through implementing measures identified in the SWPPP. Measures may include road ripping, frequent waterbars, cross-ditching (e.g., rolling dips) or other methods to reduce compaction while preventing gully formation. Ripping pattern should be altered to a crossing, diagonal, or undulating pattern of tine paths to avoid concentrated runoff patterns that can lead to gullies.	•	•	•	•	•	•
SOIL-6	Reclamation of all temporary disturbances on NFS lands (such as road cuts) should include replacement of material to original contours and re-compaction to pre-disturbance compaction percentage (which should be identified during reclamation at adjacent locations to the disturbance). Guidelines for streambank re-compaction to maximize vegetative regrowth and mechanical stability are covered in USACE publication ERDC TN-EMRRP-SR-26.		•	•	•		
SOIL-7	In order to meet Forest Plan Soil Standards on NFS lands, the Reclamation Plan (approved by the USFS) will describe on-site restoration using topsoil salvaging.	•	•	•	•		
SOIL-8	When feasible, reroute all construction or maintenance activities around wet areas so long as the route does not cross into sensitive resource areas and at the approval of the CIC.	•	•	•	•	•	•
SOIL-9	Limit access of construction equipment to the minimum area feasible, remove and separate topsoil in wet or saturated areas subject to temporary disturbance, and stabilize subsurface soils with a combination of one or more of the following: perform grading to dewater problem areas, utilize weight dispersion mats, and maintain erosion control measures such as surface drilling and back-dragging. After construction is complete, regrade and recontour the area, replace topsoil, and reseed to achieve the success standard desirable plant covers as stated in the Reclamation Plan.	•	•	•	•	•	•
SOIL-10	Vegetation removal and soil disturbances (including temporary road improvements) will be minimized in areas where soil constraints occur. In areas of overland construction, where vegetation removal is required, mowing or cutting and/or back-dragging a cat blade will be the primary method used (also refer to Appendix D –Framework Reclamation Plan).		•	•	•	•	•
SOIL-11	Prior to construction, soils will be evaluated to determine if they are expansive and if they may have potential effects on the proposed facilities. Where they represent a potential hazard, solutions recommended by the Project's geotechnical engineer, such as excavation and replacement of the expansive soils with compacted backfill, will be required. If imported backfill material is used, it	•	•	•	•	•	•

Table 4-1. Environmental Protection Measures for Segments 1, 2, 3, and 3A

GATEWAY WEST TRANSMISSION LINE PROJECT

1	2	3-5			6-8		
		Application Phase			Applicable to Land Ownership		
EPM Number	Environmental Protection Measures	Design and Engineering	Construction	Operations and Maintenance	Federal Land and all Land in Wyoming and Idaho Segments 6, 8, and 9	State Land in Idaho	Private Land in Idaho Segments 4, 5, 7, and 10
	must be from a BLM/USFS-approved source and certified as free of invasive weeds and propagules (i.e., seeds and root fragments).						
SOIL-12	Limit disturbance of soils and vegetation removal to the minimum area necessary for access and construction.	•	•	•	•	•	•
SOIL-13	Inform all construction personnel, before they are allowed to work on the Project, of environmental concerns, pertinent laws and regulations, and elements of the erosion control plan.	•	•	•	•	•	•
SOIL-14	Slope and berm graded material, where possible, to reduce surface water flows across the graded area.	•	•	•	•	•	•
SOIL-15	Replace excavated materials in disturbed areas and minimize the time between excavation and backfilling.	•	•	•	•	•	•
SOIL-16	Direct the dewatering of excavations onto stable surfaces to avoid soil erosion.	•	•	•	•	•	•
SOIL-17	Re-establish native vegetation cover in highly erodible areas as quickly as possible following construction where determined necessary (refer to Appendix D –Framework Reclamation Plan).		•	•	•	•	•
SOIL-18	Construction water and water used for dust control will come from permitted sources identified by the Construction Contractor and a map showing the locations of these sources will be provided to the CIC. If the quality of the water is found to be causing any environmental changes (i.e., dying vegetation, excessively hard crusting of soils), the Construction Contractor will test the quality of the water and provide the results to the BLM for review.	•	•	•	•	•	•
SOIL-19	All Project personnel will be educated on dust control procedures.	•	•	•	•	•	•
SOIL-20	To prevent accelerated wind or water erosion on dirt roads, gravel mulches may be added if other mitigation measures are not adequate or if the area is not in a sensitive receptor zone. Gravel of approximately 0.75 to 1.5 inches in diameter should be used and cover a minimum of 90 percent of the soil surface. Slopes steeper than 3:1 may require additional sediment and erosion control structures.	•	•	•	•	•	•
SOIL-21	Surface roughening aids establishment of vegetative cover, reduces runoff velocities, increases infiltration, and reduces erosion by providing sediment trapping. Graded areas with smooth surfaces increase the potential for accelerated erosion; therefore, surfaces should be left in a roughened condition whenever possible.	•	•	•	•	•	•
SOIL-22	On steep slopes (greater than 30 percent) or in areas of concentrated flows (e.g., waterways) erosion control matting or riprap may be used to stabilize the surface and increase infiltration times.	•	•	•	•	•	•
SOIL-23	Areas graveled for stabilization will be inspected to ensure depressions caused by vehicle traffic are filled and runoff is not being directed toward wetlands or other receiving waters.		•	•	•	•	•

Table 4-1. Environmental Protection Measures for Segments 1, 2, 3, and 3A

GATEWAY WEST TRANSMISSION LINE PROJECT

1	2	3-5			6-8		
		Application Phase			Applicable to Land Ownership		
EPM Number	Environmental Protection Measures	Design and Engineering	Construction	Operations and Maintenance	Federal Land and all Land in Wyoming and Idaho Segments 6, 8, and 9	State Land in Idaho	Private Land in Idaho Segments 4, 5, 7, and 10
SOIL-24	Roughened surfaces should be periodically inspected for rills and washes. Areas exhibiting accelerated erosion will be filled and reseeded as necessary or determined by the BLM or USFS Authorized Officer or his/her designated representative.		•	•	•	•	•
SOIL-25	Construction, operation, and maintenance activities will be restricted when the soil is too wet to adequately support construction or maintenance equipment (i.e., when heavy equipment creates ruts in excess of 4 inches deep, over a distance of 50 feet or more in wet or saturated soils). This standard will not apply in areas with fine-grained soils, which easily form depressions even in dry weather.		•	•	•	•	•
WATER QUALITY							
WET-3	(Described under Streams and Wetlands)						
FISH-1	(Described under Fish)						
SOIL-9, 10, and 12-25	(Described under Soils)						
WQA-1	The appropriate NPDES permits for construction activities that disturb one acre or more of land will be obtained from the Department of Environmental Quality and USEPA or their designees.		•	•	•	•	•
WQA-2	NPDES permit requirements will be met. This includes implementing and maintaining appropriate BMPs for minimizing impacts to surface water.		•	•	•	•	•
WQA-3	One or more responsible persons will be designated to manage stormwater issues, conduct the required stormwater inspections, and maintain the appropriate records to document compliance with the terms of the NPDES permit.		•	•	•	•	•
WQA-4	The SWPPPs will be modified as necessary to account for changing construction conditions.		•	•	•	•	•
WQA-5	The SWPPPs will identify areas with critical erosion conditions that may require special construction activities or additional industry standards to minimize soil erosion.		•	•	•	•	•
WQA-6	Stormwater BMPs will be inspected and maintained on all disturbed lands during construction activities, as described in the SWPPP and appropriate NPDES permit.		•	•	•	•	•
WQA-7	Approved sediment and erosion control BMPs will be installed and maintained until disturbed areas meet final stabilization criteria.		•	•	•	•	•
WQA-8	Temporary BMPs will be used to control erosion and sediment at multi-purpose areas (equipment storage yards, fly yards, lay down areas) and substations.		•	•	•	•	•
WQA-9	The construction schedule may be modified to minimize construction activities in rain-soaked or muddy conditions.		•	•	•	•	•

Table 4-1. Environmental Protection Measures for Segments 1, 2, 3, and 3A

GATEWAY WEST TRANSMISSION LINE PROJECT

1	2	3-5			6-8		
		Application Phase			Applicable to Land Ownership		
EPM Number	Environmental Protection Measures	Design and Engineering	Construction	Operations and Maintenance	Federal Land and all Land in Wyoming and Idaho Segments 6, 8, and 9	State Land in Idaho	Private Land in Idaho Segments 4, 5, 7, and 10
WQA-10	Damaged temporary erosion and sediment control structures will be repaired in accordance with the SWPPP and appropriate NPDES permit.		•	•	•	•	•
WQA-11	Upon completion of construction, permanent erosion and sediment BMPs will be installed along the transmission line within the ROW, at substations, and at related facilities in accordance with the SWPPPs and appropriate NPDES permit.		•	•	•	•	•
WQA-12	In areas of droughty soils, the soil surfaces will be mulched and stabilized to minimize wind erosion and to conserve soil moisture in accordance with the SWPPPs.		•		•	•	•
WQA-13	Construction industry standard practices and BMPs will be used for spill prevention and containment.		•		•	•	•
WQA-14	Construction spills will be promptly cleaned up and contaminated materials hauled to a disposal site that meets local jurisdictional requirements.		•		•	•	•
WQA-15	All multi-purpose areas and fly yards will contain fueling areas with containment of a minimum of 110 percent capacity of the largest vehicle to be refueled therein. Fueling of vehicles will take place within the transmission line ROW under the guidance of the ROW grant/special-use authorization. The SPCC plan will specify BMPs.		•		•	•	•
WQA-16	If an upland spill occurs during construction, berms will be constructed with available equipment to physically contain the spill and prevent migration of hazardous materials toward waterways. Absorbent materials will be applied to the spill area. Dry materials will not be cleaned up with water or buried. Contaminated soils and other materials will be excavated and temporarily placed on and covered by plastic sheeting, or suitable containers, in a containment area a minimum of 100 feet away from any wetland or waterbody, until proper disposal is arranged in appropriately designated and approved areas off-site.		•		•	•	•
WQA-17	If a spill occurs which is beyond the capability of on-site equipment and personnel, an Emergency Response Contractor will be identified and available to further contain and clean up the spill.		•		•	•	•
WQA-18	For spills in standing water or where spilled materials reach water, floating booms, skimmer pumps, and holding tanks will be used as appropriate by the contractor to recover and contain released materials on the surface of the water. Other actions will be taken, as necessary, to clean up contaminated waters.		•		•	•	•
WQA-19	If pre-existing contamination is encountered during operations, work will be suspended in the area of the suspected contamination until the type and extent of the contamination is determined. The type and extent of contamination; the responsible party; and local, state, and federal regulations will determine the appropriate cleanup method(s) for these areas.		•		•	•	•

Table 4-1. Environmental Protection Measures for Segments 1, 2, 3, and 3A

GATEWAY WEST TRANSMISSION LINE PROJECT

1	2	3-5			6-8		
		Application Phase			Applicable to Land Ownership		
EPM Number	Environmental Protection Measures	Design and Engineering	Construction	Operations and Maintenance	Federal Land and all Land in Wyoming and Idaho Segments 6, 8, and 9	State Land in Idaho	Private Land in Idaho Segments 4, 5, 7, and 10
WQA-20	The SPCC Plan will include details on the types and quantities of absorbent and protective materials (e.g., visqueen, booms) that must be readily available to construction personnel and requirements for the restocking of materials.		•		•	•	•
WQA-21	Storage of materials such as fuels, other petroleum products, chemicals, and hazardous materials including wastes will be located in upland areas at least 500 feet away from streams, 400 feet for public wells, and 200 feet from private wells.		•		•	•	•
WQA-22	Pumps and temporary fuel tanks for the pumps will be stored in secondary containment. Containment will provide a minimum volume equal to 110 percent of the volume of the largest storage vessel located in the yard.		•		•	•	•
WQA-23	Avoid placement of road bed material in channels (perennial, intermittent or ephemeral). Road bed material contains considerable fines that would create sedimentation in coarse cobble dominated stream channels. Even in seasonally dry reaches those fines could be transported during flow periods and negatively impact fish spawning reaches below.	•	•	•	•	•	•
WQA-24	On federal lands, consult with appropriate land management agency staff prior to siting and design for stream crossings (location, alignment, and approach for culvert, drive-through, and ford crossings). This may include a hydrologist, engineer and, for perennial and many intermittent streams, an aquatic biologist.	•			•		
WQA-27	On non-federal lands, culvert placement should comply with state BMPs.		•	•		•	•
WQA-28	Migration of construction-related sediment to all adjacent surface waterbodies will be prevented.				•	•	•
WQA-29	If the Project proposes to obtain water from wells or surface water sources to suppress dust, written approval from the landowner or regulatory agency will be obtained prior to appropriation.		•				•
WQA-30	In the event of a spill, cleanup will be immediate. The Construction Contractor will keep spill kits in their vehicles to allow for quick and effective response to spills. Items to be included in the spill kit at a minimum are: • Protective clothing and gloves • Absorptive clay, "kitty litter," or other commercial absorbents • Plastic bags and a bucket • Shovel • Fiber brush and screw-in handle • Dust pan • Caution tape • Highway flares (use on established roads only) • Detergent		•		•	•	•

Table 4-1. Environmental Protection Measures for Segments 1, 2, 3, and 3A

GATEWAY WEST TRANSMISSION LINE PROJECT

1	2	3-5			6-8		
		Application Phase			Applicable to Land Ownership		
EPM Number	Environmental Protection Measures	Design and Engineering	Construction	Operations and Maintenance	Federal Land and all Land in Wyoming and Idaho Segments 6, 8, and 9	State Land in Idaho	Private Land in Idaho Segments 4, 5, 7, and 10
WQA-31	The response to a hazardous material spill will vary with the size and location of the spill, but general procedures include: • CIC and BLM, BOR, or USFS notification • Traffic control • Dressing the cleanup team in protective clothing • Stopping any leaks • Containing spilled material • Cleaning up and removing spilled pesticide and contaminated absorptive material and soil • Transporting spilled pesticide and contaminated material to an authorized disposal site		•		•	•	•
WQA-32	Physical response actions are intended to ensure all spills are immediately and thoroughly contained and cleaned up. However, the first priority in responding to any spill is personal and public safety. Construction personnel will be notified of evacuation procedures to be used in the event of a spill emergency, including evacuation routes. In general, the first person on the scene will: • Attempt to identify the source, composition, and hazard of the spill. • Notify appropriately trained personnel immediately. • Isolate and stop the spill, if possible, and begin cleanup (if it is safe). • Initiate evacuation of the area, if necessary. • Initiate reporting actions.		•	•	•	•	•
WQA-33	Persons should only attempt to cleanup or control a spill if they have received proper training and possess the appropriate protective clothing and cleanup materials. Untrained individuals should notify the appropriate response personnel. In addition to these general measures, persons responding to spills will consult Appendix P – Framework Hazardous Materials Management Plan, Appendix R – Operations, Maintenance, and Emergency Response Plan, and the MSDSs or USDOT Emergency Response Guidebook (to be maintained by the Construction Contractor onsite during all construction activities), which outlines physical response guides for hazardous materials spills.		•	•	•	•	•
WQA-34	In general, expert advice will be sought to properly cleanup major spills. After contaminated soil is recovered, all machinery used will be decontaminated, and recovered soil will be treated as hazardous waste. Contaminated cleanup materials (absorbent pads, etc.) and vegetation will be disposed of in a similar manner. For spills, cleanup may be verified by sampling and laboratory analysis at the discretion of the Companies.		•	•	•	•	•
WQA-35	If construction activity occurs within a wetland with standing water or a flowing stream, prior to construction, absorbent booms will be		•	•	•	•	•

Table 4-1. Environmental Protection Measures for Segments 1, 2, 3, and 3A

GATEWAY WEST TRANSMISSION LINE PROJECT

1	2	3-5			6-8		
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EPM Number	Environmental Protection Measures	Design and Engineering	Construction	Operations and Maintenance	Federal Land and all Land in Wyoming and Idaho Segments 6, 8, and 9	State Land in Idaho	Private Land in Idaho Segments 4, 5, 7, and 10
	placed on the water surface either around or downstream of the construction zone. In addition to this measure, cleanup materials, including absorbent spill pads and plastic bags, will be placed onsite at flowing streams and "wet" wetlands when construction is occurring within 200 feet of these areas (also refer to Appendix F – Framework Stormwater Pollution Prevention Plan).						
WQA-36	Emergency spill response kits will be maintained at all locations where hazardous materials are stored, in sufficient quantities based on the amount of materials stored onsite. Spill response equipment should be compatible with types of materials stored onsite. Spill response equipment should be inventoried regularly to ensure spill response equipment is adequate for the type and quantities of materials being used. The following equipment, are examples of spill response equipment for use in cleanup situations: • Shovels • Absorbent pads/materials • Personal protective gear • Medical first-aid supplies • Bung wrench (nonsparking) • Phone list with emergency contact numbers • Storage containers • Communications equipment		•	•	•	•	•
WQA-37	The Construction Contractor and subcontractors shall provide spill prevention and response training to appropriate construction personnel. Persons accountable for carrying out spill response activities will be designated prior to construction and informed of their specific duties and responsibilities with respect to environmental compliance and hazardous materials. The training shall inform appropriate personnel of site-specific environmental compliance procedures. Training of personnel should be completed at least once a year. All training events should be documented, including the date and names of those personnel in attendance. These records shall be maintained with the SPCC Plan and/or Hazardous Materials Management Plan. At a minimum, this training shall include the following: • An overview of regulatory requirements • Methods for the safe handling/storage of hazardous materials • Spill prevention procedures • Emergency response procedures • Use of personal protective equipment • Use of spill cleanup equipment • Procedures for coordinating with emergency response teams • Procedures for notifying agencies • Procedures for documenting spills		•	•	•	•	•

Table 4-1. Environmental Protection Measures for Segments 1, 2, 3, and 3A

GATEWAY WEST TRANSMISSION LINE PROJECT

1	2	3-5			6-8		
		Application Phase			Applicable to Land Ownership		
EPM Number	Environmental Protection Measures	Design and Engineering	Construction	Operations and Maintenance	Federal Land and all Land in Wyoming and Idaho Segments 6, 8, and 9	State Land in Idaho	Private Land in Idaho Segments 4, 5, 7, and 10
	• Identification of sites/areas requiring special treatment, if any						
WQA-38	Notification and documentation procedures for spills that occur during Project construction, operation, or maintenance will conform to applicable federal, state, and local laws and regulations. Adherence to such procedures will be the top priority once initial safety and spill response actions have been taken.		•	•	•	•	•
WQA-39	Notification will begin as soon as possible after discovery of a spill. The individual who discovers the spill will contact the Contractor's supervisory personnel and the CIC. If the Construction Contractor determines the spill may seriously threaten human health or the environment, he/she will orally report the discharge as soon as possible, but no later than 24 hours from the time they become aware of the circumstances, as directed below. A written report must be submitted to Wyoming or Idaho Department of Environmental Quality (DEQ) within 15 days. Prior to initiating notification, the Construction Contractor (or individual initiating notification) should obtain as much information as possible, including: • current threats to human health and safety, include known injuries, if any • spill location, including landmarks and nearest access route • reporter's name and phone number • time spill occurred • type and estimated amount of hazardous materials involved • potential threat to property and environmental resources, especially streams and waterways • status of response actions		•	•	•	•	•
WQA-40	The following mandatory notifications will be made by the Construction Contractor. These numbers should be documented in the SPCC plan, along with the contact information for the cleanup contractor. Select and notify the appropriate government agencies based on geographic location of the spill site. • Wyoming DEQ (24 hours) at (307) 777-7781. • Idaho Communication Center (24 hours) at (800) 632-8000 or (208) 846-7610. • If spill threatens human health, call 911, and the appropriate county response center. • National Response Center (NRC) (800) 424-8802. The NRC should be notified of a reportable spill as required by 40 CFR 110, 40 CFR 117, and/or 49 CFR 171. The Construction Contractor will verify and update these emergency phone numbers before and during construction. The Construction Contractor (or other person in charge) will notify the CIC of all spills or potential spills within construction areas.		•	•	•	•	•

Table 4-1. Environmental Protection Measures for Segments 1, 2, 3, and 3A

GATEWAY WEST TRANSMISSION LINE PROJECT

1	2	3-5			6-8		
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EPM Number	Environmental Protection Measures	Design and Engineering	Construction	Operations and Maintenance	Federal Land and all Land in Wyoming and Idaho Segments 6, 8, and 9	State Land in Idaho	Private Land in Idaho Segments 4, 5, 7, and 10
WQA-41	When a spill poses a direct and immediate threat to health and safety and/or property, the land management agency and landowners potentially affected by a spill will be notified directly by the Construction Contractor. Immediate notification of land management agencies and landowners is required for all situations in which the spill poses a direct and immediate threat to health and safety and/or property. Failure to report a spill could result in substantial penalties and fines.		•	•	•	•	•
WQA-42	The Construction Contractor will maintain records for all spills. State and federal agencies that have been verbally notified of a spill will be informed in writing within 10 days for state agencies and 30 days for federal agencies.		•	•	•	•	•
WQA-43	The Construction Contractor shall record spill information in a daily log. The following is a list of items that should be included in the daily log (as appropriate, based on the spill incident): • time and date of each log entry • name of individual recording log entry • list of all agencies notified, including name of individual notified, time, and date • type and amount of material spill • resources affected by spill • list of response actions taken, including relative success • copies of letters, permits, or other communications received from government agencies throughout the duration of the spill • copies of all outgoing correspondence related to the spill • photographs of the response effort (and surrounding baseline photographs if relevant)		•	•	•	•	•
WQA-44	During the Project's operation and maintenance phase, the Companies will ensure its facilities, personnel, and contractors comply with federal, state, and local laws and regulations pertaining to the use, storage, transport, and disposal of hazardous materials and adhere to required emergency response and cleanup procedures in the event of a hazardous material spill. The Companies and all operations and maintenance subcontractors shall develop hazardous materials management and response plans and properly train employees for handling, packaging, and shipping hazardous materials and responding to hazardous materials spills or emergency events.			•	•	•	•
WQA-45	Reclaim stream channels/bottoms and wetlands to their approximate preconstruction configuration/contours, unless the original stream bank contours are excessively steep and/or unstable and a more stable final contour can be specified or where permanent stream crossings must be created to maintain access throughout the life of the Project.	•	•	•	•	•	•

Table 4-1. Environmental Protection Measures for Segments 1, 2, 3, and 3A

GATEWAY WEST TRANSMISSION LINE PROJECT

1	2	3-5			6-8		
		Application Phase			Applicable to Land Ownership		
EPM Number	Environmental Protection Measures	Design and Engineering	Construction	Operations and Maintenance	Federal Land and all Land in Wyoming and Idaho Segments 6, 8, and 9	State Land in Idaho	Private Land in Idaho Segments 4, 5, 7, and 10
WQA-46	Stabilize stream banks, wetlands, and adjacent upland areas by establishing permanent erosion control measures and vegetation cover after the completion of construction (refer to Appendix N – Framework Erosion, Dust Control, and Air Quality Plan and Appendix D – Framework Reclamation Plan).		•	•	•	•	•
WQA-47	Use permanent waterbars, if needed, on slopes above streams or wetland boundaries, on travel routes, and along the ROW to minimize sediment flow from adjacent uplands into the stream or wetland.		•	•	•	•	•
WQA-48	Remove all prefabricated equipment pads, swamp mats, and geotextile fabric used for stream and wetland crossings on completion of construction.		•		•	•	•
LAND USE							
TRANS-5	(See description under Transportation)						
LU-1	Signs shall be posted at access points to access roads where public access is restricted by a land use plan, and on private, state, and Tribal lands at the request of the landowner, agency, or Tribal government. Signs shall indicate the restriction or regulation, location, penalty for violation, and appropriate contact information for reporting violations. Signage shall be maintained and replaced as part of the routine maintenance.			•	•	•	•
AGRICULTURE							
AGRI-1	Consult with the Farm Service Agency and landowners to determine how construction may affect the CRP status of the land currently enrolled in CRP.	•					•
TRANSPORTATION							
FIRE-6	(See description in Public Safety (Blasting, Fire, Contamination)						
TRANS-1	A Final Traffic and Transportation Management Plan will be developed and implemented to provide site-specific details showing how the Project will comply with the EPMs listed in this attachment. The Final Traffic and Transportation Management Plan will be submitted to, and approved by, the appropriate federal, state, and local agencies with authority to regulate use of public roads, and approved prior to the issuance of a Notice to Proceed with construction.	•			•	•	•
TRANS-2	If a construction method requires the closure of a state- or county-maintained road for more than 1 hour, a plan will be developed to accommodate traffic as required by a county or state permit.	•	•			•	•
TRANS-3	On county- and state-maintained roads, caution signs will be posted on roads, where appropriate, to alert motorists of construction and warn them of slow traffic. Traffic control measures such as traffic control personnel, warning signs, lights, and barriers will be used during construction to ensure safety and to minimize traffic congestion.	•	•			•	•

Table 4-1. Environmental Protection Measures for Segments 1, 2, 3, and 3A

GATEWAY WEST TRANSMISSION LINE PROJECT

1	2	3-5			6-8		
		Application Phase			Applicable to Land Ownership		
EPM Number	Environmental Protection Measures	Design and Engineering	Construction	Operations and Maintenance	Federal Land and all Land in Wyoming and Idaho Segments 6, 8, and 9	State Land in Idaho	Private Land in Idaho Segments 4, 5, 7, and 10
TRANS-4	To reduce traffic congestion and roadside parking hazards, an equipment yard will be provided for primary parking for employee personal vehicles.	•	•		•	•	•
TRANS-5	Unauthorized vehicles will not be allowed within the construction ROW or along roadsides near the ROW.		•		•	•	•
TRANS-6	Construction vehicles will follow a 25 mph speed limit on unposted project roads.		•		•	•	•
TRANS-7	Landowners will be notified at least 48 hours prior to the start of construction within 0.25 mile of a residence.		•		•	•	•
TRANS-8	Emergency vehicle access to private property will be maintained.		•				•
TRANS-9	Roads in residential areas will be restored as soon as possible, and construction areas near residences will be fenced off at the end of the construction day, without blocking residential traffic.		•				•
TRANS-10	Roads negatively affected by construction and as identified by the applicable jurisdictional agency and/or landowner will be returned to preconstruction condition. The method of preconstruction condition documentation will be coordinated by the Construction Contractor and the applicable jurisdictional agency and/or landowner.		•		•	•	•
TRANS-11	Roads developed specifically for this project that are identified by the Companies as no longer necessary will be reclaimed as specified in the Final Reclamation Plan. Culverts will be removed.		•		•	•	•
TRANS-12	The Companies will attempt to identify existing two-track trails as preferred access roads for construction when existing maintained (e.g., gravel or asphalt) roads are not available.	•	•		•	•	•
TRANS-13	Roads will be designed so proper drainage is not impaired and roads will be built to minimize soil erosion. Consult with appropriate Agencies during the design stage.	•	•	•	•	•	•
TRANS-14	Access roads built for the Project on federal lands shall be closed to the public unless otherwise agreed upon with the land management agency. Signs shall indicate the restriction or regulation, location, penalty for violation, and appropriate contact information for reporting violations. Signage and road closure measures shall be evaluated during routine visits and maintained or replaced as necessary as part of routine maintenance. Access roads constructed solely for use by the Companies will be maintained by the Companies as needed for the Companies' use in accordance with the ROW grants/special use authorization.	•	•	•	•		
TRANS-15	Roads to be abandoned may be left intact through mutual agreement of the land management agency, landowner, the tenant, and the Companies, unless located in flood areas or drainage hazard areas or otherwise restricted by federal, state, or local regulations.	•	•	•	•	•	•

Table 4-1. Environmental Protection Measures for Segments 1, 2, 3, and 3A

GATEWAY WEST TRANSMISSION LINE PROJECT

1	2	3-5			6-8		
		Application Phase			Applicable to Land Ownership		
EPM Number	Environmental Protection Measures	Design and Engineering	Construction	Operations and Maintenance	Federal Land and all Land in Wyoming and Idaho Segments 6, 8, and 9	State Land in Idaho	Private Land in Idaho Segments 4, 5, 7, and 10
TRANS-16	All temporary culverts and associated fill material will be removed from stream crossings after construction. All permanent culverts will be engineered by the Construction Contractor and approved by the Companies prior to installation.		•		•	•	•
TRANS-17	The road or highway within the ROW corridor shall be used to the maximum extent possible for construction and maintenance of the new ROW.	•	•	•	•	•	•
TRANS-18	To help set public expectations for when temporary access roads are decommissioned, signs shall be posted on all temporary roads and overland access routes identifying them as reclamation areas. Signs will state "Restoration in Progress – No Vehicle Traffic Allowed."		•	•	•	•	
TRANS-19	During wet road conditions, any ruts deeper than 4 inches remaining on the roads from the Project will be repaired.	•	•	•	•		
AIR QUALITY							
FISH-3	(Described under Fish)						
TESWL-12	(Described under TES-Wildlife)						
SOIL-18 and 19	(Described under Soils)						
AIR-1	Minimize idling time for diesel equipment whenever possible.		•		•	•	•
AIR-2	Ensure that diesel-powered construction equipment is properly tuned and maintained, and shut off when not in direct use.		•		•	•	•
AIR-3	Prohibit engine tampering to increase horsepower.		•		•	•	•
AIR-4	Reduce construction-related trips as feasible for workers and equipment, including trucks.		•		•	•	•
AIR-5	Dust suppression techniques will be applied, such as watering construction areas or removing dirt tracked onto a paved road as necessary to prevent safety hazards or nuisances on access roads and in construction zones near residential and commercial areas and along major highways and interstates.		•		•	•	•
ELECTRICAL ENVIRONMENT							
EE-1	During final design, limit the conductor surface gradient in order to meet the IEEE Radio Noise Guideline.	•	•			•	•
EE-2	During construction, identify objects such as fences, metal buildings, pipelines, and other metal objects within or near the proposed ROW that have the possibility for induced potentials and currents and implement electrical grounding of these objects according to the utility's and National Electric Code standards.		•		•	•	•
EE-3	During final design and construction, identify areas where large equipment is anticipated and provide sufficient conductor clearance to ground to meet the NESC 5 mA rule or limit size or access of large equipment.	•	•			•	•
PUBLIC SAFETY (Blasting, Fire, Contamination)							

Table 4-1. Environmental Protection Measures for Segments 1, 2, 3, and 3A

GATEWAY WEST TRANSMISSION LINE PROJECT

1	2	3-5			6-8		
		Application Phase			Applicable to Land Ownership		
EPM Number	Environmental Protection Measures	Design and Engineering	Construction	Operations and Maintenance	Federal Land and all Land in Wyoming and Idaho Segments 6, 8, and 9	State Land in Idaho	Private Land in Idaho Segments 4, 5, 7, and 10
WQA-13 - 20	(Described under Water Quality)						
WEED-24, 25	(Described under Weeds)						
WILD-11	(Described under Wildlife)						
BLA-1	The Blasting Plan will identify blasting procedures including safety, use, storage, and transportation of explosives that will be employed where blasting is needed, and will specify the locations of needed blasting.		•		•	•	•
BLA-2	All blasting will be performed by registered licensed blasters who will be required to secure all necessary permits and comply with regulatory requirements in connection with the transportation, storage, and use of explosives, and blast vibration limits for nearby structures, utilities, wildlife, and fish (where blasting is conducted in waterbodies).		•		•	•	•
BLA-3	Appropriate flags, barricades, and warning signals will be used to ensure safety during blasting operations. Blast mats will be used when needed to prevent damage and injury from fly rock.		•		•	•	•
BLA-4	Blasting in the vicinity of pipelines will be coordinated with the pipeline operator, and will follow operator-specific procedures, as necessary.		•		•	•	•
BLA-5	Damages that result from blasting will be repaired or the owner fairly compensated.		•		•	•	•
BLA-6	Proper blasting techniques, including proper cover of charges, will be followed.		•		•	•	•
BLA-7	Matting will be used in rock blasting operations to minimize and control dust.		•		•	•	•
BLA-8	Notification of blasting activities will be provided to nearby residents.		•		•	•	•
BLA-9	The Construction Contractor will prepare site specific blasting plans.	•	•		•	•	•
BLA-10	The Blasting Plan for the proposed Project will also stipulate the following:	•	•		•	•	•

Table 4-1. Environmental Protection Measures for Segments 1, 2, 3, and 3A

GATEWAY WEST TRANSMISSION LINE PROJECT

1	2	3-5			6-8		
		Application Phase			Applicable to Land Ownership		
EPM Number	Environmental Protection Measures	Design and Engineering	Construction	Operations and Maintenance	Federal Land and all Land in Wyoming and Idaho Segments 6, 8, and 9	State Land in Idaho	Private Land in Idaho Segments 4, 5, 7, and 10
	• Explosives will not be stored on federal land without prior written permission from the land-management agency. Copies of this permission will be posted on each magazine. • Seventy-two hours advance notice of blasting activities will be given to the land-management agency, railroads, highway departments, and local communities; occupants of nearby residences, buildings, and businesses; and local farmers. • Warning signs will be erected and maintained at all approaches to the blast areas and flaggers will be stationed on all roadways passing within 1,000 feet of blasting activities. • Explosives will not be primed or fused until just before use. • Blasting will take place during daylight hours only and will be monitored with three axis seismographs to ensure safe vibration levels are not exceeded. • Vibration measured as peak particle velocity will not exceed 4 inches per second adjacent to an underground pipeline and 2 inches per second for any aboveground structure (including water wells).						
FIRE-1	Train all personnel about the measures to take in the event of a fire including; fire dangers, locations of extinguishers and equipment, emergency response, and individual responsibilities for fire prevention and suppression.		•	•	•	•	•
FIRE-2	Equip all construction equipment operating with internal combustion engines (including off-highway vehicles, chainsaws, generators, heavy equipment, etc.) with spark arresters. Qualified spark arresters will be in a maintained and nonmodified condition and meet U.S. Department of Agriculture Forest Service Standard 5100-1a, or the Society of Automotive Engineers Recommended Practices J335 or J350. Refer to 43 Code of Federal Regulations §8343.1.		•	•	•	•	•
FIRE-3	Restrict motorized equipment, including worker transportation vehicles, to the designated and approved work limits. Operate all vehicles on designated roads or park in areas where vegetation is less than 8 inches tall. Vehicles, including the undercarriages, will be cleared of vegetation accumulations and checked periodically to ensure no buildup of flammable vegetation.		•	•	•	•	•
FIRE-4	Require all motor vehicles and equipment to carry, and individuals using handheld power equipment to have, specified fire prevention equipment. Carry shovels, water, and fire extinguishers on all equipment and vehicles. Equipment will carry extinguishers rated ABC-10 pound minimum and vehicles will carry ABC-2.5 pound minimum.		•	•	•	•	•
FIRE-5	Provide a list of equipment capable of being adapted to fighting fires to local fire protection agencies.		•	•	•	•	•

Table 4-1. Environmental Protection Measures for Segments 1, 2, 3, and 3A

GATEWAY WEST TRANSMISSION LINE PROJECT

1	2	3-5			6-8		
		Application Phase			Applicable to Land Ownership		
EPM Number	Environmental Protection Measures	Design and Engineering	Construction	Operations and Maintenance	Federal Land and all Land in Wyoming and Idaho Segments 6, 8, and 9	State Land in Idaho	Private Land in Idaho Segments 4, 5, 7, and 10
FIRE-6	Notify the appropriate fire suppression agencies of scheduled road closures.		•	•	•	•	•
FIRE-7	Prohibit burning of slash, brush, stumps, trash, explosives storage boxes, or other Project-generated debris unless authorized by the applicable land management agency.		•	•	•	•	•
FIRE-8	Designate a Fire Guard on each construction crew prior to the start of construction activities each day and provide a communications system for maintaining contact with fire control agencies.		•	•	•	•	•
FIRE-9	The Companies shall comply with fire restrictions and/or waivers as applicable.		•	•	•	•	•
FIRE-10	If a fire spreads beyond the suppression capability of workers with these tools, all will cease fire suppression action and leave the area immediately via pre-identified escape routes.		•	•	•	•	•
FIRE-11	Initiate fire suppression actions in the work area to prevent fire spread to or on federally administered lands. If fire ignitions cannot be prevented or contained immediately, or it may be foreseeable to exceed the immediate capability of workers, the operation must be modified or discontinued. No risk of ignition or re-ignition will exist on leaving the operation area.		•	•	•	•	•
FIRE-12	Prior to any operation involving potential sources of fire ignition from vehicles, equipment, or other means, review weather forecasts and potential fire danger. Prevention measures to be taken each workday will be included in the specific job briefing. Consideration for additional mitigation or discontinuing the operation must be given in periods of extreme wind and dryness.		•	•	•	•	•
FIRE-13	Operate welding, grinding, or cutting activities in areas cleared of vegetation within range of the sparks for that particular action. A spark shield adequate for the sparks may be used to prevent sparks from carrying. A spotter equipped with a round-nose shovel and two ABC-rated 5-pound fire extinguishers and a 5-gallon backpack waterpump is required to watch for ignitions during, and one hour after, the activity. Water may be used to wet down surrounding vegetation but does not take the place of an adequately cleared area and spark shield.		•	•	•	•	•
FIRE-14	No smoking will be allowed while operating equipment or while walking or working in areas with vegetation.		•	•	•	•	•
FIRE-15	Smoke only in cleared areas.		•	•	•	•	•
FIRE-16	In areas where smoking is allowed, completely extinguish all burning tobacco and matches and discard them in ash trays, not on the ground.		•	•	•	•	•
FIRE-17	Do not allow any fires or barbecues on the transmission line ROW, at material yards, substations, access roads, or other construction areas.		•	•	•	•	•

Table 4-1. Environmental Protection Measures for Segments 1, 2, 3, and 3A

GATEWAY WEST TRANSMISSION LINE PROJECT

1	2	3-5			6-8		
		Application Phase			Applicable to Land Ownership		
EPM Number	Environmental Protection Measures	Design and Engineering	Construction	Operations and Maintenance	Federal Land and all Land in Wyoming and Idaho Segments 6, 8, and 9	State Land in Idaho	Private Land in Idaho Segments 4, 5, 7, and 10
FIRE-18	Clear away all flammable material to a minimum of 10 feet, including snags (fallen or standing dead trees) from areas of operation where a spark, fire, or flame could be generated.		•	•	•	•	•
FIRE-19	If a fire does start by accident, take immediate steps to extinguish it (if it is safe to do so) using available fire suppression equipment and techniques taught at field crew emergency response training provided by the Construction Contractor or the Companies.		•	•	•	•	•
CON-1	All construction staff will be trained on the types of contamination that could be encountered and how to respond if contamination is encountered.		•		•		
NOISE							
NOISE-1	Identify and provide a public liaison person before, and during, construction to respond to concerns of neighboring receptors, including residents, about construction noise disturbance.		•	•	•	•	•
NOISE-2	Establish a toll-free telephone number for receiving questions or complaints during construction, and develop procedures for responding to callers.		•		•	•	•
NOISE-3	Implement and maintain a noise complaint review process to deal with residents' or other potential queries and complaints as they arise. Such complaints will be logged and investigated on an individual basis to facilitate resolution of the issue of concern.		•		•	•	•

1/ TESWL-3 has been offered by the Companies; however, although the Companies are encouraged to protect all prairie dog towns, formal black-footed ferret surveys within those towns will no longer be required by the BLM.

AGRI – agriculture; AIR – air quality; BLA – blasting; CON – contamination; CR – cultural resources; EE – electrical environment; FIRE – fire; FISH – fish; G – general; GEO – geologic

Rocky Mountain Power
Exhibit RMP___(RAV-17)
Docket No. 17-035-40
Witness: Rick A. Vail

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

Exhibit Accompanying Direct Testimony of Rick A. Vail

Proxy Stormwater Pollution Prevention Plan

June 2017

Submittal Number: 11051-PLAN-010 (FINAL)

ECS Project No. 11-051
Contract No. 3000091215
Sigurd – Red Butte 345kV
Transmission Line Project

STORMWATER POLLUTION PREVENTION PLAN

Volume I

Prepared by:

Energy Environmental Group, Inc.

4143 E. Quartz Circle, Suite 104,

Mesa, Arizona

www.ecsourceservices.com

April 2013

UTAH POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT

The 1972 amendments to the Federal Water Pollution Control Act (known as the Clean Water Act or CWA) provide the statutory basis for the National Pollutant Discharge Elimination System (NPDES) permit program. Section 402 of the CWA specifically required the US Environmental Protection Agency (EPA) to develop and implement the NPDES program (CWA Title 40 CFR at Part 122). To comply with the criteria in the EPA's Clean Water Act, all construction site operators engaged in clearing, grading, and excavating activities that disturb one acre or more, must obtain a NPDES permit for stormwater discharges.

The CWA also allowed the EPA to authorize the NPDES Permit Program to State governments, enabling States to perform many of the permitting, administrative, and enforcement aspects of the NPDES Program (CWA section 402 Title 40 CFR at Part 123). For the State of Utah, the Utah Department of Environmental Quality (UDEQ) issues the Utah Pollutant Discharge Elimination System (UPDES) Storm Water General Permit for Construction Activities (General Permit) No. UTR300000. This General Permit, as currently issued by the UDEQ, expires at midnight, June 13, 2013 except as described in Part 2.4 of the permit. At that time, coverage under a new or alternate permit may be required. A copy of General Permit can be found in Appendix A.

General requirements of the General Permit includes submission of UPDES Notice of Intent (NOI); permitting fee; development, implementation, and maintenance of a Stormwater Pollution Prevention Plan (SWPPP); and submission of Notice of Termination (NOT).

Submission of the NOI and permitting fee must be made to the UDEQ Division of Water Quality prior to construction. Coverage starts on the date the NOI is submitted. The fee is determined based on the length of time coverage is required. If a facility has the potential to discharge into a municipal separate storm sewer system (MS4), the MS4 may require a copy of the NOI. A MS4 is an organization of drainage basins, curbs, gutters, ditches, pipes, tunnels, or storm drains that discharges into waters of the United States. Coverage under the General Permit ends upon submittal of the NOT.

Once received, a copy of the NOI for the Sigurd to Red Butte 345 kV Transmission Line Project (Project) will be located in Appendix B – Notice of Intent of this SWPPP.

A NOT form is located in Appendix C – Notice of Termination. The NOT for the General Permit will not be submitted for the Project until final stabilization are measures, as defined in the General Permit and signed off on by Rocky Mountain Power.

UDEQ - Division of Water Quality
Mailing Address: P.O. Box 144870
Salt Lake City, Utah 84114-4870
Physical Address: 195 North 1950 West
Salt Lake City, Utah 84116
Phone: 801-538-4300
Fax: 801-538-4301
Office Hours: Monday-Friday, 8am to 5pm

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ECS Project No. 11-051
Contract No. 3000091215
PacifiCorp Sigurd – Red Butte
345kV Transmission Line Project

STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

Stormwater runoff becomes polluted by picking up soil particles and other pollutants as it flows over surfaces where construction activities are occurring. The basic goal of stormwater management, therefore, is simple: "Improve water quality by reducing pollutants in storm water discharges."[1] This document establishes a program to manage the quality of stormwater runoff from construction activities associated with the Project, and to fulfill the requirements of the General Permit.

In order to meet the requirement of the General Permit, this SWPPP will:

- Identify the responsible party or parties for SWPPP implementation
- Define site characteristics and the type of construction that will be occurring
- Describe the practices that will be implemented to control erosion and the release of pollutants in stormwater
- Identify an implementation schedule to ensure the practices described in the SWPPP are in fact implemented
- Describe the inspection and evaluation program used to evaluate the plan's effectiveness in reducing erosion, sediment, and pollutant levels in stormwater discharge from the site
- Describe maintenance requirements to ensure the continued effectiveness of erosion and sediment control devices
- Describe the final stabilization/termination design to minimize erosion and prevent stormwater impacts after construction is complete

A master copy of this SWPPP, including a copy of the General Permit, NOI, and any amendments to the SWPPP, shall be retained at the primary Project office in Milford, Utah until Project completion and submission of the NOT. Additional copies of the SWPPP will be available at each field office. Posted notices will also be located throughout the Project indicating the location of the SWPPP, along with a contact phone number. The SWPPP will be made available for review to the public or representatives of a Federal, State or local agency upon request.

All records pertaining to the SWPPP shall retained by EC Source for a minimum of three years after submission of the Project NOT.

---

[1] U.S. Environmental Protection Agency, 1992. Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices. Washington, D.C.

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ECS Project No. 11-051
Contract No. 3000091215
PacifiCorp Sigurd – Red Butte
345kV Transmission Line Project

PLAN CERTIFICATION

I certify under penalty of law that this document and all of its attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Printed Name: Larry Kahl Title: Senior Vice President of Project Management

Signature: Larry Kahl Date: 4/30/13

Printed Name: Debbie Greenacre Title: Vice President of Environmental Management

Signature: Debbie Greenacre Date: 4/30/13

GENERAL INFORMATION

Company Name:	EC Source Services
Facility Address:	1345 S. 350 W., Richfield, UT 84701.
County:	Sevier County
Phone:	(435)503-5900

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ECS Project No. 11-051
Contract No. 3000091215
PacifiCorp Sigurd-Red Butte
345kV Transmission Line Project

DELEGATION OF AUTHORITY

I, Larry Kahl, hereby designate Company below to be a duly authorized representative for the purpose of overseeing compliance with environmental requirements, including the Construction General Permit, for the Sigurd to Red Butte 345kV Transmission Line Project. The designee is authorized to sign any reports, stormwater pollution prevention plans, and all other documents required by the permit.

Company : Energy Environmental Group, Inc. (EEG)

Company Address: 4143 E. Quartz Circle, suite 104

Name: Sid Strauss

Title: President

Signature:

Phone Number: (480)297-8762

Date:

By signing this authorization, I confirm that I meet the requirements to make such a designation as set forth in the Storm Water General Permit for Construction Activities Permit No. UTR300000, and that the designee above meets the definition of a "duly authorized representative" as set forth in the General Permit.

"I certify under penalty of law that this document and all attachments were prepared under my direction of supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Name: Larry Kahl

Company: EC Source Services, LLC

Title: Senior Vice President of Project Management

Signature: Larry Kahl

Date: 4/30/13

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ECS Project No. 11-051
Contract No. 3000091215
PacifiCorp Sigurd - Red Butte
345kV Transmission Line Project

SUBCONTRACTOR CERTIFICATION
STORMWATER POLLUTION PREVENTION PLAN

As a subcontractor, you are required to comply with the Stormwater Pollution Prevention Plan (SWPPP) for any work that you perform on-site. Any person or group who violates any condition of the SWPPP may be subject to substantial penalties or loss of contract. You are encouraged to advise each of your employees working on this project of the requirements of the SWPPP. A copy of the SWPPP is available for your review at the office trailer.

Each subcontractor engaged in activities at the construction site that could impact stormwater must be identified and sign the following certification statement:

I certify under the penalty of law that I have read and understand the terms and conditions of the SWPPP for the above designated project and agree to follow the BMPs and practices described in the SWPPP.

This certification is hereby signed in reference to the above named project:

Company: T&D Power, Inc

Address: 4143 E. Quartz Circle Suite 104, Mesa, AZ

Telephone Number: (480) 218-9711

Type of construction service to be provided: Powerline construction services to include access roads, pad sites, foundations, steel erection, and wire installations.

Signature: Joe Stone

Printed Name: Joe Stone

Title: Construction Superintendent

Date: 4-30-13

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ECS Project No. 11-051
Contract No. 3000091215
PacifiCorp Sigurd - Red Butte
345kV Transmission Line Project

SUBCONTRACTOR CERTIFICATION
STORMWATER POLLUTION PREVENTION PLAN

As a subcontractor, you are required to comply with the Stormwater Pollution Prevention Plan (SWPPP) for any work that you perform on-site. Any person or group who violates any condition of the SWPPP may be subject to substantial penalties or loss of contract. You are encouraged to advise each of your employees working on this project of the requirements of the SWPPP. A copy of the SWPPP is available for your review at the office trailer.

Each subcontractor engaged in activities at the construction site that could impact stormwater must be identified and sign the following certification statement:

I certify under the penalty of law that I have read and understand the terms and conditions of the SWPPP for the above designated project and agree to follow the BMPs and practices described in the SWPPP.

This certification is hereby signed in reference to the above named project:

Company: Energy Environmental Group, EEG

Address: 4143 E. Quartz Circle Suite 104, Mesa, AZ

Telephone Number: (480) 218-9711

Type of construction service to be provided: Environmental compliance services to include installation, maintenance, and monitoring of SWPPP BMPs.

Signature:

Printed Name: Sid Strauss

Title: President

Date:

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ECS Project No. 11-051
Contract No. 3000091215
PacifiCorp Sigurd – Red Butte
345kV Transmission Line Project

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ECS Project No. 11-051
Contract No. 3000091215
PacifiCorp Sigurd – Red Butte
345kV Transmission Line Project

SECTION 1: SITE EVALUATION, ASSESSMENT, AND PLANNING

1.1 Project/Site Information

Project Name

Sigurd to Red Butte 345 kV Single-Circuit Transmission Line Project (Project)

Project Location

The Sigurd to Red Butte 345 kV Transmission Line is a utility project whose purpose is to deliver electrical power and address system reliability to customers in the Rocky Mountain Power (RMP) service area. The Project is approximately 170 miles and spans from the Sigurd Substation in Sevier County, Utah to the Red Butte Substation in Washington County, Utah. The Project will traverse through five Utah Counties: Sevier, Millard, Beaver, Iron, and Washington. Of the 170 mile long transmission line, approximately 112 miles will be located on Federal lands with the remaining 58 miles located on privately owned and State lands.

The northern terminus of the line, at the Sigurd Substation, is located 6 miles northeast of the City of Richfield, Utah. The southern terminus, at the Red Butte Substation, is located just west of State Route 18, near the community of Central in Washington County, Utah.

To date, seven material and construction support yards have been identified for the Project as listed below.

Facility Name (1):	Milford Headquarters/Operating Facility
Address (1):	1341 Utah 257, Milford, UT 84751
Phone Number (1):	(435) 503-5900
Facility Name (2):	Beaver City Operating Facility
Address (2):	2065S 550W Beaver, UT 84713
Phone Number (2):	
Facility Name* (3):	Richfield Materials Yard
Address (3):	1345S 350W, Richfield, UT 84701
Phone Number (3):	(435) 503-5900
Facility Name* (4):	Cove Fort Material Yard
Address (4):	38˚36’49.38”N, 112˚36’48.67”W
Phone Number (4):	
Facility Name* (5):	New Castle Multi Use Construction Yard
Address (5):	UTM 0276492, 4172750
Phone Number (5):	(435) 503-5900

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Facility Name* (6):	Enterprise Yard
Address (6):	5200S & Utah State Hwy 18, Enterprise, UT 84725
Phone Number (6):	(435) 503-5900
Facility Name* (7):	Elsinore Staker-Parson Pit
Address (7):	180W 1400S, Elsinore, UT 84724
Phone Number (7):	(435) 503-5900

**Additional locations will be added as they are established.*

Location maps can be found in Appendix D- Facility Location and Site Maps.

Midpoint on the Project alignment is: Latitude: 38° 44' 66.02" N Longitude: 113° 04' 00.01" W

The method used for determining the midpoint latitude/longitude was U.S. Geological Survey (USGS) topographic map (Scale 1:24000). Additional geographic coordinates for the Project route are located in Appendix E- Geographic Coordinates.

Additional Site Information

The Project is not located in Indian Country.

This Project is not considered a federal facility.

UPDES Project or Permit Tracking Number

UTR363463 **This will be the number assigned to the Project by the Utah Department of Environmental Quality (UDEQ) after application under the Utah Pollutant Discharge Elimination System (UPDES) General Permit.*

1.2 Contact Information / Responsible Parties

RMP has contracted EC Source Services (ECS) to provide Engineering, Procurement, and Construction (EPC) services for the Project. T&D Power, Inc. (TDP) will be the Prime Contractor onsite. Stormwater Pollution Prevention Plan (SWPPP) implementation and inspection services are to be performed by Energy Environmental Group, Inc. (EEG).

For the Project, the following responsibilities have been delineated.

- Submit Notice of Intent (NOI) – ECS
- Development of the SWPPP – ECS and EEG
- Selection of Best Management Practices (BMPs) – ECS and EEG
- Installation and Maintenance of BMPs – EEG
- Inspections and Reports – EEG

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- Maintenance of the SWPPP, including site maps – EEG
- Notice of Termination (NOT) submittal – ECS

EPC Contractor:

EC Source Services
Larry Kahl, Senior Vice President Project Management
Milford Operating Facility
1341 Utah 257
Milford, UT 84751
Office Number: (480) 245-7221
Cell Number: (480) 694-7187
Efax Number: (480) 463-4733

Construction Contractor:

T&D Power, Inc.
Joe Stone, Construction Manager
Milford Operating Facility
1341 Utah 257
Milford, UT 84751
Office Number: (480) 245-7221
Cell Number: (307) 202-1178
Efax Number: (480) 463-4733

SWPPP Contractor:

Energy Environmental Group, Inc.
Sid Strauss, President
4143 E. Quartz Circle, Suite 104
Mesa, Arizona
Office Number: (480) 218-9711
Cell Number: (480) 297-8762
Fax Number: (480) 218-9715

Site Contact Person:

Energy Environmental Group, Inc.
Bryan Watt, Lead Environmental Inspector
Milford Operating Facility
1341 Utah 257
Milford, UT 84751
Office Number: (480) 245-7221
Cell Number: (435) 671-1585
Efax Number: (480) 463-4733

Alternate Site Contact Person:

EC Source Services
Dave Teichert, Environmental Superintendent
Milford Operating Facility
1341 Utah 257
Milford, UT 84751
Office Number: (480) 245-7221
Cell Number: (832) 289-6536
Efax Number: (480) 463-4733

SWPPP Prepared By:

EC Source Services
Debbie Greenacre, Vice President Environmental Management Services
Intermountain West Regional Headquarters
3280 N Hwy 36
Rush Valley, UT 84069
Office Number: (480) 254-7221
Cell Number: (480) 253-2951
Fax Number: (480) 218-9715

Energy Environmental Group, Inc.
Tori Gruenewald, Environmental Scientist
Intermountain West Regional Headquarters
3280 N Hwy 36
Rush Valley, UT 84069
Office Number: (480) 254-7221
Cell Number: (480) 253-2951
Fax Number: (480) 218-9715

Emergency 24-Hour Contact:

Energy Environmental Group, Inc.
Bryan Watt, Project Environmental Scientist/Utah Registered Stormwater Inspector
Milford Operating Facility
1341 Utah 257
Milford, UT 84751Office Number: (435) 866-3174
Cell Number: (435) 671-1585
Efax Number: (480) 463-4733

Emergency Alternate Contact:

Energy Environmental Group, Inc.
Rain Gmuer-Johnson, Certified Stormwater Inspector
Richfield Operating Facility
1345 S 350 W
Richfield, UT 84701
Cell Number: (435) 503-5592

Emergency Alternate Contact:

Energy Environmental Group, Inc.
Kari Kerwin, Utah Registered Stormwater Inspector
Enterprise Operating Facility
5200S & Utah State Hwy 18, Enterprise, UT 84725
Cell Number: (435) 253-3035

1.3 Nature and Sequence of Construction Activity

The Project is a linear utility project whose purpose is to deliver electrical power and address system reliability to customers in the RMP service area. The estimated Project start date is 1 May 2013 with an estimated Project completion date of 15 May 2020 at final stabilization.

The following permanent facilities will be installed to construct this Project.

- Approximately 170 miles of new single-circuit 345kV alternating current (AC) transmission line from the terminal bay at the existing Sigurd Substation to the terminal bay at the existing Red Butte Substation
- 673 tubular steel, 2 footed (small number of 3 footed), H-Frame Structures with direct embedded footings utilizing engineered backfill
- 121 lattice steel, 4 footed, self-supporting deadend towers anchored in reinforced concrete, cast-in-place drilled piers utilizing stub angels
- 1 Fiber optic regeneration station located at the existing Milford Substation
- Improvements to existing roads and construction of permanent and temporary access roads as shown on SWPPP Volume II Map Set I
- Installation or rerouting of gates and fences as needed for construction access
- Construction of temporary ancillary multi-use construction laydown yards for material storage, temporary office locations, concrete batch plants, and helicopter assisted operations
- Stringing of a single circuit 345kV overhead transmission line (including shield wires, conductors, and insulators) between the Sigurd Substation and Red Butte Substation

Construction activities and approximate timeframes follow:

Phase	Activity	Date
Phase I	Preconstruction Survey and Site Specific Planning	1 February 2013- 15 October 2014
Phase II	Installation of Stormwater controls, Clearing and Vegetative Management	1 May 2013 – 15 October 2014
Phase III	Access Roads and Pad Site Construction	7 May 2013 – 15 November 2014
Phase IV	Foundation Excavation	14 May 2013 – 1 August 2014
Phase V	Structure Assembly and Erection	28 May 2013 – 1 Sept 2014
Phase VI	Wire Installation	1 August 2013 – 1 October 2014
Phase VII	Final Grading, Cleanup, and Restoration	1 Sept 2013 – 15 November 2014
Phase VIII	Seeding for Permanent Stabilization	1 September 2013 – 15 December 2014
Phase IX	Removal of Temporary BMPs	1 June 2014 – May 2020

The layout of the Project is shown on SWPPP Volume II Map Set 1. Soil disturbing activities during construction will consist primarily of clearing, grubbing, access road and worksite grading, foundation excavation, and final grading for restoration.

Additionally, a copy of the construction schedule is located in Appendix F- Project Schedule.

1.4 Soils, Slopes, Vegetation, and Current Drainage Patterns

<u>Soil Types</u>

Soils within the Project area are variable due to parent materials, topography, and other factors that affect the distribution and formation of these soils. A total of 125 soil units occur in the Project area and are identified on the table below. This soils analysis was prepared by Environmental Planning Group (EPG) as part of the Wetland and Other Waters Delineation Report completed during the U.S. Army Corps of Engineers (USACE) Section 404 process. ECS has included with this assessment the USGS listed K-factor for each soil unit. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Values for K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

The Wetland and Other Waters Delineation Report for this Project will be maintained at the Project office with this SWPPP. In general, the soils on plateaus, mesas, hillsides, and fan terraces range from very shallow to deep and are generally well drained. In these areas, the water erosion potential is typically slight to moderate, while wind erosion potential is often moderate to severe. On the valley floors the soils range from very shallow to deep and are typically gravelly, sandy, or loamy with caliche in the subsurface. The erosion potential is slight to moderate and typically increases with greater slope.

Overall, with the implementation of Project mitigation measures and BMPs, erosion and sedimentation impacts are expected to be low.

Additional information regarding subsurface soils can also be found in the 2011 Geotechnical Report prepared by Shaw Environmental & Infrastructure Inc. located in Appendix G- Geotechnical Report.

WETLAND AND OTHER WATERS DELINEATION REPORT APPENDIX G – SOILS OCCURING IN THE STUDY AREA					
Area Symbol	**Code**	**Soil Map Unit Name**	**County**	**Hydric Rating**	**K Factor**
UT628	102	Amtoft-Rock outcrop complex, 15 to 60 percent slopes	Sevier	Not Hydric	0.07
UT628	107	Annabella cobbly sandy loam, 5 to 20 percent slopes	Sevier	Partially Hydric	0.07
UT628	140	Hiko Peak very cobbly sandy loam, 5 to 30 percent slopes, extremely bouldery	Sevier	Not Hydric	0.25
UT628	141	Hiko Peak-Annabella complex, 5 to 30 percent slopes	Sevier	Not Hydric	0.25
UT628	144	Hiko Peak-Saxby-Rock outcrop association, 30 to 70 percent slopes	Sevier	Not Hydric	0.07
UT628	145	Hiko Peak-Tarnach-Rock outcrop association, 4 to 45 percent slopes	Sevier	Not Hydric	0.3
UT628	159	Kapture-Sigurd-Stillman complex, 2 to 5 percent slopes	Sevier	Not Hydric	0.11

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UT628	168	Medburn-Glenwood fine sandy loams, 2 to 5 percent slopes	Sevier	Not Hydric	0.11
UT628	193	Rock outcrop-Tiki-Amtoft complex, 15 to 75 percent slopes	Sevier	Unknown Hydric	0.13
UT628	197	Sanpete very cobbly sandy loam, 4 to 15 percent slopes, very bouldery	Sevier	Not Hydric	0.04
UT628	206	Stillman-Sigurd complex, 2 to 8 percent slopes	Sevier	Not Hydric	0.11
UT634	304	Annabella very gravelly loam, 2 to 15 percent slopes	Sevier	Partially Hydric	0.15
UT634	309	Ashdown loam, 2 to 5 percent slopes	Sevier	Not Hydric	0.37
UT634	323	Berent loamy fine sand, 0 to 10 percent slopes	Sevier	Not Hydric	0.32
UT634	325	Beryl sandy loam, 2 to 5 percent slopes	Sevier	Not Hydric	0.2
UT634	334	Bullion silt loam, 0 to 2 percent slopes	Sevier	Not Hydric	0.55
UT634	336	Bullion-Antelope Springs complex, 0 to 2 percent slopes	Sevier	Not Hydric	0.55
UT634	346	Checkett gravelly loam, 5 to 40 percent slopes	Sevier	Not Hydric	0.17
UT634	348	Checkett-Rock outcrop complex, 8 to 25 percent slopes	Sevier	Not Hydric	0.24
UT634	349	Chuska-Checkett gravelly loams, 8 to 25 percent slopes	Sevier	Not Hydric	0.2

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UT634	370	Dixie gravelly loam, 2 to 8 percent slopes	Sevier	Not Hydric	0.32
UT634	375	Escalante sandy loam, 0 to 5 percent slopes	Sevier	Not Hydric	0.24
UT634	376	Escalante sandy loam, 1 to 5 percent slopes	Sevier	Not Hydric	0.24
UT634	407	Lucero-Checkett complex, 15 to 40 percent slopes	Sevier	Not Hydric	0.05
UT634	413	Manselo-Ashdown complex, 0 to 5 percent slopes	Sevier	Not Hydric	0.24
UT634	417	Medburn sandy loam, 0 to 2 percent slopes	Sevier	Not Hydric	0.24
UT634	467	Rock outcrop	Sevier	Not Hydric	0.05
UT634	476	Sevy sandy loam, 0 to 2 percent slopes	Sevier	Not Hydric	0.13
UT634	477	Sevy sandy loam, 2 to 8 percent slopes	Sevier	Not Hydric	0.28
UT634	479	Sevy-Taylorsflat complex, 2 to 8 percent slopes	Sevier	Not Hydric	0.37
UT634	482	Skumpah silt loam, 0 to 2 percent slopes	Sevier	Partially Hydric	0.55
UT634	489	Taylorsflat loam, 0 to 2 percent slopes	Sevier	Not Hydric	0.43
UT634	491	Taylorsflat loam, saline, 0 to 5 percent slopes	Sevier	Not Hydric	0.37
UT634	504	Wales loam, 0 to 2 percent slopes	Sevier	Partially Hydric	0.37
UT634	507	Wales sandy loam, 0 to 2 percent slopes	Sevier	Not Hydric	0.32

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UT634	509	Wales very fine sandy loam, 0 to 2 percent slopes	Sevier	Not Hydric	0.37
UT634	516	Woodrow silty clay loam, saline, 0 to 2 percent slopes	Sevier	Not Hydric	0.43
UT640	AND2	Antelope Springs-Kessler association, 1 to 10 percent slopes	Sevier	Not Hydric	0.3
UT640	BLE	Blackett-Blue Star association, 3 to 20 percent slopes	Sevier	Not Hydric	0.24
UT640	DeB	Decca loam, 1 to 3 percent slopes	Sevier	Not Hydric	0.32
UT640	ECD2	Escalante sandy loam, 2 to 10 percent slopes, eroded	Sevier	Not Hydric	0.28
UT640	ESD2	Escalante-Hiko Peak complex, 2 to 10 percent slopes, eroded	Sevier	Not Hydric	0.28
UT640	Et	Etta loam	Sevier	Not Hydric	0.28
UT640	Ev	Etta clay, heavy variant	Sevier	Not Hydric	0.28
UT640	FGC2	Flowell gravelly loam, 3 to 6 percent slopes, eroded	Sevier	Not Hydric	0.2
UT640	HHD	Haybourne coarse sandy loam, 1 to 10 percent slopes	Sevier	Not Hydric	0.13
UT640	HIF	Hiko Peak coarse sandy loam, 3 to 30 percent slopes	Sevier	Partially Hydric	0.17
UT640	KPE	Kessler-Penoyer association, 1 to 20 percent slopes	Sevier	Not Hydric	0.1
UT640	MaB	Manderfield loam, 1 to 3 percent slopes	Sevier	Not Hydric	0.3

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UT640	MaC	Manderfield loam, 3 to 6 percent slopes	Sevier	Not Hydric	0.3
UT640	MNF	Mill Hollow-Pharo association, 2 to 30 percent slopes	Sevier	Not Hydric	0.1
UT640	MPG	Mineral Mountain extremely rocky loam, 30 to 60 percent slopes	Sevier	Not Hydric	0.05
UT640	MRG2	Mineral Mountain-Snake Hollow association, 3 to 60 percent slopes, eroded	Sevier	Not Hydric	0.05
UT640	MT	Mine wash	Sevier	Not Hydric	0.05
UT640	PGB	Penoyer silt loam, 1 to 3 percent slopes	Sevier	Not Hydric	0.43
UT640	POF2	Phage-Black Ridge association, 3 to 30 percent slopes, eroded	Sevier	Not Hydric	0.1
UT640	SEF	Sheeprock-Cokel complex, 3 to 30 percent slopes	Sevier	Not Hydric	0.05
UT640	SKE	Sigurd gravelly loam, 3 to 15 percent slopes	Sevier	Not Hydric	0.15
UT640	SLD	Snake Hollow coarse sandy loam, 3 to 10 percent slopes	Sevier	Not Hydric	0.2
UT640	SLD2	Snake Hollow coarse sandy loam, 3 to 10 percent slopes, eroded	Sevier	Not Hydric	0.07
UT641	MOG	Motoqua-Rock outcrop complex, 30 to 70 precent slopes	Sevier	Not Hydric	0.05
UT641	Lb	Lavate sandy loam	Sevier	Not Hydric	0.24

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UT649	105	Anco-Kirkham complex, 0 to 1 percent slopes	Sevier	Not Hydric	0.24
UT649	109	Atepic-Rock outcrop complex, 10 to 50 percent slopes	Sevier	Not Hydric	0.55
UT649	117	Christianburg silty clay loam, strongly saline, 0 to 1 percent slopes	Sevier	Not Hydric	0.32
UT649	122	Denmark-Sanpete complex, 2 to 10 percent slopes	Sevier	Not Hydric	0.04
UT649	140	Hiko Peak very cobbly sandy loam, 5 to 30 percent slopes, extremely bouldery	Sevier	Not Hydric	0.05
UT649	141	Hiko Peak-Annabella complex, 5 to 30 percent slopes	Sevier	Not Hydric	0.15
UT649	145	Hiko Peak-Tarnach-Rock outcrop association, 4 to 45 percent slopes	Sevier	Not Hydric	0.2
UT649	154	Jodero loam, 0 to 2 percent slopes	Sevier	Not Hydric	0.04
UT649	159	Kapture-Sigurd-Stillman complex, 2 to 5 percent slopes	Sevier	Not Hydric	0.1
UT649	167	May Day gravelly silt loam, 2 to 8 percent slopes	Sevier	Not Hydric	0.38
UT649	168	Medburn-Glenwood fine sandy loams, 2 to 5 percent slopes	Sevier	Not Hydric	0.18
UT649	173	Naser silt loam, 0 to 2 percent slopes	Sevier	Not Hydric	0.49

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UT649	175	Okerland clay loam, 0 to 2 percent slopes	Sevier	Not Hydric	0.3
UT649	176	Parkay-Faim-Wallsburg complex, 10 to 50 percent slopes	Sevier	Not Hydric	0.18
UT649	183	Povertyflat very cobbly loam, 3 to 15 percent slopes	Sevier	Not Hydric	0.13
UT649	191	Redfield silt loam, 1 to 3 percent slopes	Sevier	Not Hydric	0.38
UT649	208	Torriorthents-Xeric Haplogypsids association, 5 to 35 percent slopes	Sevier	Not Hydric	0.37
UT626	103	Manselo sandy loam, 0 to 3 percent slopes	Beaver	Not Hydric	0.24
UT626	104	Uvada-Playas complex, 0 to 2 percent slopes	Beaver	Partially Hydric	0.49
UT626	105	Pyrat-Garbo, gravelly surface complex, 1 to 5 percent slopes	Beaver	Not Hydric	0.24
UT626	106	Dixie-Garbo complex, 3 to 8 percent slopes	Beaver	Not Hydric	0.24
UT626	107	Bandag loam, 0 to 2 percent slopes	Beaver	Not Hydric	0.37
UT626	108	Thermosprings silt loam, 0 to 3 percent slopes	Beaver	Partially Hydric	0.49

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UT626	109	Harding-Berent association	Beaver	Partially Hydric	0.55
UT626	114	Hiko Peak gravelly loam, 3 to 8 percent slopes	Beaver	Not Hydric	0.15
UT626	115	Woodrow, slightly saline-Blue Star complex, 0 to 5 percent slopes	Beaver	Partially Hydric	0.43
UT626	116	Hiko Peak-Crestline complex, 3 to 8 percent slopes	Beaver	Not Hydric	0.15
UT626	124	Garbo-Biblesprings-Manselo, strongly alkaline complex, 0 to 5 percent slopes	Beaver	Not Hydric	0.24
UT626	126	Manselo, moderately saline-Thermosprings complex, 0 to 5 percent slopes	Beaver	Not Hydric	0.24
UT626	128	Harding silt loam, 0 to 2 percent slopes	Beaver	Not Hydric	0.55
UT626	134	Heist-Crestline, thick surface complex, 0 to 5 percent slopes	Beaver	Not Hydric	0.07
UT626	137	Escalante sandy loam, 3 to 15 percent slopes	Beaver	Not Hydric	0.24
UT626	139	Thermosprings-Taylorsflat, moderately saline-Kunzler complex 0 to 2 percent slopes	Beaver	Not Hydric	0.43
UT626	147	Woodrow, moderately saline-Musinia, moderately saline-Playas association	Beaver	Partially Hydric	0.43

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UT626	149	Riverwash-Medburn association	Beaver	Partially Hydric	0.43
UT626	152	Drum-Taylorsflat, moderately saline association	Beaver	Not Hydric	0.49
UT626	163	Taylorsflat sandy loam, 2 to 5 percent slopes	Beaver	Not Hydric	0.28
UT626	167	Crestline sandy loam, 3 to 8 percent slopes	Beaver	Not Hydric	0.1
DixieNF	10	Kolob - Ashfork families complex, 3 to 30 percent slopes	Washington	Unknown	0.3
DixieNF	12	Bodacious - Pioche families complex, 20 to 60 percent slopes	Washington	Unknown	0.3
DixieNF	17	Motoqua - Showalter families association, 20 to 60 percent slopes	Washington	Unknown	0.3
DixieNF	18	Bernal - Muzzler - Mokiak families complex, 15 to 60 percent slopes	Washington	Unknown	0.18
DixieNF	23	Mokiak, deep - Motoqua families complex, 0 to 20 percent slopes	Washington	Unknown	0.18
DixieNF	26	Draper - Wineg families association, 0 to 15 percent slopes	Washington	Unknown	0.18
DixieNF	28	Wye - Nehar families complex, 20 to 40 percent slopes	Washington	Unknown	0.3
DixieNF	29	Wye - Nehar families complex, 10 to 20 percent slopes	Washington	Unknown	0.3

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DixieNF	30	Bernal - Pastorius - Dalcan families association, 30 to 80 percent slopes	Washington	Unknown	0.38
DixieNF	34	Kolob - Dalcan - Detra families complex, 3 to 35 percent slopes	Washington	Unknown	0.18
DixieNF	3	Bookcliff - Bernal - Mokiak families complex, 20 to 60 percent slopes	Washington	Unknown	0.18
DixieNF	I304	Anabella very gravelly loam, 2 to 15 percent slopes	Washington	Unknown	0.18
DixieNF	I309	Ashdown loam, 2 to 5 percent slopes	Washington	Unknown	0.18
DixieNF	I349	Chuska - Checkett gravelly loams, 8 to 25 percent slopes	Washington	Unknown	0.3
SOURCE: Natural Resources Conservation Service 2011c					

Slopes

Pre-existing

The Project area is located within the Central Basin and Range Level III Ecoregion (Woods et al. 2001). Area mountain ranges include the Mineral Mountains, Pahvant Range, Tushar Mountains, Pine Valley Mountains, the Wah Wahs, and Indian Peak Mountain. The western portion of the Project area lies in the Escalante Desert. Project elevations range from approximately 5,000 feet above mean sea level in the northern valleys to over 7,000 feet above mean sea level. Topographic elevations can be found on the SWPPP Volume II Map Set 1 and POD Map Set 2.

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During Construction

A safe, level working area will be required at each work site for foundation, structure, and wire installation. In addition, access roads will be constructed, where needed and permissible, to each work area. Where topography and slope exceed safe access and working levels, cut and fill methods will be utilized. At these locations, disturbance will be minimized to the extent necessary to perform the work. Those sites identified within the Project POD as helicopter assist/low impact vehicle sites will be constructed using alternative construction methods. As such, work areas will be adjusted to meet the minimum work area needed to safely perform the work. After construction is complete, all temporary work sites and access roads will be re-contoured and reclaimed to the greatest extent possible. Structure locations, planned work site locations, and access roads are shown on the SWPPP Volume II Map Set 1 and POD Map Set 2.

Post Construction

Permanent access roads will be required for long-term maintenance activities. Permanent access roads to be constructed or improved are shown on SWPPP Volume II Map Set 1 and POD Map Set 2. These access roads will be constructed to PacifiCorp's Transmission Construction Standards to include those through steep terrain. Please reference Appendix R- PacifiCorp's Transmission Construction Standards for more information.

Where approved, a permanent work area at the base of each structure will be constructed for long-term maintenance activities. The work area will be level with a slope no greater than 3 percent. Revegetation could occur in this work area and the area would be re-contoured to the greatest extent possible. The dimensions of this work area will vary by structure type but could be as large as the temporary work area used during construction.

Drainage Patterns

Drainage patterns within the Project area collect in several area creeks and follow site topographical patterns. Because of the semi-arid climate, most of the drainage channels convey little or no stream flow for long periods of time during the year.

Drainage along the flanks of the Pahvant Mountains collects in several area creeks, which generally flow from south to north, and end up in the Sevier River. Along the eastern side of the Pahvant Mountains, drainage collects in several area creeks that generally run from west to east. In other areas, the natural drainage is primarily overland runoff that generally flows from west to east. Drainage within this basin region ultimately discharges into Sevier Lake.

Vegetation

Vegetation within the Project area has been consolidated into the following vegetation communities: Conifer/Woodlands (Zone 1), Shrub-lands (Zone 2), Grasslands (Zone 3), Wetlands/Riparian and Playa (Zone 4). Per the POD, the classification of vegetation communities in the Project area was based on geographic information system (GIS) data obtained from the Southwest Regional Gap Analysis Project (GAP).

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These vegetation communities are shown on SWPPP Volume II POD Map Set 2 as Reclamation Zones 1 through 4. Please note that select areas of the Project have been impacted by wildfire. Wildfire impacted areas are identified on the SWPPP Volume II POD Map Set 2 as Reclamation Subzone 1.

Descriptions of the four vegetation communities follow.

Zone 1: Conifer/Woodlands

Zone 1 (Conifer/Woodlands) consists of an aggregation of aspen, pinyon-juniper, and ponderosa pine. This zone is typically composed of coniferous and deciduous trees and woody plants, with a limited grass understory. This zone will typically range from approximately 4,400 to 8,000 feet in elevation, and receive approximately 10-25" of rainfall per year. Vegetation communities are detailed below.

Aspen

Aspen habitat consists of the GAP Rocky Mountain aspen forest and woodland land cover categories. This community occurs in montane areas and is dominated by quaking aspen (*Populus tremuloides*) with less than 25 percent conifer species. The understory vegetation generally includes a complex shrub-herb community or a simple herbaceous layer. Primary shrub species include snowberry (*Symphoricarpos* spp.), thimbleberry (*Rubus parviflorus*), Saskatoon serviceberry (*Amerlanchier alnifolia*), and kinnikinnick (*Arctostaphylos uva-ursi).*

Pinyon-Juniper

Pinyon-Juniper vegetation communities consists of the GAP Colorado plateau pinyon-juniper woodland, Great Basin pinyon-juniper woodland, and recently chained pinyon-juniper land cover types. These communities occur on dry, mid-elevation foothills and mountain slopes. Utah juniper (*Juniperus osteosperma*) and pinyon pine *(Pinus monophylla* and *P. edulis*) represent the dominant tree species. Common understory species include Greenleaf Manzanita (*Arctostaphylos patula*), antelope bitterbrush (*Purshia tridentata*), sagebrush (*Artemisia* spp.), mountain mahogany (*Cercocarpus intricatus* and *C. montanus*), oaks (*Quercus* spp.), Stansbury's cliffrose (*Purshia mexicana*), and various grasses.

Ponderosa Pine

This vegetation community occurs on a wide variety of slopes and aspects commonly with moderate to steep slopes, rocky areas with good soil aeration and drainage, and periods of drought during the growing season. Ponderosa pine (*Pinus ponderosa*) is the predominant conifer with juniper (*Juniperus* spp.) often present in the tree canopy. The understory is usually shrubby, dominated by sagebrush and Gambel oak. Muhlygrasses (*Muhlenbergia* spp.), and blue grama (*Bouteloua gracilis*) are common grasses.

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Zone 2: Shrub-lands

Zone 2 (Shrub-Lands) consists of an aggregation of big sagebrush, desert shrub, mountain shrub, and shrub steppe areas. The zone is typically composed of a variety of low, shrubby and woody vegetation, with a limited to moderate grass understory. This zone will typically range from approximately 4,400 to 8,000 feet in elevation, and receives approximately 7 to 20 inches of rainfall annually. Vegetation communities are detailed below.

Big Sagebrush

Big sagebrush habitat consists of the GAP inter-mountain basins big sagebrush shrubland cover type. This community occurs on well-drained, nonalkaline soils at middle elevations and is dominated by basin big sagebrush (*Artemisia tridentata spp. tridentata*) and Wyoming big sagebrush *Artemisia tridentata ssp. wyomingensis*). Typical codominant species include antelope bitterbrush (*Purshia tridentata*), yellow rabbitbrush (*Chrysothamnus viscidiflorus*), and rubber rabbitbrush (*Chrysothamnus nauseosa*).

Desert Shrub

Desert shrub habitat consists of the GAP inter-mountain basins greasewood flat and inter-mountain basins mixed salt desert shrub land cover types. These represent open-canopied shrub communities that occur on alkaline soils in desert basins. Greasewood flat is typically dominated by greasewood with saltbush (*Atriplex* spp.), sagebrush (*Artemisia* spp.), and winterfat (*Krascheninnikovia lanata*). Salt desert shrub is typically dominated by one or more species of saltbush, including shadscale saltbush (*Atriplex confertifolia*), fourwing saltbush (*Atriplex canescens*), cattle saltbush (*Atriplex polycarpa*), and spinescale saltbush (*Atriplex spinifera*). Common codominant species include Wyoming big sagebrush, yellow rabbitbrush, rubber rabbitbrush, winterfat, Mormon tea (*Ephedra nevadensis*), and spiny hopsage (*Grayia spinosa*).

Mountain Shrub

Mountain shrub habitat consists of the GAP mogollan chaparral and Rocky Mountain Gambel oak-mixed montane shrubland land cover types. Mogollan chaparral is associated with xeric, coarse-textured substrates on foothills and mountain slopes. Dominant species include shrub live oak (*Quercus turbinella*), Toumey oak (*Quercus toumeyi*), mountain mahogany (*Cercocarpus montanus*), desert ceanothus (*Ceanothus greggii*), and Stansbury cliffrose (*Purshia stansburiana*). This community occurs in the Bull Valley Mountains northwest of the Red Butte Substation. Gambel oak-mixed montane shrubland occurs on more mesic habitats. Vegetation is dominated by Gambel oak (*Quercus gambelii*) alone or codominant with antelope bitterbrush, serviceberry (*Amelanchier* spp.), and chokecherry (*Prunus virginiana*). This community occurs on mid-elevation slopes in the Tushar Mountains, Mineral Mountains, and Bull Valley Mountains.

Shrub Steppe

Shrub steppe habitat consists of the GAP Colorado plateau mixed low sagebrush shrubland, Great Basin zeric mixed sagebrush shrubland, inter-mountain basins montane sagebrush steppe, and inter-mountain basins semi-desert shrub steppe land cover types. These communities occur on relatively xeric sites with

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shallow, rocky, nonsaline soils. While specific species composition varies, common dominant shrub species include sagebrush (*Artemisia nova*, *A. arbuscula*, and *A. bigelovii*), rabbitbrush, Mormon tea, broom snakeweed (*Gutierrezia sarothrae*), and semi-arid grasses such as bluebunch wheatgrass (*Pseudoroegneria spicata*), Indian ricegrass (*Achnatherum hymenoides*), desert needlegrass (*Hesperostipa comata).*

Zone 3: Grasslands

Zone 3 (Grasslands) consists of an aggregation of native grassland and invasive grassland areas. This zone is typically composed of a variety of low, abundant grasses, both native and exotic. This zone is typically found in both valley and montane environments randing from 4,400 to 8,000 feet in elevation and receives approximately 15 to 25 inches of rainfall annually. Vegetation communities are detailed below.

Native Grassland

Grassland habitat consists of the GAP southern Rocky Mountain montane-subalpine grassland land cover type. This vegetation community typically occurs on flat to gently rolling topography at higher elevations. This habitat often consists of a mosaic of several plant associations with a dominant bunch grass, such as an oatgrass (e.g., *Danthonia intermedia* and *Danthonia parryi*), fescue (e.g., *Festuca idahoensis*, *F. arizonica*, and *F. thurberi*), or slimstem muhly (*Muhlenbergia filiculmis*).

Invasive Grassland

The invasive vegetation community consists of the GAP invasive annual and biennial forbland, invasive annual grassland, and invasive perennial grassland land cover types. This habitat is dominated by invasive non-native species, including cheatgrass (*Bromus tectorum*), smooth brome (*Bromus inermis*), Kentucky bluegrass (*Poa pratensis*), halogeton (*Halogeton glomeratus*), kochia (*Kochia prostrata*), and Russian thistle (*Salsola spp*.).

Zone 4: Riparian

Zone 4 (Riparian) is composed of only riparian areas and consist of stream channel and vegetated banks with woody overstory vegetation**.** Riparian habitats typically are associated with perennial and intermittent drainages. Within the Project area, the majority of this habitat includes Pinto and Little Pinto creeks, the Beaver, Sevier, and Santa Clara rivers and their associated reservoirs and tributaries.

Riparian

Riparian communities occur along small creeks and small springs, with the specific community type and species composition dependent on elevation and hydrological characteristics. Typical species in lower elevation shrub riparian habitats include: tamarisk (*Tamarix* spp.), Russian olive (*Elaeagnus angustifolia*), willow (*Salix* spp.), and red osier dogwood (*Cornus stolonifera*). Typical species in higher elevation, forest riparian communities include: box elder (*Acer negundo*), bigtooth maple (*Acer grandidentatum*), water birch (*Betula occidentalis*), narrowleaf cottonwood (*Populus angustifolia*), and Engelmann spruce (*Picea engelmannii*).

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Additional Information

Agriculture

Agriculture habitat consists of both irrigated and nonirrigated agricultural lands. This vegetation community occurs in the Sevier River Valley and the Milford-Minersville area.

Barren/Sparsely Vegetated

Barren/sparsely vegetation habitat includes the GAP inter-mountain basins playa land cover type and occurs at lower elevations in the Escalante Desert. This community includes barren or sparsely vegetated playas (less than 10 perfect plant cover) that are intermittently flooded. Characteristic plant species include inland saltgrass (*Distichlis spicata*), iodinebush (*Allenrolfea occidentalis*), greasewood (*Sarcobatus verminsulatus*), sickle saltbush (*Atriplex falcata*), pickleweed (*Salicornia europeae*), spiny hopsage (*Grayia spinosa*), and basin wildrye (*Laymus cinereus*).

Noxious Weeds

The Utah Noxious Weed Act defines noxious weeds as "any plant the commissioner determines to be especially injurious to public health, crops, livestock, land, or other property". The State of Utah currently classifies 27 plant species as noxious weeds. The following species have been identified in the Project area:

- Black henbane (*Hyoscyamus niger*)
- Diffuse knapweed (*Centaurea diffusa*)
- Leafy spurge (*Euphorbia esula*)
- Spotted knapweed (*Centaurea masculosa*)
- Hoary cress (*Cardaria draba*)
- Musk thistle (*Carduus nutans*)
- Scotch thistle (*Onopordum acanthium*)
- Field bindweed (*Convolvulus arvensis*)
- Houndstongue (*Cynoglossum officinale*)
- Saltcedar (*Tamarix ramossissima*)
- Bull thistle (*Cirsium vulgare*)

Please note that a Noxious Weed Management Plan has been developed for this Project and is located in Appendix B10-Noxious Weed Management Plan of the POD. This plan outlines the mitigation measures and protective stipulations that will be implemented on the Project for the control of noxious weeds.

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1.5 Construction Site Estimates

Project Land Requirements

A permanent 150-foot wide right-of-way (ROW) has been acquired by RMP for the Project. Additional features to the Project include:

- ROW access roads (temporary and permanent) as shown on Project maps; and
- Off-ROW material storage yards/staging areas as identified in Section 1.1 of this plan.

The following table, taken from the Project POD, displays disturbance estimates for the Project.

TABLE A3-3
SUMMARY OF GROUND DISTURBANCE AND VEGETATION CLEARING

	Temporary Disturbance (acres)[1, 4]	Permanent Disturbance (acres)[2, 4]	Total Disturbance (acres)[4]	Right-of-way Vegetation Clearing (acres)[3, 4]
Total for selected route	**1,608.8**	**508.4**	**2,117.2**	**938.1**

NOTES:
[1]Temporary disturbance: Estimated area of disturbance associated with structure work areas (not including base area); wire splicing sites, wire pulling sites, wire tensioning sites, multi-use construction yards, staging areas, helicopter refueling sites, guard structures, and temporary access roads (refer to Table 3-1).
[2]Permanent disturbance: Estimated area of disturbance associated with H-frame and lattice structure base areas, communication regeneration stations and associated fiber optic and power lines, and permanent access roads (refer to Tables 3-2 and 3-3).
[3]Right-of-way vegetation clearing: Vegetation clearing was estimated for the full area of the right-of-way and the area of tree clearing outside of the right-of-way associated with temporary and permanent access roads and other temporary and permanent Project facilities where vegetation communities within the right-of-way only. Calculations include vegetation types with the potential to grow 12 feet tall (aspen, mountain shrub, pinyon-juniper, and riparian) occur.
[4]A 5 percent contingency has been added to the total calculated acreage.

The total estimated area of disturbance Project wide is 2,117.2 acres. Of this 1,608.8 acres is estimated to be temporary disturbance and 508.4 acres is estimated to be permanent disturbance. The areas to be disturbed are described further below.

Structure Work Sites

A work area at the base of each structure is required for construction activities. In order to provide a safe working space, the work area must be level with a slope no greater than 3 percent. The dimensions of this work area will vary by structure type and onsite physical and environmental conditions. Typically, a temporary disturbance area of approximately 150 feet x 200 feet (0.69 acres) is assumed for each non-

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lattice structure work area, and a temporary disturbance area of 250 feet x 250 feet (1.43 acres) for each lattice structure work area.

Within the work areas described above, the permanent disturbance associated with the tower footings will be up to 40 square feet for H-frame structures, 80 square feet for lattice deadend structures, and 116 square feet for three-pole running angle structures.

Wire Stringing Sites

Wire string sites will typically be 150 feet x 750 feet for the Project. However, when construction occurs in steep and rough terrain, these sites may require larger, less symmetrical areas. Disturbance has been estimated at approximately 2.59 acres per site.

Wire Splicing Locations

During wire stringing operations, splicing of the conductor wires will be necessary. This work often occurs mid-span between structures unless site or environmental conditions warrant the use of implosive sleeves. Where wire splicing activities occur, additional access and worksites may be required. A temporary work area of approximately 100 feet x 100 feet (0.23 acres) is estimated for each wire splicing work area.

Guard Structure Work Areas

Temporary guard structure work areas will typically be 75 feet x 150 feet in dimension, more when the transmission line meets the obstacle at an angle. Disturbance has been approximated at 0.26 acres per work area.

Existing Access Roads

Existing access roads will be utilized to the greatest extent possible during construction. A percentage of these roads do not require improvement, however, in some cases, repairs and/or improvements may be necessary to provide safe access for vehicles, equipment, and materials. More information on existing roads identified for Project use can be found in SWPPP Volume II Map Set 1 and POD Map Set 2.

New Access Roads (Temporary and Permanent)

In some areas, only temporary roads will be needed. Typically, these temporary roads will be graded to a standard travel-surface width of approximately 14 feet. In areas of steeper terrain, the travel-surface width could be a maximum of 22 feet for curves in the road, dependent on site-specific conditions. Normally, a ditch drainage system will not be constructed for temporary roads. Temporary roads are shown on the SWPPP Volume II Map Set 1 and POD Map Set 2 and will be reclaimed after construction.

Permanent access roads will be constructed where needed for construction and/or long-term maintenance, or where landowners or land-managing agencies require road construction. Permanent roads will be graded to a travel-surface width of approximately 14 feet. In areas of steeper terrain, the travel-surface width could be a maximum of 22 feet for curves in the road, dependent on site-specific

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conditions. These access roads will be constructed to PacifiCorp's Transmission Construction Standards. Please reference Appendix R- PacifiCorp's Transmission Construction Standards for more information. In general, access roads follow the natural grade of area terrain with a typical slope of up to 10 percent.

Turnout areas may be required along access roads so that vehicles and equipment may safely pass. Turnouts will be approximately 100 feet x 10 feet wide and will be located about every 1,000 feet along the road.

Multi-Use Construction Yards / Support Facilities

Multi-use construction yards and other support facilities will be located within proximity to the Project. This will include construction yards, helicopter support sites and staging areas. Activities within these areas may include the following: temporary batch plant locations; administrative offices; vehicle and equipment parking; fueling and maintenance areas; and material storage. These facilities will range in size from approximately 5 to 20 acres per site.

Additional Construction Site Estimates

The calculated percentage of impervious area before construction is 0.43%
The calculated runoff coefficient before construction is 0.07

The calculated percentage of impervious area after construction is 0.74%
The calculated runoff coefficient after construction is 0.19

1.6 Water Resources

As described within the POD, only low impacts on water resources will be anticipated in the northern Project area. The mitigation of any high or moderate impacts can be attributed to spanning riparian areas or avoiding ground-disturbing activities that would remove soil-stabilizing vegetation in riparian areas such as at Dry Creek. Avoiding surface-disturbing activities on steep slopes like those occurring in the Dry Hollow area, where the potential for increased erosion following ground disturbance or removal of vegetation exists, also would reduce impacts.

In the southern project area, the selected route is located within the Upper Virgin Watershed, which contains a state-listed impaired water (Santa Clara River) that has the potential for being affected by construction and maintenance activities. Ground disturbance related to the construction and maintenance of the transmission line could potentially increase erosion in disturbed areas and reduce permeability of soils where compacted, potentially contributing to an increased level of total dissolved solids, salinity, chlorides, and selenium being discharged into the Santa Clara River. If not avoided or mitigated, this potentially could exceed effluent limits set by the EPA. However, with implementation of planned mitigation, most effects on state-listed impaired waters, as well as the municipal and agricultural needs of citizens living downstream, will be avoided and/or mitigated to acceptable levels.

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Receiving Waters

A Wetland and Other Waters Delineation Report was prepared for the Project by EPG. This report contains a comprehensive list of wetlands and stream crossings that intersect the Project Route to include perennial, intermittent, and ephemeral streams. A copy of this report will be maintained and available for review at Project office locations with the SWPP.

Springs and Wells

Six springs and twelve wells have been identified within 600 feet of the Project ROW. Phillips 9-1 Well and Utah State 31-33 Well are approximately 300 feet from the centerline at Links 349 and 66, respectively. CalEnergy 28-3 Well is approximately 2,500 feet from the centerline at Link 75. Irvine Spring is approximately 13,000 feet from the centerline at Link 260. There are an additional three unnamed wells located at Links 365, 386, and 430 and one unnamed spring at Link 444 within the Project area. Springs and wells are also shown on the SWPPP Volume II Map Set 1 and POD Map Set 2.

Reservoirs, Lakes, and Ponds

During the FEIS process, several reservoirs, lakes, and ponds exist within the Project area. Large reservoirs in the Project area include Rock Ford Reservoir, Piute Reservoir, Three Creek Reservoir, Minersville Reservoir, Grass Valley Reservoir, and Newcastle Reservoir. Typically, natural lakes are found at higher elevation, where the cooler climate reduces the amount of water lost to evaporation and snowmelt is retained in semi-impermeable basins. Examples of natural lakes in the Project area include Duck Lake, Deep Lake, Hunts Lake, Barney Lake, Puffer Lake, Birch Lake, and Kent's Lake. Other man-mad lakes, ponds, and small reservoirs are found in the Project area, and are typically used for agricultural purposes. These include Taylor Pond, Moscow Reservoir, Sand Pond, Mound Pond, and Danish Reservoir.

Impaired Water bodies

As previously referenced, the Santa Clara River, a state-listed impaired water, is located within the Project area. The Santa Clara River is located approximately 1.7 miles southeast of the Red Butte Substation.

Municipal Storm Sewer Systems (MS4s)

No known municipal Storm Sewer Systems (MS4s) occur along the Project.

1.7 Site Features and Sensitive Areas

Unique features and sensitive areas within the Project will include soil resources, water resources, biological resources, natural vegetation, wildlife species, and other environmentally sensitive areas. These areas and sites are identified on the SWPPP Volume II Map Set 1 and POD Map Set 2.

To protect and minimize impacts to these resources a series of Project mitigation measures have been selected and will be implemented on the Project. Tables identifying Project standard mitigation

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measures and Project selective mitigation measures can be found in Appendix H- Project Mitigation Tables. Appendix H includes Table 5-3 from the POD which provides milepost to milepost locations of where the selective mitigation measures are applied.

1.8 Summary of All Potential Pollutant Sources

Potential pollutant sources that may reasonably be expected to affect the quality of stormwater discharges, other than sediment, are listed on the following table.

Storage of materials will primarily be at the material and construction support yards identified in Section 1.1 Some materials will also be located on maintenance vehicles and work truck for as needed maintenance along the ROW. The appropriate BMPs will be implemented to limit any pollutants from mixing with stormwater and potentially being discharged off the Project. On-site fueling will occur. All areas were fueling is prohibited are specifically identified on SWPPP Volume II Map Set 1 and POD Map Set 2. One dedicated mobile batch plant will be utilized on the Project. This batch plant will be operated at multiple construction support yards and approved work area locations on the Project.

Potential pollutant sources are also addressed within the POD and the Project Hazardous Materials Management Program (HMMP). The mitigation measures and stipulations contained within these plans will be implemented throughout the Project. A copy of these plans will be located at all Project offices.

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Potential Pollutant	Comments
Sediments	Caused by ground disturbing activities and erosion. BMPs will be installed and maintained throughout the Project until final stabilization is achieved.
Fuels	Used by vehicles and equipment on site. Secondary containment will be provided as necessary to contain leaks and spills. Spill response materials will be located on all vehicles.
Oils	Used by vehicles and equipment on site. Drip pans will be utilized when changing oil. Spill response materials will be located on all vehicles.
Grease and other lubricants	Used by some vehicles and equipment. Will be contained in staging areas or on vehicles in minimal amounts.
Trash	Trash to be contained and removed frequently.
Concrete Curing Compound	Will properly store on site. Weather will be monitored to reduce the chance of chemicals entering stormwater.
Concrete Wash Water	Contained onsite in designated areas.
Soil Stabilizers	Will properly store on site. Weather will be monitored to reduce the chance of chemicals entering stormwater.
De-Watering	Will be pumped out on to vegetated area, dissipation device, or filter device to contain sediment.
Sanitary/Septic Waste	Portable toilets will be contained on-site and secured to avoid tipping. All services will be performed by a Licensed Sanitary Company.
Solvents	Will be properly stored, used, and disposed of. Storage areas will be inspected regularly.
Stains or Paints	Will be properly stored, used, and disposed of. Storage areas will be inspected regularly.
Glues and Adhesives	Will be properly stored, used, and disposed of. Storage areas will be inspected regularly.
Fertilizers	Will be properly stored, used, and disposed of. Storage areas will be inspected regularly.
Pesticides	Will be properly stored, used, and disposed of. Storage areas will be inspected regularly.

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1.9 Endangered Species Certification

Special Status Wildlife Species

During Project permitting, a number of biological and avian resource inventories were performed for special status wildlife species that have the potential to occur in the Project area. Special status wildlife species include those species listed as threatened, endangered, or candidate under the Endangered Species Act (ESA); classified as sensitive by the state of Utah, BLM, or USFS; and/or identified as Management Indicator Species by the USFS.

As discussed within the Project POD, the Project route crosses habitats mapped by the Utah Division of Wildlife Resources (UDWR) as crucial sage-grouse brood-rearing and winter habitat. Additionally, field surveys were performed to identify greater sage-grouse leks (2010 and 2012), dark kangaroo mouse habitat (2012), and raptor nests (2012), as well as Utah prairie dog (2010), pygmy rabbit (2012), and kit fox (2012) burrows. These field surveys were performed by EPG, the BLM's third party contractor. The following POD table identifies those wildlife species analyzed during the FEIS and field surveys.

TABLE B6-1
SPECIAL STATUS AND USFS MANAGEMENT INDICATOR SPECIES LIKELY TO OCCUR IN THE PROJECT AREA

Common Name	Scientific Name	Likelihood of Occurrence
Special Status Species		
American white pelican	*Pelecanus erythrorhynchos*	Transients may occur – no preconstruction surveys performed
Arizona toad	*Bufo microscaphus*	May occur – no preconstruction surveys performed
Bald eagle	*Haliaeetus leucocephalus*	Likely to occur – no active nests detected during preconstruction surveys; winter roosting may occur
Bonneville cutthroat trout	*Oncorhynchus clarki utah*	Known to occur – no preconstruction surveys performed
Burrowing owl	*Athene cunicularia*	Known to occur – active nests detected during preconstruction surveys
California Condor	*Gymnogyps californianus*	Not likely to occur – no preconstruction surveys performed
Cutthroat trout	*Oncorhynchus clarki*	Known to occur – no preconstruction surveys performed
Dark kangaroo mouse	*Microdipodops megacephalus*	Likely to occur – potentially suitable habitat detected during preconstruction surveys
Desert Sucker	*Catostomus clarki*	May occur – no preconstruction surveys performed
Ferruginous hawk	*Buteo regalis*	Known to occur – active nests detected during preconstruction surveys
Greater sage-grouse	*Centrocercus urophasianus*	Known to occur – active lek detected during preconstruction surveys and an incidental observation of a single sage-grouse hen was recorded near the town of Newcastle in 2012
Kit fox	*Vulpes macrotis*	Known to occur – active den detected in Project area in 2010; however, no active dens detected along the selected route during kit fox surveys in 2012
Long-billed curlew	*Numenius americanus*	Likely to occur – no preconstruction surveys performed
Peregrine falcon	*Falco peregrinus anatum*	Known to occur – single active nest detected during 2012 surveys within 0.5 mile of selected route; no active nest detected in 0.5 to 1.0 mile of selected route
Pygmy rabbit	*Brachylagus idahoensis*	Not likely to occur – no individuals detected during

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TABLE B6-1
SPECIAL STATUS AND USFS MANAGEMENT INDICATOR SPECIES LIKELY TO OCCUR IN THE PROJECT AREA

Common Name	Scientific Name	Likelihood of Occurrence
		preconstruction surveys
Short-eared owl	*Asio flammeus*	Known to occur – individuals observed during preconstruction surveys
Southern leatherside chub	*Lepidomeda aliciae*	May occur – no preconstruction surveys performed
Spotted bat	*Euderma maculatum*	Likely to occur – breeding and foraging habitat present
Townsend's big-eared bat	*Corynorhinus townsendii*	Likely to occur – breeding and foraging habitat present
Utah prairie dog	*Cynomys parviden*	Not likely to occur – no colonies detected during surveys conducted for Section 7 consultation
Western toad	*Bufo boreas*	May occur – no preconstruction surveys performed
USFS Management Indicator Species		
Black-throated grey warbler	Dendroica nigrescens	Likely to occur - no preconstruction surveys performed
Brewer's sparrow	*Spizella breweri*	Likely to occur – no preconstruction surveys performed
Brown trout	*Salmo trutta*	Known to occur – no preconstruction surveys performed
Hairy woodpecker	*Picoides villosus*	Likely to occur – no preconstruction surveys performed
Lincoln's sparrow	*Melospiza lincolnii*	Likely to occur – no preconstruction surveys performed
MacGillivray's warbler	*Oporornis tolmiei*	May occur – no preconstruction surveys performed
Macroinvertebrates	Multiple species	Known to occur – no preconstruction surveys performed
Mountain bluebird	*Sialia currucoides*	Likely to occur – no preconstruction surveys performed
Mule deer	*Odocoileus hemionus*	Known to occur – no preconstruction surveys performed
Northern flicker	*Colaptes auratus*	Likely to occur – no preconstruction surveys performed
Northern goshawk	*Accipiter gentilis*	May occur – no nesting habitat but may forage in Project area
Rainbow trout	*Oncorhynchus mykiss*	Known to occur – no preconstruction surveys performed
Rocky Mountain elk	*Cervus canadensis*	Known to occur – no preconstruction surveys performed
Sage thrasher	*Oreoscoptes montanus*	Likely to occur – no preconstruction surveys performed
Song sparrow	*Melospiza melodia*	Likely to occur – no preconstruction surveys performed
Vesper sparrow	*Pooecetes gramineus*	Likely to occur – no preconstruction surveys performed
Virgin spinedace	*Lepidomeda mollispinis*	Known to occur – no preconstruction surveys performed
Western bluebird	*Sialia mexicana*	Likely to occur – no preconstruction surveys performed
Wild turkey	*Meleagris gallopavo*	Likely to occur – no preconstruction surveys performed
Yellow warbler	*Dendroica petechia*	Likely to occur – no preconstruction surveys performed

It should also be noted that there is the potential for the southwestern willow flycatcher (Empidonax traillii extimus), a federally listed endangered species, to occur within the Project area. However, no occurrences of the southwestern willow flycatcher were noted during preconstruction surveys.

Special Status Plant Species

Special status plant species include species listed as threatened, endangered, or candidates under the ESA; classified as sensitive by the BLM or USFS; and identified as Management Indicator Species by the

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USFS. Field surveys were performed in 2011 and 2012 by EPG to identify occurrences of USFS and BLM sensitive plants along the selected route. Sensitive plant locations were mapped and are shown on SWPPP Volume II Map Set 1 and POD Map Set 2. The following table identifies those sensitive plant species that were identified during field surveys.

TABLE B6-2
SPECIAL STATUS PLANTS WITH LIKELIKHOOD OF OCCURRENCE ALONG THE PROJECT ROUTE

Common Name	Scientific name	Likelihood of Occurrence
Pink egg milkvetch	*Astragalus oophorus* var. *lonchocalyx*	Not likely to occur – no individuals or suitable habitat detected during preconstruction surveys
Welsh milkvetch	*Astragalus welshii*	Not likely to occur – no individuals or suitable habitat detected during preconstruction surveys
Mound cryptanth	*Cryptantha compacta*	Not likely to occur – no individuals or suitable habitat detected during preconstruction surveys
Nevada willowherb	*Epilobium nevadense*	Not likely to occur – no individuals or suitable habitat detected during preconstruction surveys
Elsinore buckwheat	*Eriogonum batemanii* var. *ostlundii*	Known to occur – detected during preconstruction surveys
Wirestem buckwheat	*Eriogonum pharnaceoides* var. *cervinum*	Not likely to occur – no individuals or suitable habitat detected during preconstruction surveys
Spoon-leaf buckwheat	*Eriogonum spathulatum* var. *kayeae*	Not likely to occur – no individuals or suitable habitat detected during preconstruction surveys
Franklin's penstemon	*Penstemon franklinii*	Not likely to occur – no individuals or suitable habitat detected during preconstruction surveys
Pinyon penstemon	*Penstemon pinorum*	Not likely to occur – no individuals or suitable habitat detected during preconstruction surveys
Ward's penstemon	*Penstemon wardii*	Known to occur – detected during preconstruction surveys
Jones globemallow	*Sphaeralcea caespitosa* var. *caespitosa*	Not likely to occur – no individuals or suitable habitat detected during preconstruction surveys
Sigurd townsendia	*Townsendia jonesii var. lutea*	May occur – unoccupied potentially suitable habitat detected during preconstruction surveys
Utah phacelia	*Phacelia utahensis*	Not likely to occur – no individuals or suitable habitat detected during preconstruction surveys

The purpose of the Plant and Wildlife Species Conservation Measures Plan is assist the BLM, USFS, and Project personnel in meeting their obligations to protect biological resources (i.e., wildlife, plants, and habitats) during the planning, design, and implementation of the Project. The Plant and Wildlife Species Conservation Measures Plan provides guidance on specific biological concerns associated with the Project and identifies the mitigation measures, stipulations, protocols, and/or techniques required to minimize impacts to biological resources. Please refer to Appendix I- Plant and Wildlife Species Conservation Measures Plan for further information.

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1.10 Historic Properties

For this Project, a Class III cultural resource inventory was completed by EPG to identify, record, and determine the extent and significance of identified cultural resources within the Project area. Areas where historic properties are located are designated as "Environmentally Sensitive Areas" on Project maps, but are not defined for protective reasons. Further information is contained with the FEIS, the Project Programmatic Agreement, and Historic Properties Treatment Plan (HPTP). A copy of the HPTP will be maintained by Project Archeologist and other authorized personnel.

The HPTP prescribes specific treatment for specific sites identified through Class III cultural surveys conducted for the project. These treatment methods will be implemented prior to construction, during construction, and post construction. Also identified in the HPTP are the protocols to be taken in the instance of an unanticipated discovery.

1.11 Applicable Federal, State, and Local Programs

As applicable, this SWPPP will incorporate by reference the appropriate elements of plans required by other agencies. The SWPPP will be updated as necessary to remain consistent with any revisions.

USACE Nationwide Permit Summary 12

This Project is covered under the USACE Nationwide Permit Summary Number 12. Work performed on this Project will comply with the general terms and conditions of the permit and BMPs will be implemented and maintained on site to preclude construction materials and/or activities from adversely affecting any waters of the United States beyond the scope of those authorized.

PacifiCorp has completed the terms of the USACE preconstruction notification and provided notice of this activity to ECS on 21 February 2013. The Project will not result in any permanent impacts greater than 0.10 acre.

Stream Alteration Permit

The Stream Alteration Program (Rule R655-13) is regulated by the Utah Division of Water Rights. The purpose of this rule is to clarify the procedures necessary in order to obtain approval by the state engineer for any Project that proposes to alter a natural stream within the state of Utah.

All stream crossings associated with this Project will be evaluated for regulation under the Stream Alteration Program. As needed, the appropriate plans, applications, and fees will be submitted to the UDEQ Division of Water Rights for approval. Stream alteration permits for this Project will be obtained prior to performing the jurisdictional work covered under this rule.

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UDEQ Division of Water Rights Main Office

1594 West North Temple, Suite220
Salt Lake City, UT 84114
Phone: (801) 538-7240

Stream Alteration Specialist
Chuck Williamson
Phone: (801) 538-7404

1.12 Maps

This SWPPP will contain a series of site maps (located in Volume II and Volume III of the SWPPP), which will be completed to scale and will show the entire Project to identify the following:

- The direction of stormwater flow and the approximate slopes that are anticipated after major grading activities;
- Areas of soil disturbance;
- Areas that will not be disturbed;
- Natural features to be preserved;
- Locations of major structural and non-structural BMPs;
- Location of stabilization measures;
- Locations of any off-site material, waste, burrow, or equipment storage areas;
- Locations of all waters of the United States, including wetlands;
- Locations where stormwater discharges to a surface water;
- Locations of storm drain inlets; and
- Areas where final stabilization has been accomplished.

Construction sites will be evaluated prior to construction in coordination with the Project Compliance Inspection Contractor (CIC). BMPs will be updated on Project Maps to include the Site Specific Environmental Plans (SSEP) located in Volume III of the SWPPP. Sequencing of events is discussed in Section 2.2 of the SWPPP.

Maps included with this SWPPP are as follows:

1. <u>Location Maps</u>

   A Project location map, along with construction support facility location maps, is located in Attachment D- Facility Location and Site Maps.

2. <u>SWPPP Volume II – SWPPP Map Set 1 and POD Map Set 2</u>

   SWPPP Map Set 1 is a dynamic map set which includes map panels that illustrate the location of project features at a fixed scale of 1:8500, or 1” = 708’ for the entire alignment. Features included in this map set are the location of tower sites, ROW, transmission line centerline, multi-use

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construction yards, staging areas, substation locations, access routes, environmentally sensitive areas, and various environmental geographic elements. This map set will be utilized to show the location of ECS environmental BMPs along Project access roads.

POD Map Set 2 includes panels that show (1) the ROW in detail, including the specific location of facilities and sensitive environmental resource areas in the immediate vicinity, and (2) key mitigation measures to be implemented during the design, construction, and operation of the transmission line.

3. SWPPP Volume III – Site Specific Environmental Plans

Information contained on the SSEPs include site drainage patterns, erosion and sediment control BMPs, site disturbance limits, sensitive area/resource data, proximate surface water bodies, locations of environmental exclusion zones, material stockpile information, and seeding information.

SWPPP maps will be updated and amended throughout the Project to adequately reflect past, present, and future planned construction and SWPPP activities.

SECTION 2: EROSION AND SEDIMENT CONTROL BMPS

This SWPPP will describe all BMPs that will be implemented to control pollutants in storm water discharges. For every major activity identified in this SWPPP, appropriate control measures will be described along with the general implementation sequence. All BMPs will be properly selected, installed, and maintained as per the manufacturers' specifications and good engineering practices. If inspections or information indicates a BMP has been used inappropriately, incorrectly, or is ineffective, it will be replaced or modified.

The sequence of major construction activities found in Section 1.3 outlines the schedule to implement the proposed erosion and sediment control devices. Appendix J- Best Management Practices contains information and guidelines for the placement of sediment control barriers, stabilization practices, good housekeeping procedures, and other BMPs. The BMP's in Appendix J were obtained from the Salt Lake County Public Works Department.

All sediment/perimeter control BMPs will be installed at work sites as shown on Project SWPPP maps and SSEPs. Temporary BMPs will not be removed until final stabilization is achieved except when temporary structures must be removed in order to allow construction activities to continue. The decision to remove a BMP will be made by the appropriate SWPPP team member. In these cases, the SWPPP will be modified and amended to implement protective measures to ensure continued protection from pollutant discharges.

2.1 Minimize disturbed area and protect natural features and soil

The overall approach toward erosion control on this Project is to minimize ground disturbance and enable native vegetation to re-emerge and permanently stabilize the construction areas against erosion.

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Construction work areas, approved roads, and areas for avoidance will be identified on maps and identified in the field through the use of signs, flagging and/or fencing. In addition, the following mitigation measures will be implemented to protect sensitive Project features:

- Construction disturbance limits will be minimized to the extent feasible.
- Existing roads will be utilized to the extent feasible and as approved through Project easements and permitting.
- Grading will be minimized by driving overland within pre-designated work areas whenever possible.
- Vegetation shall be left in place where feasible to preserve root structures and provide increased opportunity for resprouting.
- To minimize ground disturbance, construction traffic routes will be clearly marked with temporary markers such as easily visible flagging.
- Topsoil from excavations shall be stockpiled separately from other soil material and salvaged for reclamation activities.
- As identified on site maps, selective removal of vegetation (i.e., trees) within and along the edges will be performed.
- Avoidance of disturbance to sensitive resources (i.e., streams, riparian areas, trails, etc.) will be performed to the greatest extent possible. Supplemental erosion and sediment control devices will be installed at these crossings where necessary to further protect these resources.
- Natural vegetation buffers will be left in place wherever possible and in particular, at stream crossings.
- As shown on site maps, helicopter supported construction will be performed in selected areas and will further reduce construction impacts.

Additionally, the construction schedule may be modified to minimize construction activities in rain soaked or muddy conditions. Existing roads and trails would be used for travel to the maximum extent feasible unless otherwise authorized. During wet road conditions, any ruts deeper than 4 inches remaining on Project roads would be repaired at the Authorized Officer's discretion.

2.2 Phase Construction Activity

Phase I - Preconstruction Survey and Site Specific Planning
(1 February 2013 – 15 Oct 2014)

Prior to clearing and construction, environmental scientists, monitors, and construction planners will access the ROW to evaluate project environmental and POD requirements. At this time, SSEPs will be developed and the information will be incorporated into Project plans. Project monitoring requirements and Cultural Resource treatment activities will also be conducted along with the installation of construction signage, flagging, and buffer fencing. Project constructability surveys, preconstruction geotech, and transmission line surveys will also be performed.

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Phase II - Installation of Stormwater Controls, Work Area/Access Road Clearing, and Vegetation Management
(1 May 2013 – 15 Oct 2014)

During Phase II, environmental work crew(s) will install BMPs as directed by SSEPs. This will include the installation of sediment control devices such as mulch berms, silt fence, straw wattles, rock berms, and stabilized construction entrances. Temporary stream crossings along with other identified BMPs will also be installed at this time.

Trees and other vegetation will be removed selectively (e.g. edge feathering) to blend the edge of the ROW into adjacent vegetation patterns, as practicable and appropriate. Trees will be selectively removed in riparian habitats and in the Great Basin Desert to protect biological resources. Mechanical tree clearing methods will involve the use of equipment such as chain saws, weed trimmers, rakes, shovels, brush hooks, and mowers to clear vegetation. Mowing will be pursued whenever practical and will be limited to within the transmission ROW, work areas, and access road delineations. Clearing efforts in heavy growth areas will use a Hydro-Ax excavator mounted brush mower or similar equipment. Hand clearing methods will also be utilized in areas of sensitivity such as the Project identified Inventoried Roadless Area.

Vegetation Management activities will be performed in accordance with the Project's Vegetation Management Plan and the POD. A copy of these plans will be maintained in the Project office along with the SWPPP.

Phase III – Access Roads and Pad Site Construction
(7 May 2013 – 15 Nov 2014)

During Phase III, access roads and pad sites will be constructed. Sediment and erosion control measures installed during the construction phase may include, but not necessarily be limited to, waterbars, drainage ditches, dissipation devices, and culverts. BMP's for access roads and pad sites will be identified on SWPPP Volume II Map Set 1 and on SWPPP Volume III SSEPs.

Phase IV – Foundation Excavation
(14 May 2013 – 1 Aug 2014)

During Phase IV, foundations will be constructed for the lattice steel self-supporting steel-lattice structures. Footings will primarily be excavated using track mounted or rubber tired drill rigs.

Work activities during this phase will be maintained within the established pad sites constructed during Phase III. These sites will be monitored and inspected to ensure all installed BMPs and mitigation measures are implemented and are working effectively. If inspections indicate that a BMP is ineffective, it will be replaced or modified.

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Phase V – Structure Assembly and Erection
(28 May 2013 – 1 Sept 2014)

Assembly and erection will be performed via both conventional crane and helicopter methods as indicated on the SWPPP Volume II Map Set 1 and POD Volume II. Assembly will occur either at the designated structure site or at a preapproved assembly yard.

Work activities at these locations will be maintained within established work sites. These sites will be monitored and inspected to ensure all installed BMPs and mitigation measures are implemented and are working effectively. If inspections indicate that a BMP is ineffective, it will be replaced or modified.

Phase VI – Wire Installation
(1 Aug 2013 – 1 Oct 2014)

Primary wire stringing operations will be performed at prearranged puller and tensioning sites. Sediment and erosion control measures at these locations may include, but are not necessarily limited to, silt fences, straw wattles, seeding, and mulching. These sites will be monitored and inspected to ensure all installed BMPs and mitigation measures are implemented and are working effectively. If inspections indicate that a BMP is ineffective, it will be replaced or modified.

***Phase VII* – Final Grading, Cleanup, and Restoration**
(1 Sept 2013 – 15 November 2014)

Cleanup and restoration activities along the ROW, material yards, and other construction related areas, will be performed on an ongoing basis and phased throughout the Project as construction activities are completed. This will include tower site locations, pull sites, sleeving sites, staging areas, material yards, maintenance yards, and temporary office locations. These activities will follow the requirements and stipulations of Appendix B14- Reclamation, Revegetation, and Monitoring Framework Plan. Activities will include, but are not limited to, the following.

Final cleanup and restoration activities will include the following:

- Access roads will be restored to landowner and regulatory authority satisfaction
- Excess material left onsite will be relocated or disposed of at approved locations
- Construction facilities will be removed or returned
- All project related materials will be removed to include all temporary fences and gates, temporary poles, guard poles, anchors and guys etc.
- Storage tanks will be removed
- Temporary construction pads will be return to preconstruction grade or left in place for future maintenance needs
- All ruts will be repaired
- All work generated trash and debris will be removed
- All construction staking, flagging and fencing will be removed, unless requested by the client to remain in place

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- Work sites will be graded to landowner, regulatory authority and permit satisfaction
- Topsoil salvaged during grading operations will be spread onsite

Work activities and BMPs will continue to be monitored and inspected at these locations to ensure effectiveness. If inspections indicate that a BMP is ineffective, it will be replaced or modified.

Phase VIII - Seeding for Permanent Stabilization
(1 Sept 2013 – 15 Dec 2014)

Temporary work sites and other disturbed areas, such as access road cuts and fills, that have been disturbed to the point where re-emergence of native vegetation is not considered likely will be seeded with a native seed mix. An exception to this is if the landowner or land manager requests an alternative seed mixture. Overall, native vegetation will be the primary approach to final (permanent) stabilization.

Phase IX - Removal of Temporary BMPs
(1 June 2014 – 5 May 2020)

Temporary BMPs will be removed once site conditions, at each location, have met final stabilization requirements as identified in Section 7 of this SWPPP. The Project will continue to be monitored and inspected as per the SWPPP and UPDES Permit until final stabilization requirements are met and an NOT has been submitted.

2.3 Control Stormwater flowing onto and through the Project

This Project will use structural controls to help divert the flow of stormwater from exposed soils, retain or detain flows, or otherwise limit runoff and the discharge of pollutants from the exposed areas of the site. Controls for controlling stormwater flows onto and through the Project will include the use of diversion berms, ditches, check dams, and waterbars.

2.4 Stabilize Soils

The General Permit requires stabilization measures to be initiated on disturbed surface areas as soon as practicable, but no more than 14 days after construction activity has either temporarily or permanently ceased on any portion of the construction site. There are 2 exceptions to this requirement.

- Stabilization does not need to be initiated when construction activities will resume on a portion of the site within 14 days from the suspension of previous construction activities.

- Stabilization does not need to be initiated when construction activities have been precluded by snow cover or frozen ground conditions within 14 days from the suspension of previous construction activities. Stabilization measures shall occur as soon as practicable.

EEG will identify any interim and permanent stabilization practices for the site, including a schedule of when the stabilization practices will be implemented. This SWPPP will identify where existing vegetation is to be preserved in the SSEPs. The Project will primarily utilize permanent seeding with native vegetation to permanently stabilize exposed soils at the close of the Project.

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EEG will maintain records that show the dates when major grading activities occur, the dates when construction activities temporarily or permanently cease, and the dates when stabilization measures are initiated.

The following temporary stabilization measures have been identified for this Project. Slopes will be protected with hydraulic mulch, geotextiles/mats, temporary seeding with sterile oats or rye, soil binders, site compaction, or a combination of erosion control practices to limit rill, gully, and channel erosion. Areas that are generally flat with no slope will be temporarily stabilized with wood mulch, straw mulch, hydro-seeding, binders, site compaction, or a combination of erosion control practices to limit sheet flow erosion on flat areas.

EEG will be responsible for seeding the Project area upon completion of construction. Permanent seeding methods will consist primarily of drill seeding with alternative methods, such as hydroseeding or broadcast seeding in areas where conditions do not allow for drill seeding (e.g. steep, rocky or remote sites).

Seed selection will be based on site-specific conditions and landowner or land manager requirements. Native species will be given preference pending seed availability, cost, and chance of success. Seed mixes and application rates may also be modified to achieve site-specific weed management objectives. Agency-approved seed mixes can be found in POD Appendix B14 – Reclamation, Revegetation, and Monitoring Framework Plan, and are shown below.

TABLE 2
REVEGETATION SEED MIXTURE 1A – RICHFIELD FIELD OFFICE
(Pinyon-Juniper, Sagebrush/Shadscale/Grass Steppe – Precipitation Less Than Eight Inches)

Common Name	Scientific Name	Quantities
Luna Pubescent Wheatgrass	*Thinopyrum intermedium 'Luna'*	1.00
Bozoisky Russian Wildrye	*Psathyrostachys juncea*	2.00
Trailhead Great Basin Wildrye	*Leymus cinereus'Trailhead'*	1.50
Sand Dropseed	*Sporobolus cryptandrus*	0.50
Alkali Sacaton	*Sporobolus airoides*	0.50
Covar Sheep Fescue	*Festuca ovina 'Covar'*	1.50
Northern Sweetvetch	*Hedysarum boreale*	1.50
White Sweetclover	*Melilotus albus*	0.50
Small Flower Globemallow	*Sphaeralcea parvifolia*	0.50
Showy Blanketflower	*Gaillardia aristita*	0.50
Cedar Palmer Penstemon	*Penstemon palmeri*	0.50
Appar Lewis Flax	*Linum lewisii (L. perenne)*	1.50
Common Sunflower	*Helianthus annuus*	2.00
Yellow Beeplant	*Cleome lutea*	0.50
Sagebrush (whichever species is dominant)	*Artemisia sp.*	0.50
Forage Kochia	*Kochia sp.*	1.00
	TOTAL	**16.00**

NOTE: Application rates in pounds per acre of pure live seed

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ECS Project No. 11-051
Contract No. 3000091215
PacifiCorp Sigurd – Red Butte
345kV Transmission Line Project

TABLE 3
REVEGETATION SEED MIXTURE 1B – RICHFIELD FIELD OFFICE
(Pinyon-Juniper, Big Sagebrush Steppe, Mountain Browse – Precipitation Eight Inches or More)

Common Name	Scientific Name	Quantities
Sandberg Bluegrass (High Plains Variety)	*Poa secunda* J. Presl.	1.00
Luna Pubescent Wheatgrass	*Thinopyrum intermedium 'Luna'*	1.00
Bozoisky Russian Wildrye	*Psathyrostachys juncea*	2.00
Magnar Great Basin Wildrye	Leymus cinereus 'Magnar'	1.50
Covar Sheep Fescue	*Festuca ovina 'Covar'*	1.50
Gooseberry Leaf Globemallow	*Sphaeralcea grossulariifolia*	0.50
Yellow Sweetclover	*Melilotus officinalis*	0.50
Delar Small Burnet	*Sanguisorba minor 'delar'*	1.00
Richfield Firecracker Penstemon	*Penstemon eatonii*	0.50
Palmer Penstemon	*Penstemon palmeri*	0.50
Rocky Mountain Beeplant	*Cleome serrulata*	0.50
Appar Lewis Flax	*Linum lewisii (L. perenne)*	1.00
Common Sunflower	*Helianthus annuus*	2.00
Sagebrush (whichever species if dominant)	*Artemisia sp.*	0.50
Forage Kochia	*Kochia sp.*	1.00
Fourwing Saltbush	*Atriplex canescens*	1.00
	TOTAL	**16.00**

Note: Application rates in pounds per acre of pure live seed

TABLE 4
REVEGETATION SEED MIXTURE 2A – CEDAR CITY FIELD OFFICE
(Sagebrush Shrub and Pinyon-Juniper Woodland Communities – Lower Elevations <6,000 feet)

Common Name	Scientific Name	Quantities
Crested Wheatgrass – Ephraim	*Agropyron cristatum 'Ephraim'*	1.0
Intermediate Wheatgrass	*Thinopyrum intermedium*	2.0
Lincoln Smooth Brome	*Bromus inermis 'Lincoln'*	2.0
Pubescent Wheatgrass	*Thinopyrum intermedium*	1.0
Needle-and-Thread	*Hesperostipa comata*	2.0
Indian Ricegrass – Nezpar	*Achnatherum hymenoides 'Nezpar'*	2.0
Alfalfa-Ladak	*Medicago sativa 'Ladak'*	1.00
Small Burnet	*Sanguisorba minor*	1.00
Utah Sweetvetch	*Hedysarum boreale*	1.00
Western Yarrow	*Achillea millefolium var. occidentalis*	0.50
Yellow Sweetclover	*Melilotus officinalis*	1.00
Lewis Flax	*Linum lewisii*	1.00
Globemallow	*Sphaeralcea sp.*	1.00
Palmer Penstemon	*Penstemon palmeri*	1.00
Four-wing Saltbush	*Atriplex canescens*	1.00
Wyoming Sagebrush	*Artemisia tridentata* ssp. *wyomingensis*	0.50
	TOTAL	**20.00**

NOTES:

- Mixture 2A provides the recommended seeding mixture and rate for the re-vegetation of sagebrush shrub. The exact seeding mixture may differ depending on seed availability. Sagebrush was included to mitigate visual and wildlife habitat impacts, although this species may invade the right-of-way from adjacent habitats rapidly. Any other changes should first be cleared with the appropriate Utah BLM field office.

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TABLE 5
REVEGETATION SEED MIXTURE 2B – CEDAR CITY FIELD OFFICE
(Sagebrush Shrub and Pinyon-Juniper Woodland Communities – Upper Elevations >6,000 feet)

Common Name	Scientific Name	Quantities
Crested Wheatgrass – Ephraim	*Agropyron cristatum 'Ephraim'*	1.00
Intermediate Wheatgrass	*Thinopyrum intermedium*	1.00
Lincoln Smooth Brome	*Bromus inermis 'Lincoln'*	2.00
Bluebunch Wheatgrass	*Pseudoroegneria spicata*	2.00
Needle-and-Thread	*Hesperostipa comata*	2.00
Indian Ricegrass – Nezpar	*Achnatherum hymenoides 'Nezpar'*	2.00
Alfalfa-Ladak	*Medicago sativa 'Ladak'*	1.00
Small Burnet	*Sanguisorba minor*	1.00
Yellow Sweetclover	*Melilotus officinalis*	1.00
Utah Sweetvetch	*Hedysarum boreale*	1.00
Lewis Flax	*Linum lewisii*	1.00
Globemallow	*Sphaeralcea sp.*	1.00
Palmer Penstemon	*Penstemon palmeri*	1.00
Antelope Bitterbrush	*Purshia tridentata*	1.00
Wyoming Sagebrush	*Artemisia tridentata* ssp. *wyomingensis*	0.50
Mountain Sagebrush	*Artemisia tridentata*	0.50
	TOTAL	**20.00**

NOTES:

- Mixture 2B provides the recommended seeding mixture and rate for the re-vegetation of sagebrush shrub. The exact seeding mixture may differ depending on seed availability. Sagebrush was included to mitigate visual and wildlife habitat impacts, although this species may invade the right-of-way from adjacent habitats rapidly. Any other changes should first be cleared with the appropriate Utah BLM field office.

TABLE 5
REVEGETATION SEED MIXTURE 2B – CEDAR CITY FIELD OFFICE
(Sagebrush Shrub and Pinyon-Juniper Woodland Communities – Upper Elevations >6,000 feet)

Common Name	Scientific Name	Quantities
Crested Wheatgrass – Ephraim	*Agropyron cristatum 'Ephraim'*	1.00
Intermediate Wheatgrass	*Thinopyrum intermedium*	1.00
Lincoln Smooth Brome	*Bromus inermis 'Lincoln'*	2.00
Bluebunch Wheatgrass	*Pseudoroegneria spicata*	2.00
Needle-and-Thread	*Hesperostipa comata*	2.00
Indian Ricegrass – Nezpar	*Achnatherum hymenoides 'Nezpar'*	2.00
Alfalfa-Ladak	*Medicago sativa 'Ladak'*	1.00
Small Burnet	*Sanguisorba minor*	1.00
Yellow Sweetclover	*Melilotus officinalis*	1.00
Utah Sweetvetch	*Hedysarum boreale*	1.00
Lewis Flax	*Linum lewisii*	1.00
Globemallow	*Sphaeralcea sp.*	1.00
Palmer Penstemon	*Penstemon palmeri*	1.00
Antelope Bitterbrush	*Purshia tridentata*	1.00
Wyoming Sagebrush	*Artemisia tridentata* ssp. *wyomingensis*	0.50
Mountain Sagebrush	*Artemisia tridentata*	0.50
	TOTAL	**20.00**

NOTES:

- Mixture 2B provides the recommended seeding mixture and rate for the re-vegetation of sagebrush shrub. The exact seeding mixture may differ depending on seed availability. Sagebrush was included to mitigate visual and wildlife habitat impacts, although this species may invade the right-of-way from adjacent habitats rapidly. Any other changes should first be cleared with the appropriate Utah BLM field office.

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TABLE 7
REVEGETATION SEED MIXTURE 2D – CEDAR CITY FIELD OFFICE
(Saline/Alkaline Wetland Communities)

Common Name	Scientific Name	Quantities
Shadscale Saltbrush	*Atriplex confertifolia*	3.00
Gardner Saltbush	*Atriplex gardneri*	3.00
Greasewood	*Sarcobatus vermiculatus*	4.00
Alkali Sacaton	*Sporobolus airoides*	2.00
Inland Saltgrass	*Distichlis spicata*	2.00
Forage Kochia	*Kochia sp.*	2.00
Tall Wheatgrass – Jose	*Thinopyrum ponticum'Jose'*	2.00
	TOTAL	**18.00**

NOTES:

- For wetland areas where the soils are considered saline and/or alkaline, the seeding mixture and rate listed in Mixture 2D will be used. Because of the potential high soil salinity/alkalinity in these areas, only plants that are tolerant of such conditions will be used for revegetation. During reclamation, soils that occur above the water table should be salvaged and used for the seedbed. The soils should be worked as little as possible after replacement to reduce compaction. However, seed and fertilizer should be raked or harrowed into the top 2 to 3 inches of the soil.
- Shrub species that are appropriate for transplanting to mitigate visual impacts of this vegetation type include rabbitbrush, shadscale, greasewood, and iodine bush. Rhizomes of inland saltgrass also can be transplanted to minimize visual concerns.

TABLE 8
REVEGETATION SEED MIXTURE 2E – CEDAR CITY FIELD OFFICE
(Desert Scrub and Blackbush Scrub Communities)

Common Name	Scientific Name	Quantities
Crested Wheatgrass	*Agropyron cristatum*	2.00
Indian Ricegrass–Nezpar	*Achnatherum hymenoides 'Nezpar'*	2.00
Galleta Grass	*Pleuraphis sp.*	1.00
Bottlebrush Squirreltail	*Elymus elymoides*	1.00
Sand Dropseed	*Sporobolus cryptandrus*	0.25
Lewis Flax	*Linum lewisii*	1.00
Gooseberry Leaf Globemallow	*Sphaeralcea grossulariifolia*	1.00
Palmer Penstemon	*Penstemon palmeri*	1.00
Western Yarrow	*Achillea millefolium* var. *occidentalis*	0.50
Alfalfa	*Medicago sativa*	0.50
Small Burnett	*Sanguisorba minor*	1.00
Forage Kochia	*Kochia sp.*	1.00
Four-wing Saltbush	*Atriplex canescens*	2.00
Winterfat	*Krascheninnikovia lanata*	1.00
	TOTAL	**15.25**

NOTES:

- Mixture 2E provides the seeding mixture and rate for the revegetation of desert scrub and blackbush scrub. The exact mix to be used may differ from the proposed mixture, depending on seed availability.
- Shrub species that are appropriate for transplanting to mitigate visual impacts of this vegetation type include bud sagebrush, fourwing saltbrush, big sagebrush, winterfat and greasewood.

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TABLE 9 REVEGETATION SEED MIXTURE 2F – CEDAR CITY FIELD OFFICE (Utah Greasewood Shrub Communities)		
Common Name	**Scientific Name**	**Quantities**
Tall Wheatgrass – Jose	*Thinopyrum ponticum'Jose'*	3.00
Crested Wheatgrass – Ephraim	*Agropyron cristatum 'Ephraim'*	1.00
Intermediate Wheatgrass – Oache	*Thinopyrum intermedium 'Oache'*	1.00
Thickspike Wheatgrass – Critana	*Elymus lanceolatus 'Critana'*	1.00
Red Fescue	*Festuca rubra*	1.00
Russian Wildrye – Vinall	*Psathyrostachys juncea 'Vinall'*	2.00
Fourwing Saltbush	*Atriplex canescens*	3.00
Forage Kochia	*Kochia sp.*	2.00
	TOTAL	**14.00**

- NOTE: The recommended revegetation seeding mixture and rate along the greasewood scrub vegetation type are listed in Mixture 2F. As discussed above, the exact seeding mixture to be used in this vegetation type may differ from the proposed mix, depending on the availability of the seed. Possible substitutions or additions include rabbitbrush, Gardner saltbrush, alkali sacaton, and basin wildrye.

Final reseeding will be conducted at the first appropriate growing season after completion of construction and reclamation. Seeding will be repeated until a satisfactory stand is established.

2.5 Protect Slopes

Slopes will be protected with hydraulic mulch, geotextiles/mats, soil binders, or a combination of erosion control practices to limit rill, gully, and channel erosion. The following factors will be considered when selecting protective controls for slopes:

- How steep is the slope? Steep slopes (2:1 or greater) will require more protection than flatter slopes.
- What types of soils are present? Those slopes with highly erodible soils (silty soils) will need more protection than those with less erodible soils (sands and gravels).
- What is the length of the slope? Longer slopes are at greater risk for erosion than shorter slopes.

Additional measures for slope protection include erosion control blankets, slope drains, and cat tracking.

2.6 Protect Storm Drain Inlets

ECS and EEG will be responsible for identifying and installing controls at storm drain inlets along the Project. The type of storm drain inlet protection will not be determined until the inlets are identified. Controls for inlet protection may include inserts or rock filled bags.

2.7 Establish Perimeter Controls and Sediment Barriers

The ROW will be protected against sedimentation using vegetative buffer zones. Additional perimeter control BMPs such as silt fence, straw wattles, and mulch berms will be added, as necessary, to control sedimentation due to erosion. Selection of specific site controls will be determined during the site specific planning phase (Phase I). All selected BMPs will be clearly noted and updated on SWPPP maps and plans. Perimeter controls will remain in place until final stabilization is met at the location the

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control is serving. All BMPs will be installed per the manufacturers recommended specifications and in conjunction with the BMP detail sheets in the Appendix J- Best Management Practices of this SWPPP.

2.8 Retain Sediment On-Site

This Project will not utilize any Sediment / Retention / Detention Basins as a structural BMP due to the scope and linear nature of the Project. Alternative BMPs such as silt fence, straw wattles, and vegetative buffer strips will be utilized instead to control potential sediment and erosion discharges. If structures are necessary, these will be designed by a civil engineer and installed by ECS. EEG will monitor the effectiveness of temporary sediment controls to ensure no sediment or other pollutants are leaving the Project to the extent practical.

2.9 Establish Stabilized Construction Exits

Where feasible, a gravel exit pad (stabilized construction exit) will be installed where dirt access roads intersect with a paved public road. If determined necessary, additional devices such as rumble grates or wheel wash systems may be added. As these items are installed, the SWPPP will be amended to reflect the change in the BMP and detail sheets will be added to Appendix J- Best Management Practices of the SWPPP. The purpose of a stabilized construction exit is to prevent sedimentation track out from occurring on paved roads.

SECTION 3: GOOD HOUSEKEEPING BMPS

3.1 Material Handling and Waste Management

All litter, construction debris, and construction chemicals as outlined in Section 1.8 will be prevented from entering a receiving water or MS4. This will be achieved through the use of on-site trash receptacles and proper storage and containment of materials on-site.

This SWPPP will also address any pollutants from other areas other than construction, such as dedicated concrete plants. Currently, one mobile concrete batch plant has been identified for Project use. Material storage areas associated with the mobile batch plant will be monitored and mitigated for dust control and run off. A dust collector will also be utilized during concrete batching operations. Additional BMPs will be selected for the site as needed based on site specific circumstance. All mitigation measures and stipulations regarding materials and waste management will be implemented as outlined in the POD.

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WASTE MANAGEMENT PRACTICES	
Solid Waste	**Comments**
Trash Containers	Covered containers will be used whenever possible. If they are not covered, they will be leak proof and trash will be removed often to prevent from blowing.
Roll Off Dumpsters	Will be used to control trash and debris. Lids are to be closed when not in use.
Daily Site Clean Up	Personnel will look for evidence of trash daily and dispose of in the appropriate containers
Collection of Waste	Solid waste contractors will pick up on a regular schedule
Concrete Wash Out Areas	Will be present where needed and cleaned out when capacity dictates.
Regulated Materials/Waste	
Fueling Areas	Secondary containment will be in place around fuel storage and fueling areas in material yards. Fueling on ROW will be performed in approved areas, using the approved fueling tools. Spill response materials will be readily available in the instance of a spill.
Oils (hydraulic, motor etc.)	Secondary containment will be in place around oil storage areas in material yards. Spill response materials will be readily available in the instance of a spill.
Fertilizers and Chemicals	Stored in controlled storage facility. Only those materials necessary to perform the work will be stored on vehicles.
Spills	Spill response materials and bulletins will be readily accessible to all work crews.
Portable Toilets	Placed in approved locations away from flow lines. Will be secured to prevent tipping.

3.2 Establish Proper Material Staging Areas

This Project anticipates having a total of eight to twelve primary material staging areas. Seven locations are currently listed in Section 1.1 of the SWPPP. As additional locations are obtained, they will be amended to the SWPPP.

BMPs for material handling and storage will be implemented as identified in Section 3.1 and will include the use of secondary containment structures, and secure storage locations. Additionally, topsoil and spoil stockpiles will be temporarily stored on the ROW. If current perimeter controls are not adequate to contain potential sediment laden runoff from stockpile locations, additional controls will implemented. This may include the use of BMPs such as silt fence, straw wattles, tackifing, and seeding. Operators will also ensure that no stockpiles of any bulk material are placed in a surface water way, wash, or other conveyance system. After construction activities are complete, spoil and top soil stockpiles will be spread onsite, or at other approved locations, and seeded for permanent stabilization.

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3.3 Designated Concrete Washout Areas

Concrete chutes will be washed out into designated concrete wash locations. These locations will be located at least 100 feet from streams and wetlands and contained with berms and barriers to prevent migration of waste water and/or sediments into streams and waterways. If washout containers are utilized, they will be inspected frequently to ensure the container is not leaking and walls have not been damaged. Collected materials will be properly disposed of when the container is 75% full.

3.4 Proper Equipment/Vehicle Fueling and Maintenance Practices

Potential pollutants used for fueling and maintenance during construction will include products such as gasoline, diesel fuel, hydraulic fluid, lubricating oils solvents, cleansers, and other substances. Some of these materials will be stored and used in relatively large quantities at material yards and in rare instances on the ROW to operate and maintain equipment during construction. All materials will be used according to labeling and disposed of properly according to Federal, State, and local regulations.

As identified on the SWPPP Volume II Map Sets, select areas along the ROW have been designated as no fueling areas. No fueling activities may occur at these locations unless a determination is made by the Project CIC under the conditions outlined in the Project's HMMP.

All fueling and maintenance procedures and protocols will conform to the mitigation measures and stipulations outlined in the POD which includes, but is not limited to, the following.

- Heavy equipment used in the Project area will be inspected daily for leaks. No leaking equipment will be used within 100 meters (328 feet) of any water of the United States, including wetlands.

- Use, storage, and transport of materials and wastes will be performed in accordance with all applicable Federal, State, and local regulations, and the requirements of the Project HMMP.

- Storage of fuel, lubricant, or hazardous materials within 100 meters (328 feet) of a waterbody, wetland boundary, or within a designated municipal watershed is prohibited on the Project, unless the location is designated for such use by an appropriate governmental authority. This applies to storage of these materials and does not apply to normal operation or use of equipment in these areas.

- To prevent introduction of petrochemicals into the waters of Utah, fuel, oil, hydraulic fluid, lubricants, and other petrochemicals stored within a floodplain will have an appropriately sized impervious secondary containment system to prevent spills.

- Containers must be kept closed unless material is being transferred. Personnel will ensure that all transferring operations are monitored and not left unattended.

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- Fueling of vehicles and equipment will be performed under controlled conditions using approved fueling tools.

- Refueling and storing potentially hazardous materials shall not occur within a 100-meter (328 foot) radius of a waterbody, a 200-foot radius of all identified private water wells, and a 400-foot radius of all identified municipal or community water supply wells. Spill preventive and containment measures or practices will be incorporated as needed.

- Washing of vehicles will adhere to guidelines under the allowable non-storm water discharges by not using detergents. If detergents are needed, vehicles will be taken off ROW to an approved wash facility.

Unique conditions can occur along the Project ROW where fueling within 100 meters (328 feet) of a waterbody, wetland boundary, or within municipal watersheds may occur. In the instance of such an occurrence the following factors shall be addressed prior to fueling.

- An evaluation of the environmental risks of relocating equipment to a refuel/lubrication area versus those risks involved with fueling/lubricating in place shall be made.

- Appropriate measures will be taken to prevent spills. This includes the use of secondary containment structures and/or drip pans to prevent spills. The appropriate absorbent materials will also be readily available for application as needed.

- Spill response kits will be stationed at sensitive work locations. Additional spill response materials will be located on each work truck including the fuel truck. Spill response kits will include a U.S. Department of Transportation approved container to allow for rapid containment and recovery of any spill of hazardous material.

- Approvals must be obtained from Project environmental personnel prior to fueling.

3.5 Equipment/Vehicle Washing

Weed wash stations will be required at select locations as identified on the SWPPP Volume II Map Set 1. Cleaning activities will concentrate on tracks, feet, or tires and the undercarriage with special emphasis on axles, frame, cross members, motor mounts, underneath steps, running boards, and front bumper/brush guard assemblies. Vehicle cabs will be swept out and refuse will be disposed of in waste receptacles.

A gravel pad will be installed at each wash location consisting of 3”-5” rock, placed a minimum of 8” deep. Geotextile filter fabric will be placed underneath the rock. Vehicle washing will be performed using a portable wash station consisting of a water tank and pressure wash system. Pad dimensions will be a minimum of 15 feet x 50 feet.

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Perimeter berms, diversion devices and/or sediment traps will be installed where needed to control runoff. Washing areas will be clearly marked and personnel will be informed that washing activities must occur in this area. Other activities, such as vehicle repairs, will not be permitted in the wash area. No detergents will be used at weed wash locations. Weed wash areas will be regularly inspected as directed by this SWPPP. Maintenance and repair will be performed as needed throughout the duration of the Project until the wash station is removed and the site is restored.

3.6 Spill Prevention and Control Plan

This Project has a comprehensive HMMP that includes the following plans.

- Hazardous Materials Management Plan;
- Spill Prevention Containment and Countermeasure (SPCC) Plan; and
- Spill Emergency Response for Hazardous Substances Plan (SERHSP)

This program describes the Projects approach toward hazardous materials management, spill prevention, and response/remediation. Also discussed are disposal methods and the personnel responsible for the program.

A copy of the HMMP will be maintained with this SWPPP in the Project office at all times and will be an integral component of the SWPPP.

3.7 Allowable Discharges

The following is a list of allowable non-stormwater discharges, per the General Permit, that could be associated with the construction process. All non-stormwater discharge will be contained and reduced to the extent feasible and BMPs will be in place to minimize any pollutants that may potentially be discharged. The proper BMPs are listed below each non-stormwater discharge and will be in place to help control potential sediment and other pollutants from discharging into receiving waters or MS4s. In general, this site would be discharging allowable non-stormwater. It is anticipated that all non-stormwater discharges will be contained on-site to the extent practicable.

- Discharges from fire-fighting activities;
    - Due to the emergency nature of firefighting activities, protective measure will be implemented as able.

- Waters used to wash vehicles where detergents are not used.
    - As necessary, protective measures will be placed at these locations to prevent the potential discharge of pollutants.
    - Water will be directed toward the Project area to be captured onsite as much as possible.

- Discharges from fire hydrant flushing's
    - As necessary, protective measures will be placed at hydrant locations to prevent the potential discharge of pollutants.

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- Discharges from water to control dust provided effluent or wastewaters are not used;
    - Water will be directed toward the Project area to be captured onsite as much as possible.
    - Water filling stations will be evaluated for BMP implementation. Water filling stations will be kept away from slopes and areas graded back toward the site to the extent practical.
- Discharges from potable water sources including uncontaminated water line flushing.
    - Water will be directed toward the Project area to be captured onsite as much as possible.

- Discharges from routine external building wash downs where detergents are not used;
    - As necessary, protective measures will be placed at these locations to prevent the potential discharge of pollutants.
    - Water will be directed toward the Project area to be captured onsite as much as possible.

- Discharges from pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred (unless the spilled material has been removed) and where detergents are not used.
    - As necessary, protective measures will be placed at these locations to prevent the potential discharge of pollutants.
    - Water will be directed toward the Project area to be captured onsite as much as possible.

- Discharges from uncontaminated air conditioning or compressor condensate.
    - If necessary, a capture system will be placed underneath equipment to catch potential discharges.

- Discharges from uncontaminated ground or water springs.
    - As necessary, protective measures will be placed at these locations to prevent the potential discharge of pollutants.
    - Direct flow toward the Project area to be captured onsite as much as possible.

- Discharges from foundation or footing drains where flows are not contaminated with process material such as solvents; and
    - As necessary, protective measures will be placed at these locations to prevent the potential discharge of pollutants.
    - Direct flow toward the Project area to be captured onsite as much as possible.

- Uncontaminated excavation dewatering.
    - As necessary, protective measures will be placed at these locations to prevent the potential discharge of pollutants.
    - Use of dissipation or retention devices to detain or retain flows as necessary.
    - Direct flow toward the Project area to be captured onsite as much as possible.

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SECTION 4: POST-CONSTRUCTION BMPS

This construction site will not utilize permanent structures such as on-site retention/detention basins. This site will utilize velocity dissipation devices, and stabilization from landscaping. These post-construction stormwater management measures will be installed during the construction process to help control pollutants in stormwater discharges after construction operations have been completed.

All temporary BMPs will be removed prior to filing a NOT for the Project. ECS understands that this may mean the Project is complete, but if final stabilization has not been achieved the NOT may not be filed regardless of the removal of the temporary BMPs.

This Project does not have a discharge connection or permanent stormwater outfall to unique water and understands that it would be prohibited under the General Permit.

The post-construction stormwater BMPs selected to reduce pollutants in storm water discharges after all construction phases have been completed will take into account local post-construction storm water management requirements, policies, and guidelines, as well as site-specific and seasonal conditions.

SECTION 5: INSPECTIONS

5.1 Inspections

EEG will perform site inspections to ensure BMPs are functional and the SWPPP is being properly implemented. As identified in Section 3.5.4 of the General Permit, inspections must be conducted in accordance with one of the two schedules listed below.

- At least once every 7 calendar days; or
- At least once every 14 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater.

Inspection frequency may be reduced to at least once a month if:

- The entire site is stabilized; or
- Runoff is unlikely due to winter conditions (e.g., site is covered with snow, ice, or ground is frozen).

The inspection requirement is waived until one month before thawing conditions are expected to result in discharge if all the requirements are met:

1) The Project is located in an area where frozen conditions are anticipated to continue for extended periods of time (i.e., more than one month)
2) Land disturbance activities have been suspended
3) The beginning and ending dates of the waiver period are documented in the SWPPP

This site will be inspected weekly. If the inspection schedule is changed it will be noted in this SWPPP.

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Within 24 hours after the inspection, the report shall be updated and placed in the SWPPP Volume IV binder. The inspection reports for this Project will be placed in chronological order.

As identified in the General Permit Section 3.5.4.f., inspections at construction sites involving utility line installation may be more limited if the areas described above are not reasonably accessible or could cause additional disturbance of soils and increase the potential for erosion. In these circumstances, controls must be inspected at the same frequency as other construction Projects, but personnel may instead inspect controls along the construction site for 0.25 miles above and below each access point where a roadway, undisturbed ROW, or other similar feature intersects the construction sites and allows access to the areas described above. In the absence of evidence to the contrary, the conditions of the controls along each inspected 0.25 mile segment may be considered as representative of the condition of controls along that reach extending from the end of the 0.25 mile segment to either the end of the next 0.25 mile inspected segment, or to the end of the Project, whichever occurs first.

All inspections shall be performed by qualified personnel. A "qualified personnel" means a person knowledgeable in the principles and practice of erosion and sediment controls who possesses the skills to assess conditions at the construction site that could impact stormwater quality and to assess the effectiveness of any sediment and erosion control measures selected to control the quality of stormwater discharges from the construction activity.

Inspection duties for the Project will be performed by EEG. The following personnel are responsible for conducting inspections. Personnel qualifications can be found in Appendix K- Employee Qualifications.

Name	Qualifications	Company	Phone Number
Bryan Watt	Lead Environmental Inspector/ Utah Registered Stormwater Inspector	EEG	(435) 671-1585
Chris McCarty	Environmental Coordinator	EEG	(435) 503-5876
Rain Gmuer-Johnson	Certified Stormwater Inspector and Preparer	EEG	(435) 503-5592
Kari Kerwin	Utah Registered Stormwater Inspector	EEG	(435) 253- 3035
Josh Mikel	Utah Registered Stormwater Inspector	EEG	(832) 525-8598
Ryan Thompson	Utah Registered Stormwater Inspector	EEG	(435) 841-0448

The inspections for this construction Project will include all areas of the Project that have been disturbed by construction activity, to include the ROW, access roads, construction yards and support facilities.
At a minimum, inspectors shall examine the following areas during each inspection:

- Good housekeeping BMPs
- All erosion and sediment control BMPs to ensure they are in place and functioning as intended

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- All areas disturbed by construction activity and areas used for storage of materials that are exposed to precipitation
- Locations where vehicles and equipment enter and exit the job-site for evidence of off-site sediment accumulations and effectiveness of the tracking device being used
- Site conditions for the evidence of, or the potential for, pollutants entering the MS4
- Accessible discharge points or locations to ascertain whether erosion and sediment control BMPs are effective in preventing significant impacts to receiving waters or tributaries of
- Where discharge locations are inaccessible, nearby downstream locations to the extent that the inspections are practical

The inspection report will have at a minimum:

- The inspection date
- Names, titles, and qualifications of the personnel making the inspection
- Weather information for the periods since the last inspection (or since commencement of the construction activity if the first inspection) including a best estimate of the beginning of each storm event, duration of each storm event, approximate amount of rainfall for each event (in inches), and whether any discharges occurred
- Weather information and a description of any discharges occurring at the time of inspection
- Locations(s) of discharges of sediments or pollutants from the site
- Locations(s) of BMPs that need to be maintained
- Location(s) of BMPs that failed to operate as designed or proved inadequate for a particular location
- Location(s) where additional BMPs are needed that did not exist at the time of inspection
- Corrective action required, including any changes to the SWPPP necessary and implementation dates

In general, sediment captured by sediment control devices must be removed when it has accumulated half way up the height of the BMP device. Removed sediment will be secured on site where it will not wash into inlets, ditches, channels, or streams or cause other adverse environmental impacts. All maintenance needs identified in inspections, shall be accomplished before the next anticipated storm event, or as necessary to maintain continued effectiveness of stormwater controls. If maintenance prior to the next anticipated storm event is impracticable, maintenance must be scheduled and accomplished as soon as practicable (General Permit Section 3.5.3).

A record of each inspection and of all corrective actions taken in accordance with this SWPPP will be maintained for at least three years from the date that permit coverage's expires or is terminated. Inspection reports and corrective action logs will be maintained in Volume IV- Inspection Reports and Corrective Action Log of this SWPPP.

Any revisions to this SWPPP will be completed within 7 calendar days following the inspection. Implementation will be completed before the next anticipated storm event of 0.5 inches or more. If this is not possible, then implementation will be completed as soon as practicable.

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5.2 Delegation of Authority

ECS has delegated EEG to be a duly authorized representative for the purpose of overseeing compliance with environmental requirements, including the General Permit for the Project. The designee is authorized to sign any reports, stormwater pollution prevention plans, and all other documents required by the General Permit.

A copy of the signed delegation form is located at the beginning of this SWPPP.

5.3 Corrective Action Log

Please refer to Appendix L- Corrective Action Log, which will be used to describe repair, replacement, and maintenance of BMPs undertaken as a result of the inspections and maintenance procedures. This log will describe the action taken, the date completed, and the person that completed the work.

SECTION 6: RECORDKEEPING AND TRAINING

6.1 Recordkeeping

A copy of this SWPPP and all reports required by the General Permit, and records of all data used to complete the NOI application will be maintained for a period of at least 3 years from the date that the site is finally stabilized and the permit is terminated. This will include, but is not limited, to the following:

- Dates of grading, construction activity, and stabilization
- A copy of the General Permit
- The signed NOI form or permit application
- A copy of the State notification indicating their receipt of your complete NOI application
- Inspection records
- Records relating to endangered species and historic preservation

After final stabilization the SWPPP is no longer required to be onsite, but may be maintained at the Permitee's primary headquarters.

6.2 Amendments to the Plan

This SWPPP shall be revised as necessary during its permit coverage (until a NOT is filed) to reflect current conditions and maintain its accuracy. The following conditions warrant an amendment to the Plan.

- This SWPPP shall be amended whenever there is a change in construction or operations that may affect the discharge of pollutants to surface waters or groundwater.

- This SWPPP shall be amended whenever inspections or investigation by site operators, local, State, or Federal officials indicate the SWPPP is proving ineffective in eliminating or significantly minimizing pollutants from the sources identified under Part 3.5.1 of this Permit, or otherwise

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not achieving the general objective of controlling pollutants in storm water discharges associated with construction activity.

- This SWPPP shall be amended whenever a new owner/operator becomes responsible for implementing all or part of the SWPPP, as described in Part 3.4 and Part 4.3 of the General Permit.

Amendments and implement schedules shall be performed in a timely manner, but in no case more than 14 days after it has been determined that the SWPPP is inadequate. All amendments will be dated and directly attached to the SWPPP.

Please reference Appendix M- Amendment Log for more information.

6.3 Training

Training of Project employees and subcontractors is an effective BMP. Stormwater training will include the following topics: erosion control BMPs, sediment control BMPs, non-stormwater BMPs, and good housekeeping BMPs. This training will be additionally tailored and/or supplemented for those employees with specific stormwater responsibilities. Training records will be maintained in the Project office along with this SWPPP.

SECTION 7: FINAL STABILIZATION

Final stabilization along the ROW, material yards, and other construction related areas, will be phased throughout the Project as construction activities are completed. This will include tower site locations, pull sites, sleeving sites, staging areas, material yards, maintenance yards, temporary access roads, and temporary construction support facilities.

Overall, native vegetation will provide for the final (permanent) stabilization of the work area. Seed selection will be based on site-specific conditions and tailored for each work location or region throughout the Project. Information on Project seed requirements was previously discussed in Section 2.4 of this SWPPP.

Areas that have achieved final stabilization will be noted in the SWPPP.

ECS will terminate coverage under the General Permit (UTR 300000) by submitting a NOT within thirty days after completion of all construction activities and completion of final stabilization of all areas of the site as defined in Part 6.15.

Part 6.15 contains the definition of "Final Stabilization". Per the General Permit, Final Stabilization means that all soil disturbing activities at the site have been completed, and that a uniform (e.g. evenly distributed, without large bare areas) perennial vegetative cover with a density of 70% of the native background vegetative cover for the area has been established on all unpaved areas not covered by permanent structures, or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geo-textiles). In some parts of the project, background native vegetation will cover less than

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100% of the ground (e.g. arid areas). Establishing at least 70% of the natural cover of native vegetation meets the vegetative cover criteria for final stabilization. For example, if the native vegetation covers 50% of the ground, 70% of 50% would require 35% total cover for final stabilization.

The NOT shall be submitted on the form specified by the Executive Secretary.

SECTION 8: CERTIFICATION

This SWPPP will be signed and certified by all Project construction operators and subcontractors. Operator and subcontractor certifications are located at the beginning of this SWPPP.

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Rocky Mountain Power
Exhibit RMP___(RAV-18)
Docket No. 17-035-40
Witness: Rick A. Vail

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

Exhibit Accompanying Direct Testimony of Rick A. Vail

Additional Details on Required Permits

June 2017

Major Permits, Approvals, and Consultations for the Gateway West Transmission Line Project (Excerpts from Table 1.4.1 from FEIS)

Regulatory Agency	Required Permit, Approval, or Consultation	Agency Action
Advisory Council on Historic Preservation	Section 106 Consultation, National Historic Preservation Act	Has the opportunity to comment if the Project may affect cultural resources that are either listed on or eligible for listing on the National Register of Historic Places (NRHP).
U.S. Department of Defense, Army Corps of Engineers (USACE), Omaha District, Walla Walla District	Section 404, Clean Water Act Permit	Consider issuance of a Section 404 permit for the placement of dredge or fill material into all waters of the United States, including jurisdictional wetlands.
U.S. Department of the Interior, Bureau of Land Management (BLM)	Antiquities and Cultural Resource Use Permit	Has the opportunity to issue permits for use in complying with Section 106 NHPA Act.
	Various Resource Management Plans	Item completed as part of the NEPA process and ROD issuance.
	ROW Grant	ROW Grant received November 2013.
	Plan of Development (POD)	Consider approval of detailed POD.
	Notice to Proceed	Following issuance of a ROW grant and approval of a POD, consider issuance of a Notice to Proceed with Project development and mitigation activities.
U.S. Department of Transportation, Federal Highway Administration	Encroachment Permit	Consider issuance of permit for transmission line crossing of federally funded highways (typically delegated to the state department of transportation).
U.S. Environmental Protection Agency, Regions 8 and 10	Section 401, Clean Water Act (CWA) Water Quality Certification	In conjunction with states, consider issuance of water use and crossing permits.

	Section 402, CWA, National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction Activity for Idaho	Review and issue NPDES permit for discharge of Stormwater in Idaho. In Wyoming, NPDES permitting is delegated to the Wyoming Department of Environmental Quality (see below).
	Section 404, CWA	Review CWA, Section 404 applications for dredge-and-fill applications for the USACE with 404(c) veto power for permits issued by the USACE.
Wyoming		
All state agencies	Compliance with Executive Order (EO) 2011-5	Requires that all agencies demonstrate that activity proposed for permitting be compliant with the requirements of the EO in sage-grouse core areas.
Wyoming Department of Environmental Quality (WDEQ) and the Wyoming Industrial Siting Council	Industrial Siting Permit Wyoming Industrial Information and Siting Act under Chapters 1 and 2, Rules and Regulations of the Industrial Siting Council	Considers approval of construction and siting of projects with construction cost of $176 million or more or 160 kV or greater.
WDEQ Air Quality Division	Construction Permit	Consider measures to control fugitive dust emissions during construction.
WDEQ Water Quality Division	Section 401, CWA, Water Quality Certification	Consider certification of a 404 permit issued by the USACE as consistent with state law and Section 401.
	Section 402, CWA, NPDES General Permit for Stormwater Discharges Associated with Construction Activity for Wyoming	Review and issue NPDES permit for discharge of stormwater.
Wyoming Game and Fish Department	Potential Project Impacts to Fish and Wildlife Species and Their Habitat	Coordinate with BLM, Forest Service, and USFWS on wildlife issues/impacts associated with the Project.

Wyoming State Historic Preservation Office	Section 106 Consultation, NHPA	Consult with the BLM, the Proponents, other land management agencies, and others regarding activities potentially affecting cultural resources.
Wyoming Office of State Lands and Investments	Easement Across State Lands	Consider issuance of a ROW across state lands.
Wyoming Public Service Commission,	Certificate of Public Convenience and Necessity	Consider issuance of a certificate to allow construction of a public utility, including transmission lines
Wyoming Department of Transportation	Encroachment Permit	Consider issuance of permit to cross or bore under state highways or be within a state highway ROW.
Various (may also require federal and county approvals)	Explosives Permit	Consider issuance of a license to store and use explosives.

REDACTED
Rocky Mountain Power
Docket No. 17-035-40
Witness: Rick T. Link

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

REDACTED
Direct Testimony of Rick T. Link

June 2017

Q. Please state your name, business address, and position with PacifiCorp.

A. My name is Rick T. Link. My business address is 825 NE Multnomah Street, Suite 600, Portland, Oregon 97232. My position is Vice President, Resource and Commercial Strategy. I am testifying on behalf of Rocky Mountain Power, a division of PacifiCorp.

Q. Please describe the responsibilities of your current position.

A. I am responsible for PacifiCorp's integrated resource plan ("IRP"), structured commercial business and valuation activities, long-term commodity price forecasts, long-term load forecasts, and environmental strategy and policy activities. Most relevant to this docket, I am responsible for the economic analysis used to screen system resource investments and for conducting competitive request for proposal ("RFP") processes consistent with applicable state procurement rules and guidelines.

Q. Please describe your professional experience and education.

A. I joined PacifiCorp in December 2003 and assumed the responsibilities of my current position in September 2016. Over this time period, I held several analytical and leadership positions responsible for developing long-term commodity price forecasts, pricing structured commercial contract opportunities and developing financial models to evaluate resource investment opportunities, negotiating commercial contract terms, and overseeing development of PacifiCorp's resource plans. I was responsible for delivering PacifiCorp's 2013, 2015, and 2017 IRPs; have been directly involved in several resource RFP processes; and performed economic analysis supporting a range of resource investment opportunities. Before joining PacifiCorp, I was an energy and environmental economics consultant with ICF Consulting (now ICF International) from 1999 to 2003, where I performed electric-sector financial modeling of

environmental policies and resource investment opportunities for utility clients. I received a Bachelor of Science degree in Environmental Science from the Ohio State University in 1996 and a Masters of Environmental Management from Duke University in 1999.

Q. Have you testified in previous regulatory proceedings?

A. Yes. I have testified in proceedings before the Utah Public Service Commission, the Wyoming Public Service Commission, the Public Utility Commission of Oregon, and the Washington Utilities and Transportation Commission.

PURPOSE AND SUMMARY OF TESTIMONY

Q. What is the purpose of your testimony?

A. I present and explain the economic analysis that supports PacifiCorp's decision to construct or procure four new Wyoming wind resources with a total capacity of 860 megawatts ("MW") (collectively, the "Wind Projects"), and the decision to construct the "Aeolus-to-Bridger/Anticline Line" and construct the 230 kV Network Upgrades (collectively, the "Transmission Projects").[1] The Transmission Projects

[1] As more specifically described in the testimony of Mr. Rick A. Vail, the Transmission Projects include: (1) a new 140-mile, 500 kV transmission line segment and associated infrastructure running from the new Aeolus substation near Medicine Bow, Wyoming, to the new Anticline substation located near the existing Jim Bridger substation, which includes construction of the new Aeolus and Anticline substations; (2) a new five-mile, 345 kV transmission line that will extend from the proposed Anticline substation to the existing Jim Bridger substation, which includes modifications at the existing Jim Bridger substation to allow termination of the new 345 kV line; (3) installation of a voltage control device at the Latham substation; (4) a new 16-mile, 230 kV transmission line running from the Company's existing Shirley Basin substation to the proposed Aeolus substation, which requires modifications to the Shirley Basin substation and interconnection facilities in the new Aeolus substation to accommodate the new line; (5) reconstruction of four miles of an existing 230 kV transmission line between the proposed Aeolus substation and the Freezeout substation, which requires modifications to the Freezeout substation and interconnection facilities in the new Aeolus substation to accommodate the rebuilt line; and (6) reconstruction of 14 miles of an existing 230 kV transmission line between the Freezeout substation and the Standpipe substation, which requires modifications to the Freezeout and Standpipe substations to accommodate the rebuilt line. Items 1 through 3 are collectively referred to as the "Aeolus-to-Bridger Anticline Line," and items 4 through 6 are collectively referred to as the "230 kV Network Upgrades."

enable interconnection of the new wind resources. My testimony demonstrates that PacifiCorp's proposals to construct or acquire approximately 860 MW of new Wind Projects and construct the Transmission Projects (collectively, the "Combined Projects") is in the public interest. My testimony also summarizes PacifiCorp's assessment of new Wyoming wind resources and the Aeolus-to-Bridger/Anticline Line in its 2017 IRP.

Q. Please summarize your testimony.

A. PacifiCorp's economic analysis supports investments in the Combined Projects. The Wind Projects, which are enabled by the Transmission Projects, will generate federal production tax credits ("PTCs") for ten years; produce zero-fuel-cost energy that will lower net power costs ("NPC"); generate renewable-energy credits ("RECs"), which can be sold in the market to create additional revenues that would lower net customer costs; and help decarbonize PacifiCorp's resource portfolio, which will mitigate long-term risk associated with potential future state and federal policies targeting carbon dioxide ("CO_2") emissions reductions from the electric sector.

The Transmission Projects will relieve congestion on the current transmission system in eastern Wyoming, enable new wind resource interconnections, provide critical voltage support to the Wyoming transmission network, improve overall reliability of the transmission system, enhance PacifiCorp's ability to comply with mandated reliability and performance standards, and reduce line losses. Moreover, the proposed transmission-system investments create an opportunity for further increases to the transfer capability across the Aeolus-to-Bridger/Anticline Line with the construction of additional segments of Energy Gateway.

The Combined Projects will produce customer benefits that significantly outweigh costs. The change in revenue requirement due to the Combined Projects was analyzed using two different modeling tools across nine different scenarios, each with varying natural-gas and CO_2 price assumptions. For each of these scenarios, the present-value revenue requirement differential ("PVRR(d)") was calculated from system revenue requirement forecasts through 2050 (through the 30-year life of the Wind Projects), reflecting nominal capital revenue requirement from the Combined Projects, and from system revenue requirement forecasts over a 20-year period, where capital revenue requirement is levelized.

The Combined Projects show PVRR(d) benefits in seven of the nine scenarios (all scenarios except two using the lowest natural-gas price assumptions) when calculated from system revenue requirement forecasts through 2050. The present-value reduction to the change in system revenue requirement through 2050 is $137 million when assuming medium natural-gas and medium CO_2 price assumptions.

In seven of the nine scenarios (all scenarios except two using the lowest natural-gas price assumptions), the Combined Projects show PVRR(d) benefits when calculated from system revenue requirement forecasts over a 20-year period. Over this 20-year forecast period, the present-value reduction to the change in system revenue requirement due to the Combined Projects ranges between $85 million and $124 million when assuming medium natural-gas and medium CO_2 price assumptions.

The customer benefits from the Combined Projects increase substantially with higher natural-gas price assumptions and higher CO_2 price assumptions. These benefits conservatively do not assign any value to the RECs that will be generated by the Wind

Projects. For every dollar assigned to the incremental RECs that will be generated by the Wind Projects, present-value benefits would improve for all scenarios by an additional $34 million when calculated from the change in system revenue requirement through 2050. When calculated from the change in system revenue requirement over a 20-year period, each dollar assigned to the incremental RECs from the Wind Projects would increase PVRR(d) benefits by $26 million.

Sensitivity analysis shows that substantial benefits of the Combined Projects persist when paired with PacifiCorp's plans to upgrade or "repower" certain wind resources, which is the subject of a concurrently filed application. Sensitivity analysis also shows that there is additional upside to customer benefits if the new equipment is depreciated over a longer life.

2017 INTEGRATED RESOURCE PLAN

Q. Did PacifiCorp analyze new Wyoming wind resources and the Aeolus-to-Bridger/Anticline Line in its 2017 IRP?

A. Yes. The 2017 IRP preferred portfolio, representing PacifiCorp's least-cost, least-risk plan to reliably meet customer demand over a 20-year planning period, includes 1,100 MW of new wind resources located in Wyoming. This wind capacity is enabled by the Aeolus-to-Bridger/Anticline Line, which is also included in the 2017 IRP preferred portfolio. The new wind and Aeolus-to-Bridger/Anticline Line are assumed to be placed in service by the end of 2020 so that the new wind resources can qualify for the full value of PTCs.

Q. What led PacifiCorp to include 1,100 MW of new Wyoming wind resources and the Aeolus-to-Bridger Anticline Line in its 2017 IRP preferred portfolio?

A. All of the resource portfolios produced during the initial stages of the portfolio-development phase of the 2017 IRP contained new Wyoming wind resources in 2021, which for modeling purposes was used as a proxy on-line date for PTC-eligible wind achieving commercial operation by the end of 2020. At the same time, the load-and-resource balance developed for the 2017 IRP shows that PacifiCorp would not require incremental system capacity to meet its 13-percent planning-reserve margin until 2028, accounting for assumed coal unit retirements, incremental energy efficiency savings, and available wholesale-power market purchase opportunities. These results indicated that PTC-eligible wind resources located in wind-rich areas like Wyoming provide customer benefits.

During the initial stages of portfolio development for the 2017 IRP, the amount of Wyoming wind capacity that routinely appeared in 2021 was limited by transmission congestion on PacifiCorp's existing 230 kV transmission system. This congestion affects energy output from resources in eastern Wyoming where there is substantial potential to develop high-quality, low-cost wind resources. Wyoming resource selections at or near the limitation on Wyoming wind capacity caused by transmission constraints indicated clear potential for incremental customer benefits if incremental transmission is added to accommodate more PTC-eligible wind resources located in Wyoming.

To assess these potential incremental benefits, PacifiCorp reviewed components of its Energy Gateway transmission project to identify specific sub-

segments that could access additional new Wyoming wind resources. In performing this review, PacifiCorp looked at the transmission interconnection queue and determined that sub-segment D2 (the Aeolus-to-Bridger/Anticline Line) of the Energy Gateway transmission project could access a sizable volume of new wind projects being developed in the Aeolus area. PacifiCorp then developed an initial, high-level cost estimate for the Aeolus-to-Bridger/Anticline Line that was used for an initial Aeolus-to-Bridger/Anticline sensitivity assuming 650 MW of incremental transfer capability and 900 MW of new Wyoming wind resources.

Q. Why did PacifiCorp assume new wind resource capacity in excess of the assumed incremental transfer capability of the Aeolus-to-Bridger/Anticline Line in this initial sensitivity?

A. The Aeolus-to-Bridger/Anticline Line can enable new resource interconnections in excess of the transfer capability of the line. PacifiCorp's preliminary sensitivity in the 2017 IRP assumed the Aeolus-to-Bridger/Anticline Line would support at least 900 MW of new resource interconnections. The assumed level of new wind resources is higher than the assumed incremental transfer capability of the transmission line because wind resources do not generate at their full capability in all hours of the year. At times when wind resources in southeastern Wyoming are operating near full output, other resources in the area can be re-dispatched to accommodate PTC-producing wind generation.

Q. What were the results of this initial Aeolus-to-Bridger/Anticline sensitivity?

A. The initial sensitivity indicated that there could be economic benefits from aligning development of the Aeolus-to-Bridger/Anticline Line with new, PTC-eligible

Wyoming wind resources. Based on the promising results from this initial sensitivity, PacifiCorp reviewed its initial, high-level assumptions to determine how refined inputs would affect potential benefits from the incremental new Wyoming wind resources and the Aeolus-to-Bridger/Anticline Line.

PacifiCorp completed power flow and dynamic-stability studies to refine its Aeolus-to-Bridger/Anticline Line assumptions. These studies supported increasing the assumed incremental transfer capability of the new transmission line from 650 MW to 750 MW and suggested that it could enable up to 1,270 MW of new resource interconnections. PacifiCorp also refined its initial, high-level cost assumptions, reducing the estimated capital cost of the project by over $100 million.

In addition, PacifiCorp reviewed its new wind resource cost-and-performance assumptions, initially developed to represent proxy Wyoming wind resources, to focus on specific projects that could be developed in the Aeolus area. Based on this review, PacifiCorp determined that the estimated capital cost for new wind resources could be lowered by 10.7 percent from its initial proxy cost assumptions and that its wind capacity factor assumptions should be reduced from 43 percent to 41.2 percent.

In addition to refining its transmission and new wind resource assumptions, PacifiCorp reviewed whether additional benefits from the wind enabled by the Aeolus-to-Bridger/Anticline Line could be quantified. PacifiCorp identified and quantified three additional value streams associated with its participation in the energy imbalance market ("EIM"), improved transmission reliability, and reduced transmission line losses.

The results from this additional review and analysis were applied in the final

2017 IRP resource-portfolio screening process, where PacifiCorp conducted additional studies that considered analysis performed in earlier resource-portfolio screening stages.

Q. What type of analysis did PacifiCorp consider from earlier resource-portfolio screening stages?

A. In earlier stages of its resource-portfolio screening process, PacifiCorp developed a wind repowering sensitivity, where certain existing wind resources qualify for an additional ten years of PTCs after they are upgraded with modern equipment. The wind repowering project, the subject of a concurrently filed application, showed significant net customer benefits across a range of assumptions related to forward market prices and federal CO_2 policy based on the Clean Power Plan ("CPP"). Considering the significant customer benefits associated with the wind repowering project, PacifiCorp combined its refined assumptions for incremental new Wyoming wind and the Aeolus-to-Bridger/Anticline Line in a study that included wind repowering.

Q. What were the results of PacifiCorp's final 2017 IRP resource-portfolio screening process that incorporated refined and expanded input assumptions for incremental new Wyoming wind resources and the Aeolus-to-Bridger/Anticline Line?

A. Studies developed for the final 2017 IRP resource-portfolio screening process showed significant net customer benefits relative to other resource-portfolio alternatives. Based on these results, the Aeolus-to-Bridger/Anticline Line and the 1,100 MW of new Wyoming wind resources, both assumed to be placed in service by the end of 2020, were included in the 2017 IRP preferred portfolio.

Q. What are the benefits associated with the new Wyoming wind assumed to come online by the end of 2020 that was included in the 2017 IRP preferred portfolio?

A. This new wind, which was included in the 2017 IRP preferred portfolio, will deliver several different benefits for customers. First, these new wind resources will generate PTCs for ten years after being placed in service. The current value of federal PTCs, which is adjusted annually for inflation by the Internal Revenue Service, is $24 per megawatt-hour ("MWh"). At a federal and state effective tax rate of 37.95 percent, the current PTC equates to a $38.68 per MWh reduction in revenue requirement that can be passed through to customers. Second, these zero-fuel-cost assets will provide incremental NPC benefits for customers. Third, the new wind facilities will generate RECs, which can be sold in the market to create additional revenues that would lower net customer costs. Fourth, these zero-emissions assets will help to decarbonize PacifiCorp's resource portfolio and mitigate long-term risk associated with potential future state and federal policies targeting CO_2 emissions reductions from the electric sector.

Q. What are the benefits associated with the Aeolus-to-Bridger/Anticline Line included in the 2017 IRP preferred portfolio?

A. As is the case with the new wind resources, the Aeolus-to-Bridger/Anticline Line will also deliver several benefits for customers. The new line will relieve congestion on the current transmission system in eastern Wyoming and enable the additional wind resource interconnections. As discussed by Mr. Rick A. Vail, the Aeolus-to-Bridger/Anticline Line will also provide critical voltage support to the Wyoming transmission network, improve overall reliability of the transmission system, enhance

PacifiCorp's ability to comply with mandated reliability and performance standards, reduce line losses, and creates an opportunity for further increases to the transfer capability across the Aeolus-to-Bridger/Anticline Line with the construction of additional segments of Energy Gateway.

Q. Did PacifiCorp include an action item for new Wyoming wind resources in its 2017 IRP action plan?

A. Yes. The 2017 IRP action plan, which lists the specific steps PacifiCorp will take over the next two to four years to deliver resources in the preferred portfolio, includes the following action item associated with the new Wyoming wind resources:

> PacifiCorp will issue a wind resource request for proposals (RFP) for at least 1,100 MW of Wyoming wind resources that will qualify for federal wind production tax credits and achieve commercial operation by December 31, 2020.
>
> - April 2017, notify the Utah Public Service Commission of intent to issue the Wyoming wind resource RFP.
> - May-June, 2017, file a draft Wyoming wind RFP with the Utah Public Service Commission and the Washington Utilities and Transportation Commission.
> - May-June, 2017, file to open a Wyoming wind RFP docket with the Public Utility Commission of Oregon and initiate the Independent Evaluator RFP.
> - June-July, 2017, file a draft Wyoming wind RFP with the Public Utility Commission of Oregon and file a Public Convenience and Necessity (CPCN) application with the Public Service Commission of Wyoming.
> - By August 2017, obtain approval of the Wyoming wind resource RFP from the Public Utility Commission of Oregon, the Utah Public Service Commission and the Washington Utilities and Transportation Commission.
> - By August 2017, issue the Wyoming wind RFP to the market.
> - By October 2017, Wyoming wind RFP bids are due.
> - November-December, 2017, complete initial shortlist bid evaluation.
> - By January 2018, complete final shortlist bid evaluation, seek acknowledgment of the final shortlist from the Public Utility Commission of Oregon, and seek approval of winning bids from the Utah Public Service Commission.

- By March 2018, receive CPCN approval from the Wyoming Public Service Commission.
- Complete construction of new wind projects by December 31, 2020.[2]

Q. Please describe the resource procurement requirements in PacifiCorp's Oregon and Utah jurisdictions applicable to the new Wyoming wind resource action item included in the 2017 IRP action plan.

A. The Public Utility Commission of Oregon established competitive bidding requirements for certain resource acquisitions applicable to Oregon's investor-owned utilities (the Competitive Bidding Guidelines).[3] Because of the multi-state regulatory approach for cost recovery of PacifiCorp's generation assets and NPC, the new Wyoming wind resources will be subject to these Competitive Bidding Guidelines as it relates to cost recovery for Oregon's allocated share of costs. The new Wyoming wind resources described in the 2017 IRP action plan could exceed the 100 MW threshold size for any given project as established by the Competitive Bidding Guidelines. Therefore, procurement of these Wyoming wind resources is governed by these guidelines.

In addition, Utah's Energy Resource Procurement Act requires a competitive solicitation process before the acquisition of renewable resources greater than 300 MW.[4] While it is not certain whether a single wind resource acquired through a competitive bidding process will exceed 300 MW, PacifiCorp is proceeding with filings under the Utah Energy Resource Procurement Act because the total new wind resource capacity assumed to come online by the end of 2020 that is in the 2017 IRP preferred

[2] PacifiCorp 2017 Integrated Resource Plan, Volume I at 16-17 (Apr. 4, 2017).
[3] The Competitive Bidding Guidelines were established by OPUC Order No. 06-446 in Docket No. UM 1182.
[4] *See* Utah Code Ann. § 54-17-201 *et. seq.*

portfolio exceeds the 300 MW threshold established by Utah's statute.

Q. Please summarize PacifiCorp's progress with the Wyoming wind resource procurement action item outlined in the 2017 IRP action plan.

A. PacifiCorp notified the Utah Public Service Commission ("UPSC") of its intent to issue the Wyoming wind resource RFP (the "2017R RFP") on April 17, 2017. This notification initiated the process for the UPSC to hire an independent evaluator ("IE") to oversee the 2017R RFP process. PacifiCorp subsequently filed its draft 2017R RFP with the UPSC on June 16, 2017. The draft 2017R RFP is seeking bids for Wyoming wind resources that can be placed in service by the end of 2020 and that are capable of interconnecting to, and/or delivering energy and capacity across, PacifiCorp's transmission system in Wyoming. PacifiCorp is encouraging bidders to offer proposals under a range of different structures, including power purchase agreements ("PPAs") and build-transfer agreements.

PacifiCorp also filed an application with the Public Utility Commission of Oregon requesting that a docket be opened to approve the 2017R RFP and to appoint its own IE to oversee the 2017R RFP process.

Since the 2017 IRP was filed, PacifiCorp determined that the 2017R RFP does not need to be filed and approved by the Washington Utilities and Transportation Commission.

In his testimony, Mr. Chad A. Teply addresses the construction schedule for the new Wyoming wind resources.

Q. What is the timing of the 2017R RFP and how does it compare with PacifiCorp's proposed Wyoming CPCN schedule?

A. PacifiCorp anticipates releasing the 2017R RFP to the market by the end of August 2017 and receiving bids in the first half of October 2017. PacifiCorp plans to have its analysis of bids completed in early January 2018. After finalizing its bid analysis, PacifiCorp will make a supplemental filing in this docket, so that parties and the Commission can review and respond to project-specific information and the associated economic analysis confirming the net customer benefits from the Combined Projects. Maintaining implementation schedules for the Wind Projects, the Transmission Projects, and the 2017R RFP will require a conditional Wyoming CPCN, subject to final acquisition of all rights-of-ways, for the Transmission Projects under the schedule included in the application.

Q. Why will PacifiCorp's benchmark resources play an important role in the 2017R RFP?

A. PacifiCorp's benchmark resources will provide an alternative contracting-and-implementation cost basis that reflects competitive market-equipment-and-construction costs while promoting participation from market bids offering other project-delivery structures. PacifiCorp anticipates receiving bids in response to the 2017R RFP under a range of structures. Development and submittal of benchmark resources expand competitive-market offerings under a commercial structure that would otherwise not be available.

Q. Why is PacifiCorp not waiting until completion of the 2017R RFP to file its applications with states for approval of the Wind Projects?

A. The Combined Projects under review in this Application are unique. The Wind Projects and Transmission Projects are time-sensitive and codependent. These unique attributes make it impossible to complete the 2017R RFP before initiating review of the Transmission Projects without jeopardizing the in-service dates that are critical to delivering the customer benefits summarized later in my testimony. As described by Mr. Vail, the critical-path schedule for the Transmission Projects is the CPCN procedural schedule. If PacifiCorp were to wait for the 2017R RFP to finish in the first quarter of 2018 to begin lengthy resource review processes, it would not be possible to place the Transmission Projects in service by the end of 2020, which would eliminate the net customer benefits of this time-sensitive opportunity.

Nonetheless, PacifiCorp will fully and appropriately demonstrate the net customer benefits of the Combined Projects using market-based information from competitive procurement processes. To support this objective, PacifiCorp has initiated this process with proxy benchmark resource information that can ultimately be validated using project-specific information and associated economic analysis from the 2017R RFP.

Q. Did PacifiCorp include an action item for the Aeolus-to-Bridger/Anticline Line in its 2017 IRP action plan?

A. Yes. The 2017 IRP action plan includes the following action item associated with the Aeolus-to-Bridger/Anticline Line:

> By December 31, 2020, PacifiCorp will build the 140-mile, 500 kV transmission line running from the Aeolus substation near Medicine Bow,

Wyoming, to the Jim Bridger power plant (a sub-segment of the Energy Gateway West transmission project). This includes pursuing regulatory review and approval as necessary.

- June-July 2017, file a CPCN application with the Wyoming Public Service Commission.
- By March 2018, receive conditional CPCN approval from the Wyoming Public Service Commission pending acquisition of rights of way.
- By December 2018, obtain Wyoming Industrial Siting permit and issue EPC limited notice to proceed.
- Complete construction of the transmission line by December 31, 2020.[5]

Q. Please summarize PacifiCorp's progress with the Aeolus-to-Bridger/Anticline Line action item in the 2017 IRP action plan.

A. This application is being filed consistent with the 2017 IRP action plan to pursue regulatory review and approval. Mr. Vail addresses the construction schedule for the Aeolus-to-Bridger/Anticline Line and the 230 kV Network Upgrades identified in this Application.

SYSTEM MODELING METHODOLOGY

Q. Please summarize the methodology PacifiCorp used in its system analysis of the Combined Projects.

A. PacifiCorp relied upon the same modeling tools used to develop and analyze resource portfolios in its 2017 IRP to refine and update its analysis of the Combined Projects. These modeling tools calculate system PVRR by identifying least-cost resource portfolios and dispatching system resources over a 20-year forecast period (2017–2036). Net customer benefits are calculated as the PVRR(d) between two simulations of PacifiCorp's system. One simulation includes the Combined Projects, and the other simulation excludes the Combined Projects. Customers are expected to realize benefits

[5] PacifiCorp 2017 Integrated Resource Plan, Volume I at 17 (Apr. 4, 2017).

when the system PVRR with the Combined Projects is lower than the system PVRR without the Combined Projects. Conversely, customers would experience increased costs if the system PVRR with the Combined Projects were higher than the system PVRR without the Combined Projects.

Q. What modeling tools did PacifiCorp use to perform its system analysis of the Combined Projects?

A. PacifiCorp used the System Optimizer ("SO") model and the Planning and Risk model ("PaR") to develop resource portfolios and to forecast dispatch of system resources in simulations with and without the Combined Projects.

Q. Please describe the SO model and PaR.

A. The SO model is used to develop resource portfolios with sufficient capacity to achieve a target planning-reserve margin. The SO model selects a portfolio of resources from a broad range of resource alternatives by minimizing the system PVRR. In selecting the least-cost resource portfolio for a given set of input assumptions, the SO model performs time-of-day, least-cost dispatch for existing resources and prospective resource alternatives, while considering the cost-and-performance characteristics of existing contracts and prospective demand-side-management ("DSM") resources—all within or connected to PacifiCorp's system. The system PVRR from the SO model reflects the cost of existing contracts, wholesale-market purchases and sales, the cost of new and existing generating resources (fuel, fixed and variable operations and maintenance, and emissions, as applicable), the cost of new DSM resources, and levelized revenue requirement of capital additions for existing coal resources and potential new generating resources.

PaR is used to develop a chronological unit commitment and dispatch forecast of the resource portfolio generated by the SO model, accounting for operating reserves and the volatility and uncertainty in key system variables. PaR captures volatility and uncertainty in its unit commitment and dispatch forecast by using Monte Carlo sampling of stochastic variables, which include load, wholesale electricity and natural-gas prices, hydro generation, and thermal unit outages. PaR uses the same common input assumptions that are used in the SO model, with resource-portfolio data provided by the SO model results. The PVRR from PaR reflects a distribution of system variable costs, including variable costs associated with existing contracts, wholesale-market purchases and sales, fuel costs, variable operations and maintenance costs, emissions costs, as applicable, and costs associated with energy or reserve deficiencies. Fixed costs that do not change with system dispatch, including the cost of DSM resources, fixed operations and maintenance costs, and the levelized revenue requirement of capital additions for existing coal resources and potential new generating resources, are based on the fixed costs from the SO model, which are combined with the distribution of PaR variable costs to establish a distribution of system PVRR for each simulation.

Q. How has PacifiCorp historically used the SO model and PaR?

A. PacifiCorp uses the SO model and PaR to produce and evaluate resource portfolios in its IRP. PacifiCorp also uses these models to analyze resource-acquisition opportunities, resource retirements, resource capital investments, and system transmission projects. The models were used to support the successful acquisition of the Chehalis combined-cycle plant, to support selection of the Lake Side 2 combined-cycle resource through a RFP process, and to evaluate installation of emissions control

equipment. These models will also be used to evaluate bids in the soon-to-be-issued 2017R RFP.

Q. Are the SO model and PaR the appropriate tools for analyzing the net customer benefits of the Combined Projects?

A. Yes. The SO model and PaR are the appropriate modeling tools when evaluating significant capital investment that influence PacifiCorp's resource mix and affect least-cost dispatch of system resources. The SO model simultaneously and endogenously evaluates capacity and energy trade-offs associated with resource capital projects and is needed to understand how the type, timing, and location of future resources might be affected by the Combined Projects. PaR provides additional granularity on how the Combined Projects are projected to affect system operations, recognizing that key system conditions are volatile and uncertain. Together, the SO model and PaR are best suited to perform a net-benefit analysis for the Combined Projects that is consistent with long-standing least-cost, least-risk planning principles applied in PacifiCorp's IRP.

Q. How did PacifiCorp use PaR to assess stochastic system-cost risk associated with the Combined Projects?

A. Just as it evaluates resource portfolio alternatives in the IRP, PacifiCorp uses the stochastic-mean PVRR and risk-adjusted PVRR, calculated from PaR study results, to assess the stochastic system cost risk of the Combined Projects. With Monte Carlo sampling of stochastic variables, PaR produces a distribution of system variable costs. The stochastic-mean PVRR is the average of net variable operating costs from the distribution of system variable costs, combined with system fixed costs from the SO

model. PacifiCorp uses a risk-adjusted PVRR to evaluate stochastic system cost risk. The risk-adjusted PVRR incorporates the expected value of low-probability, high-cost outcomes. The risk-adjusted PVRR is calculated by adding five percent of system variable costs, from the 95th percentile of the distribution of system variable costs, to the stochastic-mean PVRR.

When applied to the analysis of the Combined Projects, the stochastic-mean PVRR represents the expected level of system costs from cases with and without the Wind Projects and the Transmission Projects. The risk-adjusted PVRR is used to assess whether the Combined Projects cause a disproportionate increase to system variable costs under low-probability, high-cost system conditions.

Q. Did PacifiCorp analyze how other assumptions affect its economic analysis of the Combined Projects?

A. Yes. In addition to assessing stochastic system cost risk, PacifiCorp analyzed the Combined Projects under a range of assumptions regarding wholesale market prices and CO_2 policy ("price-policy") assumptions. These assumptions drive NPC-related benefits, and so it is important to understand how the net-benefit analysis is affected under a range of potential outcomes. PacifiCorp developed low, medium, and high scenarios for the market price of electricity and natural gas and zero, medium, and high CO_2 price scenarios. Each pair of model simulations—with and without the Combined Projects, in both the SO model and PaR—was analyzed under each combination of these price-policy assumptions. I summarize the assumptions for each price-policy scenario later in my testimony.

PacifiCorp also completed two sensitivity studies to assess how certain factors affect the net benefits of the Combined Projects. The first sensitivity quantifies how the net benefits of the Combined Projects are affected by the depreciable life assumed for the new Wind Projects. PacifiCorp's base analysis assumes a 30-year depreciable life when calculating revenue requirement associated with the Wind Projects. Considering that wind facilities with modern equipment might continue operating over a longer period, this sensitivity quantifies the economic impact if the depreciable life of the Wind Projects were reset at 40 years.

The second sensitivity quantifies how the net benefits of the Combined Projects are affected when paired with the wind repowering project, the subject of a concurrent application. Consistent with PacifiCorp's wind repowering application, this sensitivity assumes approximately 999 MW of existing wind resource capacity is upgraded with modern equipment in the 2019-to-2020 time frame.

Q. How much new Wyoming wind capacity did PacifiCorp analyze in its economic analysis of the Combined Projects for this Application?

A. PacifiCorp assumed approximately 1,180 MW of new Wyoming wind resources for all SO model and PaR simulations that include the Combined Projects. As described by Mr. Teply, this includes approximately 860 MW from the Wind Projects, which can achieve commercial operation by year-end 2020. The remaining 320-MW balance of new wind resource capacity is associated with certain qualifying facility projects (the "QF Projects") that are located in the Aeolus area, have executed PPAs with PacifiCorp, and have preferential positions in the transmission interconnection queue. The QF Projects are reasonably expected to interconnect with PacifiCorp's transmission system

after the Aeolus-to-Bridger/Anticline Line is placed in service and are assumed to achieve commercial operation at the end of 2021, consistent with the terms in their PPAs. Because the QF Projects are not expected to be able to interconnect with PacifiCorp's transmission system without the Aeolus-to-Bridger/Anticline Line, they are only included in the SO model and PaR simulations that include the Combined Projects.

Q. Why is the total capacity of the new Wyoming wind resources included in PacifiCorp's economic analysis of the Combined Projects different from the capacity included in the 2017 IRP preferred portfolio?

A. As discussed in the testimony of Mr. Teply, PacifiCorp is seeking approvals for the specific wind projects that it will offer as benchmark resources in the 2017R RFP. This includes three projects (Ekola Flats, TB Flats I, and TB Flats II) being developed by a third party totaling approximately 750 MW and a fourth, 110-MW project (McFadden Ridge II), which PacifiCorp is developing on a site it controls. The capacity of the specific Wind Projects that will be offered as benchmark resources in the 2017R RFP (approximately 860 MW), when combined with the total capacity of the QF Projects (320 MW), totals 1,180 MW. This level of procurement is consistent with PacifiCorp's 2017 IRP action item to procure *at least* 1,100 MW of Wyoming wind resources. PacifiCorp will evaluate the level of Wyoming wind resource procurement that will maximize customer benefits, up to approximately 1,270 MW of new resource interconnections enabled by the Aeolus-to-Bridger/Anticline Line, based on specific bids submitted in response to the 2017R RFP.

Q. What key assumptions did PacifiCorp update since analyzing the new Wyoming wind resources and the Aeolus-to-Bridger/Anticline Line in its 2017 IRP?

A. Beyond the price-policy assumptions used to analyze a range of NPC-related benefits, PacifiCorp's economic analysis reflects updated assumptions for up-front capital costs, run-rate operating costs, and energy output specific to the Wind Projects and QF Projects described earlier in my testimony. PacifiCorp's analysis assumes an up-front capital investment for the Wind Projects totaling approximately [redacted] and are assumed to operate at a capacity-weighted-average-annual capacity factor of [redacted]. The PPA price paid to the QF Projects add [redacted] to total-system NPC beginning 2022, rising to [redacted] by the end of their contract terms in 2041. The QF Projects are assumed to operate at an aggregate capacity factor of 40.7 percent. The cost and performance assumptions for the Wind Projects and the QF Projects studied for this application are summarized in Confidential Exhibit RMP___(RTL-1).

The up-front capital investment for the Aeolus-to-Bridger/Anticline Line is [redacted], consistent with the capital cost assumed in PacifiCorp's 2017 IRP. The assumed up-front capital investment for the 230 kV Network Upgrades, reflecting costs to interconnect the Wind Projects, total [redacted]. The cost and performance assumptions for the Transmission Projects studied for this application are also summarized in Confidential Exhibit RMP___(RTL-1).

Q. Does PacifiCorp assume that all of the up-front capital costs of the Transmission Projects will be paid by its retail customers?

A. No. While the up-front capital cost of the Transmission Projects will contribute to retail-customer rate base, the revenue requirement for these investments will be

partially offset by incremental revenue from other transmission customers. The up-front transmission costs will flow into PacifiCorp's formula transmission rate under its Open Access Transmission Tariff ("OATT") and generate revenue credits that offset costs for retail customers.

PacifiCorp's merchant function, which uses PacifiCorp's transmission system to serve retail-customer load and to manage retail-customer NPC through off-system market sales and purchases, is the largest user of PacifiCorp's transmission system. However, other transmission customers pay OATT-based transmission rates that generate revenue credits and offset the cost of PacifiCorp's transmission revenue requirement. As discussed in Mr. Vail's testimony, the Transmission Projects are considered network transmission assets under PacifiCorp's OATT and therefore will be given rolled-in treatment under PacifiCorp's transmission formula rate. Over recent history, these revenue credits have accounted for approximately 12 percent of PacifiCorp's transmission revenue requirement. Based on this recent history, PacifiCorp's analysis assumes its retail customers pay 88 percent of the revenue requirement from the up-front capital cost for the Transmission Projects after accounting for an assumed 12 percent revenue credit from other transmission customers.

Q. How did PacifiCorp model de-rates to its Wyoming 230 kV transmission system when evaluating the Combined Projects?

A. In its final 2017 IRP resource-portfolio screening process, PacifiCorp identified and quantified reliability benefits associated with the Aeolus-to-Bridger/Anticline Line. This new transmission project will eliminate de-rates caused by outages on 230 kV

transmission-system elements. Historical outages on this part of PacifiCorp's transmission system indicate an average de-rate of 146 MW over approximately 88 outage days per year, which equates to approximately one 146-MW, twenty-four hour outage every four days. Without knowing when these events might occur, de-rates on the existing 230 kV transmission system were captured in the SO model and PaR as a 36.5 MW reduction in the transfer capability from eastern Wyoming to the Aeolus area. In simulations that include the Combined Projects, this de-rate assumption was eliminated when the new transmission assets are placed in service at the end of October 2020.

Q. How did PacifiCorp model line-loss benefits associated with the Transmission Projects when performing its economic analysis of the Combined Projects?

A. Line-loss benefits are only applicable in those simulations where the Transmission Projects are built and therefore were only considered in the simulations that include the Combined Projects. When the Aeolus-to-Bridger/Anticline Line is added in parallel to the existing transmission lines, resistance is reduced, which lowers line losses. With reduced line losses, an incremental 11.6 average MW ("aMW") of energy, which equates to approximately 102 gigawatt hours ("GWh"), will be able to flow out of eastern Wyoming each year. The line-loss benefit was reflected in the SO model and PaR by reducing northeast Wyoming load by approximately 11.6 aMW each year.

Q. Did PacifiCorp analyze potential EIM benefits in its economic analysis of the Combined Projects?

A. Yes. In its final 2017 IRP resource-portfolio screening process, PacifiCorp described how the EIM can provide potential benefits when incremental energy is added to

transmission-constrained areas of Wyoming. Unscheduled or unused transmission from participating EIM entities enables more efficient power flows within the hour. With increasing participation in the EIM, there will be increasing opportunities to move incremental energy from Wyoming to offset higher-priced generation in the PacifiCorp system or other EIM participants' systems. The more efficient use of transmission that is expected with growing participation in the EIM was captured in the economic analysis of the Combined Projects by increasing the transfer capability between the east and west sides of PacifiCorp's system by 300 MW (from the Jim Bridger plant to south-central Oregon). The ability to more efficiently use intra-hour transmission from a growing list of EIM participants is not driven by the Combined Projects; however, this increased connectivity provides the opportunity to move low-cost incremental energy out of transmission-constrained areas of Wyoming.

ANNUAL REVENUE REQUIREMENT MODELING METHODOLOGY

Q. In addition to the system modeling used to calculate present-value net benefits over a 20-year planning period, has PacifiCorp forecasted the change in nominal revenue requirement due to the Combined Projects?

A. Yes. The system PVRR from the SO model and PaR was calculated from an annual stream of forecasted revenue requirement over a 20-year time frame, consistent with the planning period in the IRP. The annual stream of forecasted revenue requirement captures nominal revenue requirement for non-capital items (*i.e.*, NPC, fixed operations and maintenance, etc.) and levelized revenue requirement for capital expenditures. To estimate the annual revenue-requirement impacts of the Combined

Projects, capital costs for the Wind Projects and the Transmission Projects need to be considered in nominal terms (*i.e.*, not levelized).

Q. Why is the capital revenue requirement used in the calculation of the system PVRR from the SO model and PaR levelized?

A. Levelization of capital revenue requirement is necessary in these models to avoid potential distortions in the economic analysis of capital-intensive assets that have different lives and in-service dates. Without levelization, this potential distortion is driven by how capital costs are included in rate base over time. Capital revenue requirement is generally highest in the first year an asset is placed in service and declines over time as the asset depreciates.

Consider the potential implications of modeling nominal capital revenue requirement for a future generating resource needed in 2036, the last year of the 2017 IRP planning period. If nominal capital revenue requirement were assumed, the model would capture in its economic assessment of resource alternatives the highest, first-year revenue requirement capital cost without having any foresight into the potential benefits that resource would provide beyond 2036. If nominal capital costs were applied, the model's economic assessment of resource alternatives for the 2036 resource need would inappropriately favor less capital-intensive projects or projects having longer asset lives, even if those alternatives would increase system costs over their remaining life. Levelized capital costs for assets that have different lives and in-service dates is an established way to address these types of distortions in the comparative economic analysis of resource alternatives.

Q. How did PacifiCorp forecast the annual revenue-requirement impacts of the Combined Projects?

A. In the simulations that include the Combined Projects, the annual stream of costs for the Wind Projects, including levelized capital and PTCs, the QF Projects, and the Transmission Projects are temporarily removed from the annual stream of costs used to calculate the stochastic-mean PVRR. The differential in the remaining stream of annual costs, which includes all system costs except for those associated with the Combined Projects and the QF Projects, represents the net system benefit caused by the Combined Projects.

These data are disaggregated to isolate the estimated annual NPC benefits, other non-NPC variable-cost benefits (*i.e.*, variable operations and maintenance and emissions costs for those scenarios that include a CO_2 price assumption), and fixed-cost benefits. To complete the annual revenue-requirement forecast, the change in costs for the Combined Projects and the QF Projects, including nominal capital revenue requirement and PTCs, are added back in with the annual system net benefits caused by the Combined Projects.

Q. Over what time frame did PacifiCorp estimate the change in annual revenue requirement due to the Combined Projects?

A. The change in annual revenue requirement was estimated through 2050. This captures the full 30-year life of the Wind Projects.

Q. What is the assumed life of the Transmission Projects?

A. PacifiCorp assumed a 62-year life for the Transmission Projects. The Transmission Projects will continue to provide system benefits well beyond 2050 when the Wind

Projects are fully depreciated. These additional benefits are not reflected in PacifiCorp's economic analysis.

Q. How did PacifiCorp calculate the annual net benefits caused by the Combined Projects beyond the 20-year forecast period used in PaR?

A. The PaR-forecast period runs from 2017 through 2036. The change in net system benefits caused by the Combined Projects over the 2028-through-2036 time frame, expressed in dollars-per-MWh of incremental energy output from the Wind Projects and the QF Projects, were used to estimate the change in net system benefits from 2037 through 2050. This calculation was performed in several steps.

First, the net system benefits caused by the Combined Projects were divided by the change in incremental energy expected from the Wind Projects and the QF Projects, as modeled in PaR over the 2028-through-2036 time frame. Next, the net system benefits per MWh of incremental energy from the Wind Projects and the QF Projects over the 2028-through-2036 time frame were levelized. These levelized results were extended out through 2050 at inflation. The levelized net system benefits per MWh of incremental energy output from the Wind Projects and the QF Projects over the 2037-through-2050 time frame were then multiplied by the change in incremental energy output from the Wind Projects and the QF Projects over the same period.

Q. Why did PacifiCorp use PaR results from the 2028-through-2036 time frame to extend system cost impacts out through 2050?

A. Consistent with the 2017 IRP, PacifiCorp's economic analysis of the Combined Projects assumes the Dave Johnston coal plant, located in eastern Wyoming, retires at the end of 2027. When this plant is assumed to retire, transmission congestion affecting

energy output from resources in eastern Wyoming, where the Wind Projects and the QF Projects are located, is reduced. The incremental energy output from the Wind Projects and the QF Projects provides more system benefits when not constrained by transmission limitations. Consequently, the net-system benefits caused by the Combined Projects over the 2028-through-2036 time frame, after Dave Johnston is assumed to retire, is representative of net system benefits that could be expected beyond 2036.

Q. Did PacifiCorp calculate a PVRR(d) for the Combined Projects using its estimate of annual revenue requirement impacts projected out through 2050?

A. Yes.

PRICE-POLICY SCENARIOS

Q. Please explain why price-policy scenarios are important when analyzing the Combined Projects.

A. Wholesale-power prices, often set by natural-gas prices, and the system cost impacts of potential CO_2 policies influence the forecast of net system benefits from the Combined Projects. Wholesale-power prices and CO_2 policy outcomes affect the value of system energy, the dispatch of system resources, and PacifiCorp's resource mix. Consequently, wholesale-power prices and CO_2 policy assumptions affect the NPC benefits, non-NPC variable-cost benefits, and system fixed-cost benefits of the Combined Projects. Because wholesale-power prices and CO_2 policy outcomes are both uncertain and important drivers to the economic analysis, PacifiCorp studied the economics of the Combined Projects under a range of different price-policy scenarios.

Q. What price-policy scenarios did PacifiCorp use in its economic analysis of the Combined Projects?

A. PacifiCorp analyzed the Combined Projects under nine different price-policy scenarios. PacifiCorp developed three wholesale-power price scenarios (low, medium, and high), and similarly developed three CO_2 policy scenarios (zero, medium, and high). The nine price-policy scenarios developed for the economic analysis of the Combined Projects reflect different combinations of these scenario assumptions.

Considering that there is a high level of correlation between wholesale-power prices and natural-gas prices, the wholesale-power price scenarios were based on a range of natural-gas price assumptions. This ensures consistency between power price and natural-gas price assumptions for each scenario. PacifiCorp implemented its CO_2 policy assumptions through a CO_2 price, expressed in dollars-per-ton.

While it is unlikely that the CPP will be implemented in its current form, it is possible that future CO_2 policies targeting electric-sector emissions could be adopted and impose incremental costs to drive emissions reductions. CO_2 price assumptions used in the price-policy scenarios are not intended to mimic a specific type of policy mechanism (*i.e.*, a tax or an allowance price under a cap-and-trade program), but are intended to recognize that there might be future CO_2 policies that impose a cost to reduce emissions. Table 1 summarizes the nine price-policy scenarios used to analyze the Combined Projects.

Table 1. Price-Policy Scenarios

Price-Policy Scenario	Natural-Gas Prices (Levelized $/MMBtu)*	CO_2 Price Description
Low Gas, Zero CO_2	$3.19	$0/ton
Low Gas, Medium CO_2	$3.19	$3.41/ton in 2025 growing to $14.40/ton in 2036
Low Gas, High CO_2	$3.19	$4.73/ton in 2025 growing to $38.42/ton in 2036
Medium Gas, Zero CO_2	$4.07	$0/ton
Medium Gas, Medium CO_2	$4.13	$3.41/ton in 2025 growing to $14.40/ton in 2036
Medium Gas, High CO_2	$4.13	$4.73/ton in 2025 growing to $38.42/ton in 2036
High Gas, Zero CO_2	$5.83	$0/ton
High Gas, Medium CO_2	$5.83	$3.41/ton in 2025 growing to $14.40/ton in 2036
High Gas, High CO_2	$5.83	$4.73/ton in 2025 growing to $38.42/ton in 2036
*Nominal levelized Henry Hub natural-gas price from 2018 through 2036.		

Q. Please describe the natural-gas price assumptions used in the price-policy scenarios.

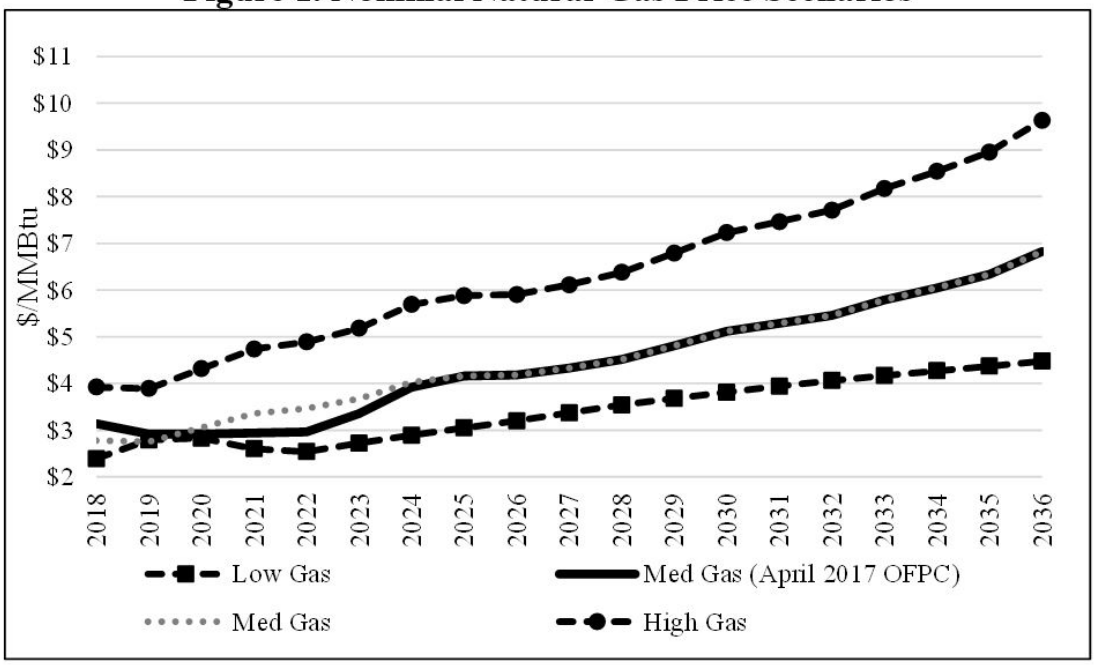
A. The medium-natural-gas-price assumptions that are paired with zero CO_2 prices reflect natural-gas prices from PacifiCorp's official forward price curve ("OFPC") dated April 26, 2017. The OFPC uses observed forward market prices as of April 26, 2017, for 72 months, followed by a 12-month transition to natural-gas prices based on a forecast developed by [redacted]. The low-, medium-, and high-natural-gas price assumptions used for all other scenarios were chosen after reviewing a range of credible third-party forecasts developed by [redacted], and the U.S. Department of Energy's Energy Information Administration. Exhibit RMP___(RTL-2) shows the range in natural-gas price assumptions from these third-party forecasts relative to those adopted for the price-policy scenarios to evaluate the Combined Projects.

The low-natural-gas price assumption was derived from a low-price scenario developed by [redacted], which is based on surging growth in price-inelastic associated gas,

technology improvements, stagnant liquefied-natural-gas exports, and an ever-expanding resource base. The medium-natural-gas price assumption, which is used beyond month 84 in the April 2017 OFPC, and in all months when medium-natural-gas prices are paired with medium or low CO_2 price assumptions, is based on a base-case forecast from [redacted] that is reasonably aligned with other base-case forecasts. The high-natural-gas price assumption was based on a high-price scenario from [redacted]. The high-price scenario is based on risk-aversion, whereby natural-gas developers are reluctant to commit capital before demand, and the associated price response, materializes. This gives rise to exaggerated boom-bust cycles (cyclical periods of high prices and low prices). PacifiCorp smoothed the boom-bust cycle in the third party's high-price scenario because the specific timing of these cycles are extremely difficult to project with reasonable accuracy.

Figure 1 shows Henry Hub natural-gas price assumptions from the April 2017 OFPC, low-, medium-, and high-natural-gas price scenarios. The April 2017 OFPC forecast only differs from the medium-natural-gas-price assumption in that it reflects observed-market forwards through the first 72 months followed by a twelve-month transition to [redacted]'s base-case forecast.

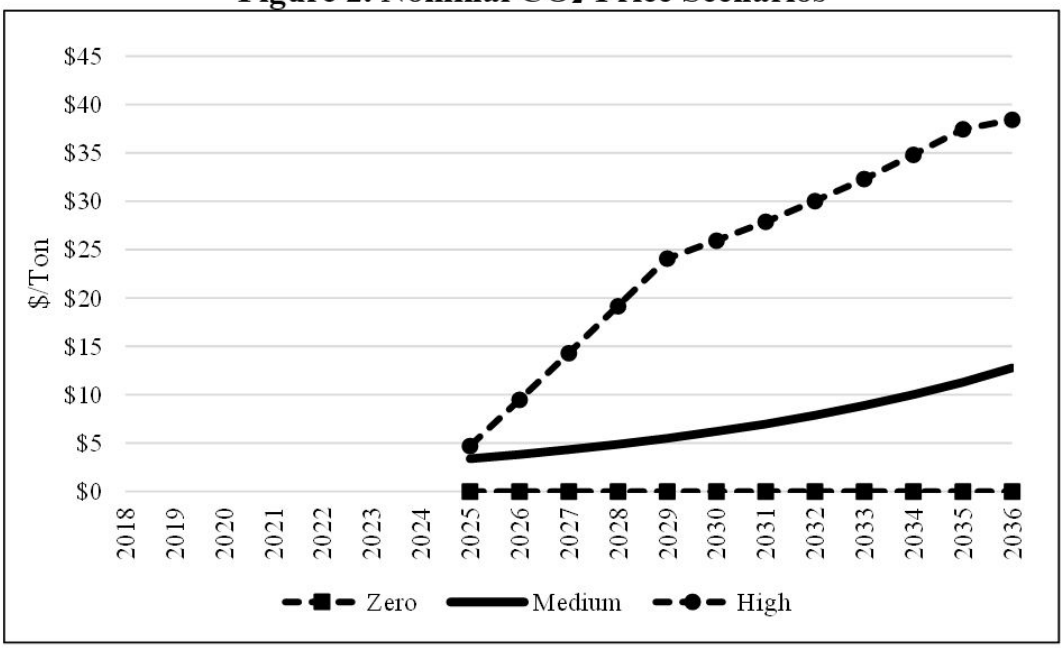
Figure 1. Nominal Natural-Gas Price Scenarios



Q. Please describe the CO_2 price assumptions used in the price-policy scenarios.

A. As with natural-gas prices, the medium- and high-CO_2 price assumptions are based on third-party projections from [redacted] and [redacted]. Both forecasters assume CO_2 prices start in 2025. To bracket the low end of potential-policy outcomes, PacifiCorp assumes there are no future policies adopted that would require incremental costs to achieve emissions reductions in the electric sector. In this scenario, the assumed CO_2 price is zero. Figure 2 shows the three CO_2 price assumptions used to analyze the Combined Projects.

Figure 2. Nominal CO_2-Price Scenarios



SYSTEM MODELING PRICE-POLICY RESULTS

Q. Please summarize the PVRR(d) results calculated from the SO model and PaR through 2036.

A. Table 2 summarizes the PVRR(d) results for each price-policy scenario. The PVRR(d) between cases with and without the Combined Projects are shown from the SO model and from PaR, which was used to calculate both the stochastic-mean PVRR(d) and the risk-adjusted PVRR(d). The data that was used to calculate the PVRR(d) results shown in the table are provided as Exhibit RMP___(RTL-3).

Table 2. SO Model and PaR PVRR(d) (Benefit)/Cost of the Combined Projects ($ million)

Price-Policy Scenario	SO Model PVRR(d)	PaR Stochastic-Mean PVRR(d)	PaR Risk-Adjusted PVRR(d)
Low Gas, Zero CO_2	$121	$77	$74
Low Gas, Medium CO_2	$73	$32	$26
Low Gas, High CO_2	($84)	($133)	($147)
Medium Gas, Zero CO_2	($19)	($57)	($66)
Medium Gas, Medium CO_2	($85)	($111)	($124)
Medium Gas, High CO_2	($156)	($224)	($242)
High Gas, Zero CO_2	($304)	($260)	($280)
High Gas, Medium CO_2	($318)	($272)	($293)
High Gas, High CO_2	($396)	($409)	($437)

Over a 20-year period, the Combined Projects reduce customer costs in seven out of nine price-policy scenarios price-policy scenarios. This trend occurs in the PVRR(d) calculated from both the SO model and PaR. The only price-policy scenarios without net customer benefits are those assuming the lowest natural-gas prices when paired with either medium or zero-CO_2 price assumptions. Under the central price-policy scenario, assuming medium-natural-gas prices and medium-CO_2 prices, the PVRR(d) benefits range between $85 million, when based upon SO model results, and $124 million, when based upon PaR-risk-adjusted results.

The PVRR(d) results show that the benefits of the Combined Projects increase with natural-gas prices and CO_2 prices, which increase NPC and other system variable cost benefits.

Q. Is there incremental customer upside to the PVRR(d) results calculated from the SO and PaR models through 2036?

A. Yes. The PVRR(d) results presented in Table 2 do not reflect the potential value of RECs generated by the incremental wind energy output from the Wind Projects. Customer benefits for all price-policy scenarios would improve by approximately $26

million for every dollar assigned to the incremental RECs that will be generated from the Wind Projects through 2036. Beyond potential REC-revenue benefits, the economic analysis of the Combined Projects does not reflect PacifiCorp's enhanced ability to comply with mandated reliability and performance standards the opportunity for further increases to the transfer capability across the Aeolus-to-Bridger/Anticline Line with the construction of additional segments of the Energy Gateway project.

Q. Why do the PaR results tend to show a different level of benefits from Combined Projects when compared to the results from the SO model?

A. The two models assess the system impacts of the Combined Projects in different ways. The SO model is designed to dynamically assess system dispatch, with less granularity than PaR, while optimizing the selection of resources to the portfolio over time. PaR is able to dynamically assess system dispatch, with more granularity than the SO model and with consideration of stochastic risk variables; however, PaR does not modify the type, timing, size and location of resources in the portfolio in response to its more detailed assessment of system dispatch.

Q. Does one of these two models provide a better assessment of the Combined Projects relative to the other?

A. No. The two models are simply different, and both are useful in establishing a range of benefits from the Combined Projects through the 20-year forecast period. Importantly, the PVRR(d) results from both models show customer benefits across all price-policy scenarios with consistent trends in the difference in PVRR(d) results between price-policy scenarios. The consistency in the trend of forecasted benefits between the two models, each having its own strengths, shows that the benefits from the Combined

Projects are robust across a range of price-policy assumptions and when analyzed using different modeling tools.

Q. How do the risk-adjusted PVRR(d) results compare to the stochastic-mean PVRR(d) results?

A. The risk-adjusted PVRR(d) results consistently show a slight increase in the benefits of the Combined Projects when compared to the stochastic-mean PVRR(d) results. This indicates that the Combined Projects reduce the risk of high-cost, low-probability outcomes that can occur due to volatility in stochastic variables like load, wholesale-market prices, hydro generation, and thermal-unit outages.

ANNUAL REVENUE REQUIREMENT PRICE-POLICY RESULTS

Q. Please summarize the PVRR(d) results calculated from the change in annual revenue requirement through 2050.

A. Table 3 summarizes the PVRR(d) results for each price-policy scenario calculated off of the change in annual nominal revenue requirement through 2050. The annual data over the period 2017 through 2050 that was used to calculate the PVRR(d) results shown in the table are provided as Exhibit RMP___(RTL-4).

Table 3. Nominal Revenue Requirement PVRR(d) (Benefit)/Cost of the Combined Projects ($ million)

Price-Policy Scenario	Annual Revenue Requirement PVRR(d)
Low Gas, Zero CO_2	$174
Low Gas, Medium CO_2	$93
Low Gas, High CO_2	($194)
Medium Gas, Zero CO_2	($53)
Medium Gas, Medium CO_2	($137)
Medium Gas, High CO_2	($317)
High Gas, Zero CO_2	($341)
High Gas, Medium CO_2	($351)
High Gas, High CO_2	($595)

When calculated through 2050, which covers the 30-year life of the Wind Projects, the Combined Projects reduce customer costs in seven out of nine price-policy scenarios. The only price-policy scenarios without net customer benefits are those assuming the lowest natural-gas prices when paired with either medium or zero-CO_2 price assumptions. The PVRR(d) results show customer benefits under the price-policy scenario with low natural-gas prices and high-CO_2 prices, in all three of the medium-natural-gas price scenarios, and in all three of the high-natural-gas price scenarios. Under the central price-policy scenario, assuming medium-natural-gas prices and medium-CO_2 prices, the PVRR(d) benefit is $137 million.

Consistent with the PVRR(d) results calculated from the SO model and PaR through 2036, the PVRR(d) results show that the benefits of the Combined Projects increase with natural-gas prices and CO_2 prices, which increase NPC and other system variable cost benefits.

Q. What causes the decrease in PVRR(d) benefits when calculated off of nominal revenue requirement through 2050 relative to the PVRR(d) results calculated from the SO model and PaR results through 2036?

A. The PVRR(d) calculated from estimated annual revenue requirement through 2050 reflects reduced incremental wind energy output beginning in 2042 after the QF Projects' PPAs end. Confidential Figure 3 shows the incremental change in wind energy output from the Wind Projects and the QF Projects. Incremental energy output associated with the Combined Projects is steady at approximately [redacted] GWh over the 2022-through-2041 period. Beyond 2041, energy output is approximately [redacted] GWh—[redacted]. This

reduction in incremental wind energy output reduces NPC benefits and other system variable costs benefits over the last nine years of the PVRR(d) calculated off the change in nominal revenue requirement estimates through 2050. Consequently, the PVRR(d) calculated off the change in nominal revenue requirement through 2050 does not capture likely benefits associated with a potential extension of the QF Projects' PPAs or incremental procurement of additional Wyoming wind resources after the term of these PPAs end.

Confidential Figure 3. Change Incremental Wind Energy Output from the Wind Projects and QF Projects (GWh)

[redacted]

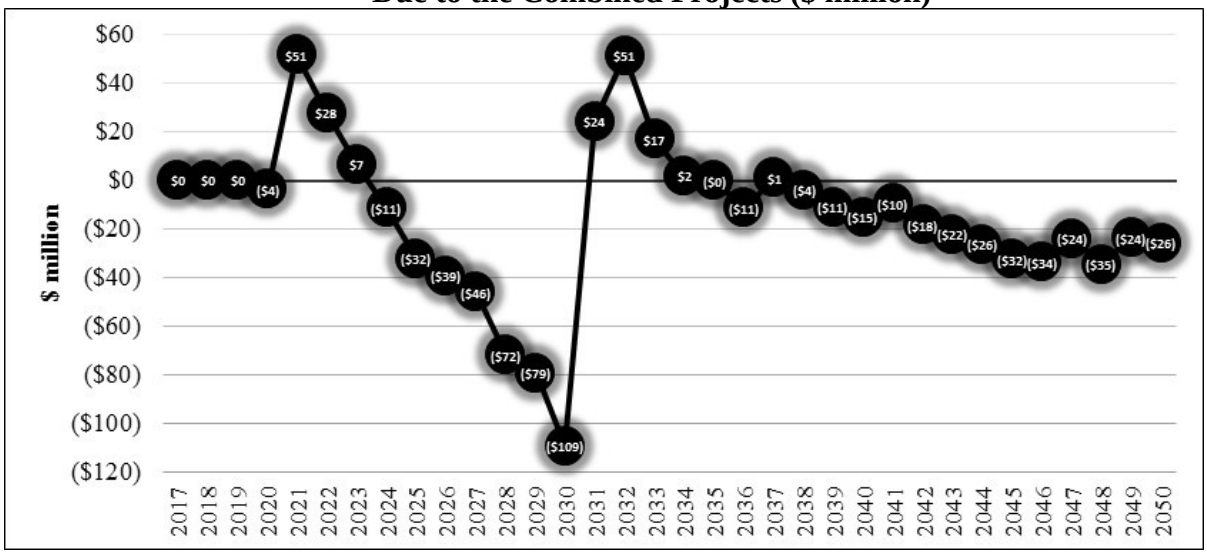
Q. Is there incremental customer upside to the PVRR(d) results calculated from the change in estimated annual revenue requirement through 2050?

A. Yes. As in the case with the PVRR(d) results calculated from the SO model and PaR results through 2036, the PVRR(d) results presented in Table 3 do not reflect the potential value of RECs produced by the Wind Projects. Customer benefits for all price-policy scenarios would improve by approximately $34 million for every dollar assigned to the incremental RECs that will be generated from the Wind Projects through 2050.

Q. Please describe the change in annual nominal revenue requirement from the Combined Projects.

A. Figure 4 shows the estimated change in annual nominal-revenue requirement due to the Combined Projects for the medium-natural-gas and medium-CO_2-price-policy scenario on a total-system basis. The annual revenue requirement shown in the figure reflects all costs for the Combined Projects, including capital revenue requirement (*i.e.*, depreciation, return, income taxes, and property taxes) net of transmission revenue credits, operations and maintenance expenses, the Wyoming wind-production tax, incremental wind integration costs, and PTCs. The project costs are netted against system impacts of the Combined Projects, reflecting the change in NPC, emissions, non-NPC variable costs, and system fixed costs that are affected by, but not directly associated with, the Combined Projects.

Figure 4. Total-System Change in Annual Revenue Requirement Due to the Combined Projects ($ million)



In the initial year the Combined Projects come online, net system benefits offset partial-year capital revenue requirement. In 2021, the first full year the Combined Projects are in service, the change in total-system nominal revenue requirement

increases by $51 million. This figure rapidly declines and crosses over from a net increase in nominal revenue requirement to a decrease in nominal revenue requirement beginning 2024—just four years after the first full year of operation. The net revenue requirement benefits persist and grow through 2030 as PTC benefits increase with inflation and the new equipment continues to depreciate. On a total-system basis, the change in annual revenue requirement is down by $109 million in 2030—the last year the Wind Projects produce PTCs. After the PTCs expire, annual revenue requirement increases. However, as the assets continue to depreciate, the Combined Projects once again begin producing annual revenue requirement savings beginning 2036. These annual benefits persist through 2050.

SENSITIVITY STUDY RESULTS

Q. Please summarize the results of the sensitivity that assumes the Wind Projects have a 40-year-depreciable life.

A. Table 4 summarizes the PVRR(d) results for the sensitivity assuming a 40-year life for the Wind Projects. To assess the relative impact of the 40-year life, the PVRR(d) results were calculated through 2036 based on SO model and PaR results and are presented alongside the benchmark study in which the Combined Projects were evaluated assuming a 30-year life for the Wind Projects. Medium-natural-gas and medium-CO_2 price-policy assumptions were applied to this sensitivity.

Table 4. 40-Year-Life Sensitivity (Benefit)/Cost of the Combined Projects ($ million)

Model	Sensitivity PVRR(d)	Benchmark PVRR(d)	Change in PVRR(d)
SO Model	($106)	($85)	($21)
PaR Stochastic-Mean	($132)	($111)	($21)
PaR Risk-Adjusted	($145)	($124)	($21)

If the Wind Projects are depreciated over a 40-year life, reduced book depreciation would drive lower annual revenue requirement. In this sensitivity, PVRR(d) benefits increase by approximately $21 million relative to the benchmark case assuming a 40-year life for the Wind Projects.

Q. Please summarize the results of the sensitivity that analyzes the Combined Projects with wind repowering.

A. Table 5 summarizes the PVRR(d) results for the sensitivity assuming the Combined Projects are implemented along with wind repowering of approximately 999 MW of existing wind capacity. To assess the relative impact of wind repowering on the Combined Projects, the PVRR(d) results were calculated through 2036 based on SO model and PaR results and are presented alongside the benchmark study in which the Combined Projects were evaluated without repowering. Medium-natural-gas and medium-CO_2 price-policy assumptions were applied to this sensitivity.

Table 5. The Combined Projects with Wind Repowering Sensitivity (Benefit)/Cost ($ million)

Model	Sensitivity PVRR(d)	Benchmark PVRR(d)	Change in PVRR(d)
SO Model	($114)	($85)	($29)
PaR Stochastic-Mean	($104)	($111)	$8
PaR Risk-Adjusted	($116)	($124)	$8

When the Combined Projects are analyzed with the wind repowering project, PVRR(d) benefits increase by $29 million when assessed with the SO model. PaR shows a slight $8 million increase to the PVRR(d).

Q. Do the PaR results for this sensitivity indicate that the wind repowering project lowers customer benefits if implemented in parallel with the Combined Projects?

A. No. The sensitivity does not capture any of the incremental benefits from the wind repowering project that will occur just beyond the 2036 period, which is the last year

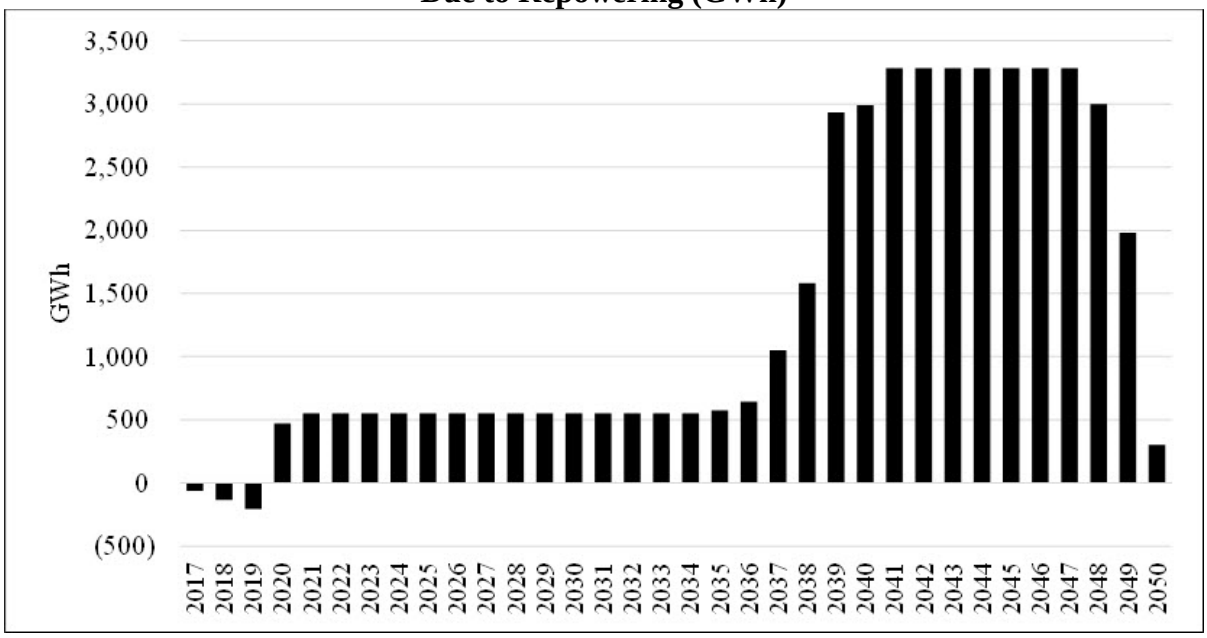
simulated in the SO model and PaR. Consequently, the PVRR(d) results from the SO model and PaR do not capture the significant increase in the benefits from repowering that is associated with increased incremental energy output that will occur beyond 2036.

The change in wind energy output between cases with and without repowering experiences a step change in the 2036-through-2040 time frame, when the wind facilities within the repowering project scope that were originally placed in-service during the 2006-through-2010 time frame would otherwise have hit the end of their depreciable life. Before the 2036-through-2040 time frame, the period captured in the PVRR(d) results summarized in Table 5, the change in wind energy output from repowering reflects the incremental energy production that results from installing modern equipment on repowered wind assets. Beyond the 2036-through-2040 time frame, a period that is not captured in the PVRR(d) results reported in Table 5, the change in wind energy output between a case with and without repowering reflects the full energy output from the repowered wind facilities that would otherwise be retired.

Figure 5 shows the incremental change in wind energy output resulting from the repowering project. Incremental energy output associated with wind repowering progressively increases over the 2036-through-2040 period, as wind facilities originally placed in service in the 2006-through-2010 time frame would have otherwise hit the end of their lives. Before 2036, and once all of the wind resources within the project scope are repowered, the average annual incremental increase in wind energy output is approximately 551 GWh. Beyond 2040, and before the new equipment hits the end of its depreciable life, the average annual incremental increase in wind energy output is

approximately 3,283 GWh. The value of this incremental wind-energy output associated with repowering adds substantial incremental benefits not reflected in the PVRR(d) results for this sensitivity that would more than offset the modest $8 million PVRR(d) incremental cost based on PaR results through 2036.

Figure 5. Change in Incremental Wind Energy Output Due to Repowering (GWh)



CONCLUSION

Q. Please summarize the conclusions of your testimony.

A. PacifiCorp's analysis supports proceeding with its planned investments in the Wind Projects and Transmission Projects. The Wind Projects, which are enabled by the Transmission Projects will: (1) qualify for ten years of federal PTCs; (2) produce zero-fuel-cost energy that will lower NPC; (3) generate RECs, which can be sold in the market to create additional revenues that would lower net customer costs; and (4) help to decarbonize PacifiCorp's resource portfolio, which mitigates long-term risk

associated with potential future state and federal policies targeting CO_2 emissions reductions from the electric sector.

The Transmission Projects will: (1) relieve congestion on the current transmission system in eastern Wyoming; (2) enable the additional wind resource interconnections; (3) provide critical voltage support to the Wyoming transmission network; (4) improve overall reliability of the transmission system and enhance PacifiCorp's ability to comply with mandated reliability and performance standards; (5) reduce line losses; and (6), create an opportunity for further increases to the transfer capability across the Aeolus-to-Bridger/Anticline Line with the construction of additional segments of the Energy Gateway project.

The economic analysis of the Combined Projects demonstrates that net benefits more than outweigh net project costs.

Q. What do you recommend?

A. As supported by PacifiCorp's economic analysis, I recommend that the Commission determine that PacifiCorp's decision to invest in the Wind Projects and the Transmission Projects is in the public interest and approve the Application as filed, including the proposed ratemaking treatment for the new costs and benefits of the Combined Projects.

Q. Does this conclude your direct testimony?

A. Yes.

REDACTED
Rocky Mountain Power
Exhibit RMP___(RTL-1)
Docket No. 17-035-40
Witness: Rick T. Link

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

REDACTED
Exhibit Accompanying Direct Testimony of Rick T. Link

Summary of the Cost and Performance Assumptions for the Wind Projects and the QF Projects Studied

June 2017

CONFIDENTIAL -- SUBJECT TO UTAH PUBLIC SERVICE COMMISSION RULES R746-1-602 and 603

Wind Resources

Facility Information and Up-front Capital

	Capacity (MW)	Annual Energy (GWh)	Capacity Factor	In-Service Capital ($m)	Date PTC Ends	End-of-Life or Term	Online Date
QF Projects	320.0	1,142	40.7%	$0.0	n/a	12/30/2041	12/31/2021
McFadden Ridge II	110.0	[redacted]			10/31/2030	10/31/2050	11/1/2020
Ekola Flats	250.5				10/31/2030	10/31/2050	11/1/2020
TB Flats I	250.5				10/31/2030	10/31/2050	11/1/2020
TB Flats II	250.5				10/31/2030	10/31/2050	11/1/2020
Total Wind Projects	861.5	[redacted]					
Total Wind Projects and QF Projects	1,181.5						

Run-Rate Capital ($m)

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Wind Projects	[redacted]											

	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Wind Projects	[redacted]											

	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Wind Projects	[redacted]									

Run-Rate Operations and Maintenance Expense ($m)

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Wind Projects	[redacted]											

	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Wind Projects	[redacted]											

	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Wind Projects	[redacted]									

Annual PPA Cost ($m)

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
QF Projects	[redacted]											

	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
QF Projects	[redacted]											

	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
QF Projects	[redacted]									

Transmission

Transfer Capability and Up-Front Capital ($m)

	In-Service Capital ($m)	Transfer Capacity (MW)
Aeolus-to-Bridger/Anticline Line	[redacted]	750
230 kV Network Upgrades		0
Total Transmission Projects		750

Run-Rate Operations and Maintenance Expense ($m)

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Aeolus-to-Bridger/Anticline Line	[redacted]											

	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Aeolus-to-Bridger/Anticline Line	[redacted]											

	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Aeolus-to-Bridger/Anticline Line	[redacted]									

Rocky Mountain Power
Exhibit RMP___(RTL-2)
Docket No. 17-035-40
Witness: Rick T. Link

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

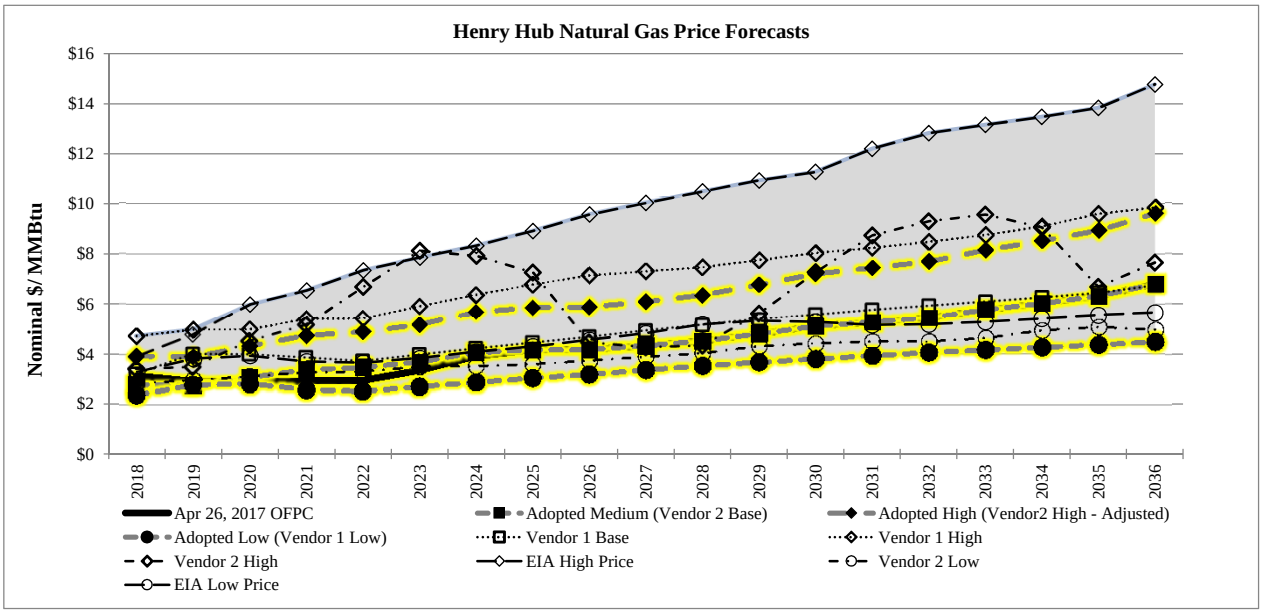
Exhibit Accompanying Direct Testimony of Rick T. Link

Nominal Henry Hub Natural Gas Price Forecasts ($/MMBtu)

June 2017

Nominal Henry Hub Natural Gas Price Forecasts ($/MMBtu)

Year	Apr 26, 2017 OFPC	Adopted Medium (Vendor 2 Base)	Adopted High (Vendor2 High - Adjusted)	Adopted Low (Vendor 1 Low)	Vendor 1 Base	Vendor 1 High	Vendor 2 High	EIA Low Price	EIA High Price	Vendor 2 Low	Lowest Price	Highest Price	Range
2018	$3.14	$2.80	$3.92	$2.39	$3.21	$4.71	$3.41	$3.29	$3.89	$2.85	$2.39	$4.71	$2.32
2019	$2.92	$2.77	$3.89	$2.79	$4.00	$4.97	$3.49	$3.82	$4.77	$2.98	$2.77	$4.97	$2.20
2020	$2.92	$3.08	$4.32	$2.83	$3.99	$4.98	$4.51	$3.94	$5.98	$3.12	$2.83	$5.98	$3.15
2021	$2.94	$3.38	$4.74	$2.60	$3.86	$5.41	$5.16	$3.71	$6.54	$3.28	$2.60	$6.54	$3.94
2022	$2.97	$3.48	$4.89	$2.54	$3.72	$5.43	$6.69	$3.66	$7.35	$3.31	$2.54	$7.35	$4.81
2023	$3.35	$3.69	$5.18	$2.72	$3.98	$5.93	$8.13	$3.84	$7.86	$3.51	$2.72	$7.86	$5.14
2024	$3.92	$4.06	$5.69	$2.89	$4.22	$6.39	$7.92	$4.10	$8.33	$3.53	$2.89	$8.33	$5.44
2025	$4.16	$4.16	$5.88	$3.05	$4.45	$6.80	$7.26	$4.31	$8.92	$3.60	$3.05	$8.92	$5.87
2026	$4.18	$4.18	$5.90	$3.20	$4.68	$7.16	$4.46	$4.57	$9.58	$3.74	$3.20	$9.58	$6.38
2027	$4.33	$4.33	$6.11	$3.37	$4.93	$7.33	$4.27	$4.84	$10.04	$3.90	$3.37	$10.04	$6.67
2028	$4.52	$4.52	$6.38	$3.54	$5.16	$7.49	$4.33	$5.20	$10.50	$4.04	$3.54	$10.50	$6.96
2029	$4.81	$4.81	$6.79	$3.68	$5.39	$7.77	$5.61	$5.34	$10.94	$4.32	$3.68	$10.94	$7.26
2030	$5.12	$5.12	$7.23	$3.81	$5.59	$8.05	$7.27	$5.30	$11.28	$4.42	$3.81	$11.28	$7.47
2031	$5.28	$5.28	$7.46	$3.94	$5.78	$8.26	$8.75	$5.17	$12.21	$4.51	$3.94	$12.21	$8.27
2032	$5.46	$5.46	$7.71	$4.06	$5.95	$8.50	$9.31	$5.20	$12.83	$4.50	$4.06	$12.83	$8.77
2033	$5.79	$5.79	$8.17	$4.17	$6.11	$8.77	$9.58	$5.30	$13.16	$4.64	$4.17	$13.16	$8.99
2034	$6.05	$6.05	$8.54	$4.27	$6.28	$9.11	$9.07	$5.43	$13.48	$4.94	$4.27	$13.48	$9.21
2035	$6.34	$6.34	$8.95	$4.37	$6.46	$9.61	$6.68	$5.56	$13.84	$5.08	$4.37	$13.84	$9.47
2036	$6.82	$6.82	$9.63	$4.48	$6.76	$9.86	$7.66	$5.66	$14.78	$4.97	$4.48	$14.78	$10.30



Rocky Mountain Power
Exhibit RMP___(RTL-3)
Docket No. 17-035-40
Witness: Rick T. Link

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

Exhibit Accompanying Direct Testimony of Rick T. Link

SO Model Annual Results ($ million)

June 2017

SO Model Annual Results ($ million)

Low Natural Gas, Zero CO2 Price-Policy Scenario

(Benefit)/Cost	*PVRR(d)*	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Cost of Projects	$1,174	$0	$0	$0	$17	$103	$129	$133	$140	$144	$147	$151	$167	$171	$172	$181	$185	$186	$187	$190	$198
Change in NPC	($311)	$0	$0	$1	($14)	($48)	($49)	($51)	($48)	($48)	($46)	($47)	($40)	($42)	($25)	($20)	($22)	($29)	($28)	($27)	($22)
Change in Emissions	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Change in DSM	($70)	$0	($0)	($1)	($2)	($4)	($6)	($7)	($8)	($9)	($9)	($10)	($12)	($10)	($10)	($11)	($11)	($11)	($11)	($11)	($11)
Change in System Fixed Cost	($672)	$0	$0	$0	($0)	($31)	($57)	($59)	($64)	($67)	($68)	($70)	($87)	($90)	($132)	($116)	($150)	($159)	($167)	($143)	($153)
Net (Benefit)/Cost	$121	$0	$0	($0)	$0	$20	$17	$16	$19	$20	$24	$23	$28	$30	$5	$33	$1	($13)	($19)	$8	$11

Low Natural Gas, Medium CO2 Price-Policy Scenario

(Benefit)/Cost	*PVRR(d)*	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Cost of Projects	$1,174	$0	$0	$0	$17	$103	$129	$133	$140	$144	$147	$151	$167	$171	$172	$181	$185	$186	$187	$190	$198
Change in NPC	($511)	$0	$0	$0	($16)	($49)	($52)	($55)	($52)	($54)	($53)	($54)	($49)	($53)	($69)	($64)	($70)	($100)	($106)	($158)	($136)
Change in Emissions	($29)	$0	$0	$0	$0	$0	$0	$0	$0	($4)	($5)	($5)	($5)	($9)	($2)	($1)	($2)	($5)	($9)	($13)	($16)
Change in DSM	($26)	$0	($0)	($0)	($0)	($1)	($2)	($2)	($2)	($2)	($2)	($4)	($4)	($4)	($4)	($6)	($6)	($6)	($6)	($6)	($6)
Change in System Fixed Cost	($536)	$0	$0	$0	($0)	($31)	($57)	($59)	($64)	($67)	($68)	($70)	($88)	($88)	($98)	($90)	($115)	($90)	($89)	($61)	($59)
Net (Benefit)/Cost	$73	$0	$0	$0	$1	$21	$19	$18	$22	$17	$19	$18	$21	$17	($1)	$19	($8)	($14)	($23)	($48)	($19)

Low Natural Gas, High CO2 Price-Policy Scenario

(Benefit)/Cost	*PVRR(d)*	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Cost of Projects	$1,174	$0	$0	$0	$17	$103	$129	$133	$140	$144	$147	$151	$167	$171	$172	$181	$185	$186	$187	$190	$198
Change in NPC	($361)	$0	$0	$0	($16)	($52)	($55)	($57)	($51)	($56)	($54)	($44)	($17)	($16)	($26)	($35)	($60)	($9)	($24)	($87)	($101)
Change in Emissions	($239)	$0	$0	$0	$0	$0	$0	$0	$0	($4)	($12)	($33)	($56)	($64)	($71)	($88)	($95)	($39)	($60)	($40)	($65)
Change in DSM	($6)	$0	$0	$0	$0	($1)	($1)	($1)	($1)	($1)	($1)	($1)	($1)	($1)	($1)	($1)	($1)	($1)	($1)	($1)	($3)
Change in System Fixed Cost	($651)	$0	$0	$0	($0)	($31)	($57)	($59)	($64)	($67)	($68)	($70)	($102)	($105)	($125)	($99)	($88)	($188)	($161)	($179)	($77)
Net (Benefit)/Cost	($84)	$0	$0	$0	$1	$20	$17	$17	$23	$17	$11	$2	($10)	($15)	($50)	($42)	($58)	($50)	($59)	($117)	($48)

OFPC Natural Gas, Zero CO2 Price-Policy Scenario

(Benefit)/Cost	*PVRR(d)*	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Cost of Projects	$1,174	$0	$0	$0	$17	$103	$129	$133	$140	$144	$147	$151	$167	$171	$172	$181	$185	$186	$187	$190	$198
Change in NPC	($492)	$0	$0	$0	($17)	($57)	($62)	($64)	($65)	($64)	($61)	($63)	($57)	($81)	($56)	($74)	($106)	($67)	($75)	$29	($95)
Change in Emissions	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Change in DSM	$16	$0	$0	$0	$1	$1	$1	$2	$2	$2	$2	$2	$2	$2	$3	$3	$3	$3	$3	$1	$4
Change in System Fixed Cost	($717)	$0	$0	$0	($0)	($31)	($57)	($59)	($64)	($67)	($68)	($70)	($107)	($120)	($173)	($122)	($80)	($143)	($142)	($266)	($172)
Net (Benefit)/Cost	($19)	$0	$0	$0	$1	$15	$12	$12	$13	$15	$20	$20	$5	($27)	($54)	($13)	$1	($20)	($27)	($46)	($66)

Medium Natural Gas, Medium CO2 Price-Policy Scenario

(Benefit)/Cost	*PVRR(d)*	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Cost of Projects	$1,174	$0	$0	$0	$17	$103	$129	$133	$140	$144	$147	$151	$167	$171	$172	$181	$185	$186	$187	$190	$198
Change in NPC	($615)	$0	$0	$0	($16)	($56)	($64)	($67)	($67)	($65)	($62)	($65)	($58)	($73)	($56)	($105)	($138)	($137)	($149)	($148)	($82)
Change in Emissions	($46)	$0	$0	$0	$0	$0	$0	$0	$0	($9)	($10)	($11)	($10)	($7)	($8)	($11)	($13)	($8)	($8)	($9)	($8)
Change in DSM	$27	$0	$0	$0	$0	$0	$0	$2	$2	$2	$2	$3	$3	$5	$6	$7	$7	$7	$7	$7	$7
Change in System Fixed Cost	($626)	$0	$0	$0	($0)	($31)	($57)	($60)	($64)	($67)	($68)	($71)	($107)	($110)	($178)	($120)	($54)	($92)	($91)	($99)	($184)
Net (Benefit)/Cost	($85)	$0	$0	$0	$1	$16	$9	$9	$10	$5	$9	$7	($5)	($14)	($64)	($48)	($14)	($43)	($54)	($60)	($69)

Medium Natural Gas, High CO2 Price-Policy Scenario

(Benefit)/Cost	*PVRR(d)*	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Cost of Projects	$1,174	$0	$0	$0	$17	$103	$129	$133	$140	$144	$147	$151	$167	$171	$172	$181	$185	$186	$187	$190	$198
Change in NPC	($454)	$0	$0	$1	($16)	($55)	($62)	($64)	($64)	($62)	($60)	($68)	($48)	($66)	($35)	($24)	($33)	($97)	($107)	($26)	($67)
Change in Emissions	($208)	$0	$0	$0	$0	$0	$0	$0	$0	($11)	($22)	($23)	($38)	($50)	($48)	($60)	($55)	($43)	($48)	($80)	($82)
Change in DSM	($40)	$0	$0	($1)	($1)	($2)	($2)	($3)	($3)	($4)	($4)	($4)	($5)	($5)	($6)	($7)	($8)	($9)	($11)	($13)	($16)
Change in System Fixed Cost	($628)	$0	$0	$0	($0)	($31)	($57)	($59)	($64)	($67)	($68)	($70)	($90)	($85)	($131)	($137)	($139)	($133)	($131)	($102)	($99)
Net (Benefit)/Cost	($156)	$0	$0	($0)	$0	$15	$8	$7	$9	($0)	($6)	($14)	($15)	($34)	($47)	($47)	($50)	($96)	($109)	($31)	($65)

High Natural Gas, Zero CO2 Price-Policy Scenario

(Benefit)/Cost	*PVRR(d)*	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Cost of Projects	$1,174	$0	$0	$0	$17	$103	$129	$133	$140	$144	$147	$151	$167	$171	$172	$181	$185	$186	$187	$190	$198
Change in NPC	($775)	$0	$0	$0	($22)	($74)	($91)	($87)	($94)	($92)	($88)	($91)	($89)	$21	($123)	($104)	($129)	($198)	($202)	($132)	($168)
Change in Emissions	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Change in DSM	$13	$0	($0)	($0)	($0)	$1	$1	$1	$1	$1	$1	$1	$0	$1	$2	$2	$2	$4	$5	$7	$7
Change in System Fixed Cost	($716)	$0	$0	$0	($0)	($31)	($57)	($67)	($71)	($74)	($76)	($78)	($94)	($226)	($104)	($132)	($115)	($115)	($127)	($167)	($149)
Net (Benefit)/Cost	($304)	$0	$0	$0	($6)	($2)	($18)	($19)	($25)	($22)	($16)	($17)	($15)	($32)	($53)	($53)	($57)	($122)	($137)	($101)	($113)

High Natural Gas, Medium CO2 Price-Policy Scenario

(Benefit)/Cost	*PVRR(d)*	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Cost of Projects	$1,174	$0	$0	$0	$17	$103	$129	$133	$140	$144	$147	$151	$167	$171	$172	$181	$185	$186	$187	$190	$198
Change in NPC	($804)	$0	$0	$1	($21)	($72)	($88)	($90)	($97)	($94)	($90)	($92)	($90)	($102)	($129)	($86)	($166)	($121)	($143)	($156)	($170)
Change in Emissions	($31)	$0	$0	$0	$0	$0	$0	$0	$0	($4)	($5)	($6)	($5)	($6)	($7)	($4)	($10)	($8)	($9)	($7)	($10)
Change in DSM	($61)	$0	($0)	($1)	($2)	($4)	($4)	($4)	($5)	($6)	($6)	($7)	($8)	($9)	($10)	($12)	($13)	($13)	($13)	($13)	($13)
Change in System Fixed Cost	($597)	$0	$0	$0	($0)	($31)	($57)	($59)	($64)	($67)	($68)	($70)	($87)	($86)	($88)	($145)	($56)	($138)	($127)	($125)	($126)
Net (Benefit)/Cost	($318)	$0	$0	($0)	($7)	($4)	($20)	($20)	($26)	($27)	($22)	($25)	($23)	($31)	($61)	($66)	($61)	($93)	($105)	($111)	($121)

High Natural Gas, High CO2 Price-Policy Scenario

(Benefit)/Cost	*PVRR(d)*	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Cost of Projects	$1,174	$0	$0	$0	$17	$103	$129	$133	$140	$144	$147	$151	$167	$171	$172	$181	$185	$186	$187	$190	$198
Change in NPC	($605)	$0	$0	$0	($23)	($76)	($92)	($93)	($98)	($97)	($93)	($85)	$7	($87)	($78)	($49)	($78)	($63)	($60)	($58)	($117)
Change in Emissions	($122)	$0	$0	$0	$0	$0	$0	$0	$0	($5)	($11)	($28)	($11)	($41)	($35)	($33)	($37)	($28)	($23)	($31)	($36)
Change in DSM	($18)	$0	$0	($0)	($0)	($0)	($0)	($0)	($2)	($2)	($2)	($3)	($4)	($4)	($4)	($4)	($4)	($4)	($4)	($4)	($4)
Change in System Fixed Cost	($826)	$0	$0	$0	($0)	($31)	($57)	($59)	($64)	($67)	($68)	($70)	($197)	($88)	($126)	($188)	($141)	($196)	($214)	($219)	($264)
Net (Benefit)/Cost	($396)	$0	$0	$0	($6)	($4)	($20)	($20)	($24)	($27)	($27)	($35)	($37)	($48)	($70)	($94)	($75)	($105)	($115)	($122)	($223)

PaR Stochastic-Mean Results ($ million)

Low Natural Gas, Zero CO2 Price-Policy Scenario

(Benefit)/Cost	*PVRR(d)*	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Cost of Projects	$1,174	$0	$0	$0	$17	$103	$129	$133	$140	$144	$147	$151	$167	$171	$172	$181	$185	$186	$187	$190	$198
Change in NPC	($340)	$0	$0	$1	($15)	($54)	($55)	($54)	($50)	($53)	($50)	($51)	($44)	($44)	($22)	($18)	($19)	($38)	($36)	($32)	($31)
Change in Emissions	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Change in VOM	($19)	$0	$0	$0	($0)	($1)	($1)	($1)	($2)	($2)	($2)	($2)	($1)	($1)	($9)	($10)	($10)	($1)	($0)	($0)	($1)
Change in DSM	($76)	$0	($0)	($1)	($2)	($5)	($6)	($7)	($9)	($9)	($10)	($11)	($12)	($11)	($11)	($12)	($12)	($12)	($12)	($12)	($13)
Change in Deficiency	($2)	$0	$0	($0)	$0	$0	$0	($0)	$0	($0)	$0	$0	($0)	($0)	($0)	($1)	$0	$0	($3)	($1)	($2)
Change in System Fixed Cost	($660)	$0	$0	$0	($0)	($31)	($56)	($58)	($63)	($65)	($66)	($69)	($85)	($87)	($130)	($114)	($147)	($157)	($165)	($141)	($151)
Net (Benefit)/Cost	$77	$0	($0)	($1)	($1)	$12	$11	$12	$17	$15	$19	$19	$25	$28	($0)	$26	($4)	($21)	($30)	$3	$1

Low Natural Gas, Medium CO2 Price-Policy Scenario

(Benefit)/Cost	*PVRR(d)*	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Cost of Projects	$1,174	$0	$0	$0	$17	$103	$129	$133	$140	$144	$147	$151	$167	$171	$172	$181	$185	$186	$187	$190	$198
Change in NPC	($536)	$0	$0	$0	($17)	($57)	($58)	($57)	($53)	($60)	($57)	($58)	($51)	($54)	($66)	($64)	($67)	($103)	($112)	($156)	($144)
Change in Emissions	($40)	$0	$0	$0	$0	$0	$0	$0	$0	($5)	($6)	($7)	($10)	($11)	($2)	($2)	($4)	($9)	($11)	($19)	($22)
Change in VOM	($15)	$0	$0	$0	($0)	($1)	($1)	($1)	($2)	($1)	($1)	($1)	($1)	($2)	($7)	($6)	($7)	$1	$0	($1)	($1)
Change in DSM	($28)	$0	($0)	($0)	($0)	($2)	($2)	($2)	($2)	($2)	($3)	($4)	($4)	($4)	($5)	($6)	($6)	($6)	($6)	($6)	($7)
Change in Deficiency	($0)	$0	$0	$0	$0	$0	($0)	($0)	$0	($0)	$0	($0)	($0)	($0)	$0	$0	$1	$0	$1	($0)	($3)
Change in System Fixed Cost	($523)	$0	$0	$0	($0)	($31)	($55)	($58)	($63)	($65)	($66)	($69)	($85)	($86)	($95)	($87)	($113)	($88)	($87)	($58)	($57)
Net (Benefit)/Cost	$32	$0	($0)	($0)	($0)	$13	$13	$15	$20	$10	$13	$11	$15	$14	($3)	$15	($12)	($18)	($27)	($50)	($35)

Low Natural Gas, High CO2 Price-Policy Scenario

(Benefit)/Cost	*PVRR(d)*	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Cost of Projects	$1,174	$0	$0	$0	$17	$103	$129	$133	$140	$144	$147	$151	$167	$171	$172	$181	$185	$186	$187	$190	$198
Change in NPC	($446)	$0	$0	$0	($17)	($57)	($58)	($58)	($54)	($61)	($60)	($58)	($44)	($39)	($51)	($62)	($83)	($23)	($43)	($85)	($102)
Change in Emissions	($195)	$0	$0	$0	$0	$0	$0	$0	$0	($8)	($18)	($31)	($42)	($49)	($50)	($61)	($71)	($31)	($44)	($38)	($71)
Change in VOM	($18)	$0	$0	$0	($0)	($1)	($1)	($1)	($2)	($1)	($1)	($1)	($2)	($2)	($4)	($3)	($4)	($2)	($3)	($12)	($6)
Change in DSM	($7)	$0	$0	$0	$0	($1)	($1)	($1)	($1)	($1)	($1)	($1)	($1)	($1)	($1)	($1)	($1)	($1)	($1)	($1)	($3)
Change in Deficiency	($3)	$0	$0	$0	$0	$0	($0)	($0)	$0	$0	$0	($0)	($0)	($0)	($0)	($2)	($1)	$0	($5)	$2	($2)
Change in System Fixed Cost	($638)	$0	$0	$0	($0)	($31)	($55)	($58)	($62)	($65)	($66)	($68)	($100)	($103)	($123)	($97)	($85)	($185)	($159)	($176)	($75)
Net (Benefit)/Cost	($133)	$0	$0	$0	($0)	$14	$13	$15	$21	$8	$1	($9)	($22)	($23)	($56)	($45)	($61)	($55)	($67)	($120)	($60)

OFPC Natural Gas, Zero CO2 Price-Policy Scenario

(Benefit)/Cost	*PVRR(d)*	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Cost of Projects	$1,174	$0	$0	$0	$17	$103	$129	$133	$140	$144	$147	$151	$167	$171	$172	$181	$185	$186	$187	$190	$198
Change in NPC	($519)	$0	$0	($0)	($17)	($60)	($63)	($66)	($69)	($75)	($70)	($72)	($66)	($82)	($56)	($72)	($98)	($73)	($77)	$27	($94)
Change in Emissions	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Change in VOM	($25)	$0	$0	($0)	($0)	($1)	($2)	($2)	($2)	($2)	($2)	($2)	($1)	($5)	($9)	($10)	($11)	($2)	($2)	($0)	($3)
Change in DSM	$17	$0	$0	$0	$1	$1	$1	$2	$2	$2	$2	$2	$2	$2	$3	$3	$3	$3	$3	$2	$4
Change in Deficiency	$0	$0	$0	($0)	($0)	$0	$0	($0)	$0	$0	$0	$0	($0)	$1	$1	$0	$0	($1)	($1)	($0)	$1
Change in System Fixed Cost	($704)	$0	$0	$0	($0)	($31)	($55)	($58)	($63)	($65)	($66)	($69)	($104)	($117)	($171)	($120)	($78)	($140)	($140)	($264)	($170)
Net (Benefit)/Cost	($57)	$0	$0	$0	$0	$12	$10	$9	$9	$4	$10	$10	($3)	($30)	($60)	($17)	$1	($26)	($30)	($46)	($64)

Medium Natural Gas, Medium CO2 Price-Policy Scenario

(Benefit)/Cost	*PVRR(d)*	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Cost of Projects	$1,174	$0	$0	$0	$17	$103	$129	$133	$140	$144	$147	$151	$167	$171	$172	$181	$185	$186	$187	$190	$198
Change in NPC	($625)	$0	($0)	($0)	($18)	($63)	($67)	($69)	($69)	($74)	($69)	($71)	($66)	($72)	($54)	($99)	($132)	($135)	($143)	($135)	($66)
Change in Emissions	($51)	$0	$0	$0	$0	$0	$0	$0	$0	($6)	($7)	($8)	($9)	($8)	($9)	($12)	($16)	($13)	($15)	($17)	($14)
Change in VOM	($27)	$0	$0	($0)	($0)	($1)	($2)	($2)	($2)	($2)	($2)	($2)	($1)	($2)	($10)	($10)	($11)	($3)	($4)	($4)	($3)
Change in DSM	$29	$0	$0	$0	$0	$0	$0	$2	$2	$2	$2	$3	$4	$5	$6	$7	$7	$7	$7	$7	$8
Change in Deficiency	$1	$0	$0	($0)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	($0)	($0)	($0)	$1	$0
Change in System Fixed Cost	($613)	$0	$0	$0	($0)	($31)	($56)	($58)	($63)	($65)	($67)	($69)	($105)	($108)	($175)	($117)	($52)	($89)	($88)	($97)	($182)
Net (Benefit)/Cost	($111)	$0	$0	$0	($1)	$8	$5	$6	$8	($2)	$4	$3	($11)	($14)	($69)	($51)	($18)	($47)	($56)	($53)	($59)

Medium Natural Gas, High CO2 Price-Policy Scenario

(Benefit)/Cost	*PVRR(d)*	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Cost of Projects	$1,174	$0	$0	$0	$17	$103	$129	$133	$140	$144	$147	$151	$167	$171	$172	$181	$185	$186	$187	$190	$198
Change in NPC	($495)	$0	$0	$0	($17)	($62)	($66)	($66)	($66)	($71)	($68)	($71)	($56)	($66)	($47)	($43)	($41)	($92)	($101)	($27)	($76)
Change in Emissions	($219)	$0	$0	$0	$0	$0	$0	$0	$0	($9)	($18)	($28)	($43)	($60)	($50)	($51)	($60)	($53)	($58)	($85)	($78)
Change in VOM	($21)	$0	$0	$0	($0)	($1)	($2)	($2)	($2)	($2)	($2)	($2)	($2)	($2)	($2)	($2)	($2)	($10)	($10)	($3)	($3)
Change in DSM	($43)	$0	$0	($1)	($1)	($2)	($2)	($3)	($3)	($4)	($4)	($4)	($5)	($6)	($6)	($7)	($8)	($9)	($11)	($14)	($17)
Change in Deficiency	($5)	$0	$0	($0)	$0	$0	$0	$0	($0)	$0	$0	$0	($0)	$0	$0	($1)	($1)	($3)	($3)	($8)	($2)
Change in System Fixed Cost	($615)	$0	$0	$0	($0)	($31)	($55)	($58)	($63)	($65)	($66)	($68)	($88)	($83)	($129)	($134)	($137)	($131)	($129)	($100)	($97)
Net (Benefit)/Cost	($224)	$0	$0	($0)	($1)	$7	$4	$4	$5	($7)	($11)	($22)	($26)	($44)	($62)	($58)	($63)	($111)	($125)	($47)	($74)

High Natural Gas, Zero CO2 Price-Policy Scenario

(Benefit)/Cost	*PVRR(d)*	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Cost of Projects	$1,174	$0	$0	$0	$17	$103	$129	$133	$140	$144	$147	$151	$167	$171	$172	$181	$185	$186	$187	$190	$198
Change in NPC	($724)	$0	$0	$0	($22)	($78)	($88)	($83)	($82)	($89)	($84)	($87)	($80)	$2	($112)	($93)	($115)	($172)	($175)	($120)	($147)
Change in Emissions	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Change in VOM	($21)	$0	$0	($0)	($0)	($1)	($2)	($2)	($2)	($2)	($2)	($2)	($2)	($0)	($2)	($2)	($2)	($8)	($8)	($7)	($7)
Change in DSM	$13	$0	($0)	($0)	($0)	$1	$1	$1	$1	$1	$1	$1	$1	$2	$2	$2	$3	$4	$6	$7	$7
Change in Deficiency	$1	$0	$0	$0	$0	$0	$1	($0)	$0	$1	$0	$0	$0	$0	$1	$1	($0)	($1)	$2	($3)	($3)
Change in System Fixed Cost	($703)	$0	$0	$0	($0)	($31)	($55)	($65)	($70)	($73)	($74)	($76)	($92)	($224)	($101)	($130)	($113)	($112)	($125)	($164)	($147)
Net (Benefit)/Cost	($260)	$0	($0)	($0)	($6)	($6)	($15)	($16)	($14)	($18)	($12)	($14)	($6)	($49)	($41)	($41)	($43)	($102)	($113)	($97)	($98)

High Natural Gas, Medium CO2 Price-Policy Scenario

(Benefit)/Cost	*PVRR(d)*	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Cost of Projects	$1,174	$0	$0	$0	$17	$103	$129	$133	$140	$144	$147	$151	$167	$171	$172	$181	$185	$186	$187	$190	$198
Change in NPC	($740)	$0	$0	$0	($21)	($76)	($85)	($83)	($82)	($88)	($83)	($85)	($79)	($92)	($121)	($75)	($145)	($117)	($131)	($134)	($149)
Change in Emissions	($44)	$0	$0	$0	$0	$0	$0	$0	$0	($6)	($7)	($8)	($7)	($8)	($8)	($6)	($12)	($11)	($12)	($14)	($16)
Change in VOM	($15)	$0	$0	$0	($0)	($1)	($2)	($2)	($2)	($2)	($2)	($2)	($2)	($2)	($2)	($2)	($2)	($2)	($2)	($2)	($3)
Change in DSM	($65)	$0	($0)	($1)	($3)	($4)	($4)	($4)	($6)	($6)	($7)	($8)	($9)	($9)	($11)	($12)	($14)	($14)	($14)	($14)	($14)
Change in Deficiency	$2	$0	$0	$0	$0	$0	$0	($0)	$0	$1	$0	$1	$1	$1	$1	$0	$1	($1)	($1)	($0)	($1)
Change in System Fixed Cost	($584)	$0	$0	$0	($0)	($31)	($55)	($58)	($63)	($65)	($66)	($68)	($85)	($83)	($86)	($142)	($54)	($135)	($125)	($122)	($124)
Net (Benefit)/Cost	($272)	$0	($0)	($1)	($7)	($9)	($17)	($14)	($13)	($23)	($18)	($20)	($15)	($22)	($55)	($56)	($42)	($94)	($99)	($96)	($109)

High Natural Gas, High CO2 Price-Policy Scenario

(Benefit)/Cost	*PVRR(d)*	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Cost of Projects	$1,174	$0	$0	$0	$17	$103	$129	$133	$140	$144	$147	$151	$167	$171	$172	$181	$185	$186	$187	$190	$198
Change in NPC	($585)	$0	$0	$0	($22)	($78)	($87)	($85)	($84)	($91)	($87)	($91)	$3	($84)	($81)	($50)	($78)	($68)	($63)	($55)	($103)
Change in Emissions	($151)	$0	$0	$0	$0	$0	$0	$0	$0	($8)	($16)	($25)	($10)	($46)	($43)	($43)	($48)	($35)	($33)	($35)	($54)
Change in VOM	($14)	$0	$0	$0	($0)	($1)	($2)	($2)	($2)	($2)	($2)	($2)	($1)	($2)	($2)	($2)	($2)	($2)	($1)	($1)	($5)
Change in DSM	($19)	$0	$0	($0)	($0)	($0)	($0)	($0)	($2)	($2)	($2)	($3)	($4)	($4)	($4)	($4)	($4)	($4)	($4)	($4)	($4)
Change in Deficiency	($1)	$0	$0	$0	$0	$0	$0	($0)	$0	$1	$0	$0	$0	$0	$0	($2)	($1)	($4)	($2)	($1)	$1
Change in System Fixed Cost	($813)	$0	$0	$0	($0)	($31)	($55)	($58)	($63)	($65)	($66)	($68)	($195)	($86)	($124)	($186)	($139)	($194)	($212)	($217)	($262)
Net (Benefit)/Cost	($409)	$0	$0	($0)	($6)	($7)	($16)	($12)	($11)	($24)	($27)	($38)	($38)	($50)	($81)	($106)	($88)	($119)	($130)	($123)	($229)

Rocky Mountain Power
Exhibit RMP___(RTL-4)
Docket No. 17-035-40
Witness: Rick T. Link

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

Exhibit Accompanying Direct Testimony of Rick T. Link

Estimated Annual Revenue Requirement Results ($ million)

June 2017

Estimated Annual Revenue Requirement Results ($ million)

Low Natural Gas, Zero CO2 Price-Policy Scenario

(Benefit)/Cost	PVRR(d)	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Project Net Costs																																			
Transmission Project Capital Recovery	$681	$0	$0	$0	$12	$90	$87	$84	$81	$78	$76	$73	$71	$69	$66	$64	$61	$59	$57	$54	$53	$52	$51	$50	$49	$48	$47	$46	$45	$44	$44	$43	$42	$41	$40
Incremental Transmission Revenue	($82)	$0	$0	$0	($1)	($11)	($10)	($10)	($10)	($9)	($9)	($9)	($9)	($8)	($8)	($8)	($7)	($7)	($7)	($7)	($6)	($6)	($6)	($6)	($6)	($6)	($6)	($6)	($5)	($5)	($5)	($5)	($5)	($5)	($5)
New Wind PPA	$318	$0	$0	$0	$0	$0	$24	$25	$26	$28	$29	$30	$44	$45	$44	$49	$50	$49	$47	$47	$52	$57	$58	$60	$61	$62	$0	$0	$0	$0	$0	$0	$0	$0	$0
New Wind Capital Recovery	$1,360	$0	$0	$0	$29	$179	$164	$152	$143	$135	$132	$130	$128	$127	$126	$125	$123	$122	$121	$120	$119	$118	$117	$116	$115	$115	$115	$115	$115	$116	$118	$121	$127	$142	$91
New Wind O&M	$263	$0	$0	$0	$3	$19	$20	$20	$22	$22	$23	$23	$24	$24	$25	$26	$26	$27	$28	$28	$29	$30	$30	$31	$32	$33	$34	$35	$35	$36	$37	$38	$39	$40	$34
New Wind PTCs	($795)	$0	$0	$0	($29)	($131)	($131)	($136)	($142)	($141)	($146)	($146)	($152)	($151)	($121)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Project Cost	$1,745	$0	$0	$0	$14	$146	$152	$134	$120	$114	$104	$101	$106	$106	$132	$256	$254	$250	$245	$243	$246	$250	$250	$251	$252	$253	$190	$190	$190	$191	$193	$197	$203	$218	$160
System Impacts																																			
NPC	($426)	$0	$0	$1	($15)	($54)	($55)	($54)	($50)	($53)	($50)	($51)	($44)	($44)	($22)	($18)	($19)	($38)	($36)	($32)	($31)	($36)	($37)	($38)	($39)	($38)	($30)	($31)	($31)	($32)	($33)	($32)	($34)	($35)	($27)
Emissions	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Other Variable Costs	($142)	$0	($0)	($1)	($3)	($5)	($8)	($9)	($11)	($11)	($12)	($12)	($14)	($12)	($21)	($23)	($22)	($13)	($16)	($14)	($15)	($19)	($19)	($20)	($20)	($20)	($16)	($16)	($16)	($17)	($17)	($17)	($18)	($18)	($14)
System Fixed Costs	($1,002)	$0	$0	$0	($0)	($31)	($56)	($58)	($63)	($65)	($66)	($69)	($85)	($87)	($130)	($114)	($147)	($157)	($165)	($141)	($151)	($143)	($146)	($151)	($153)	($151)	($120)	($122)	($124)	($128)	($131)	($127)	($137)	($139)	($107)
Net System Impacts	($1,571)	$0	($0)	($1)	($19)	($91)	($118)	($121)	($123)	($129)	($128)	($132)	($142)	($143)	($173)	($155)	($189)	($207)	($217)	($187)	($197)	($198)	($202)	($208)	($212)	($208)	($166)	($169)	($172)	($178)	($180)	($175)	($189)	($192)	($147)
Net (Benefit)/Cost	$174	$0	($0)	($1)	($4)	$55	$34	$13	($3)	($15)	($25)	($30)	($36)	($37)	($41)	$101	$65	$43	$28	$56	$49	$52	$48	$43	$39	$44	$24	$21	$18	$13	$13	$21	$14	$26	$12

Low Natural Gas, Medium CO2 Price-Policy Scenario

(Benefit)/Cost	PVRR(d)	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Project Net Costs																																			
Transmission Project Capital Recovery	$681	$0	$0	$0	$12	$90	$87	$84	$81	$78	$76	$73	$71	$69	$66	$64	$61	$59	$57	$54	$53	$52	$51	$50	$49	$48	$47	$46	$45	$44	$44	$43	$42	$41	$40
Incremental Transmission Revenue	($82)	$0	$0	$0	($1)	($11)	($10)	($10)	($10)	($9)	($9)	($9)	($9)	($8)	($8)	($8)	($7)	($7)	($7)	($7)	($6)	($6)	($6)	($6)	($6)	($6)	($6)	($6)	($5)	($5)	($5)	($5)	($5)	($5)	($5)
New Wind PPA	$318	$0	$0	$0	$0	$0	$24	$25	$26	$28	$29	$30	$44	$45	$44	$49	$50	$49	$47	$47	$52	$57	$58	$60	$61	$62	$0	$0	$0	$0	$0	$0	$0	$0	$0
New Wind Capital Recovery	$1,360	$0	$0	$0	$29	$179	$164	$152	$143	$135	$132	$130	$128	$127	$126	$125	$123	$122	$121	$120	$119	$118	$117	$116	$115	$115	$115	$115	$115	$116	$118	$121	$127	$142	$91
New Wind O&M	$263	$0	$0	$0	$3	$19	$20	$20	$22	$22	$23	$23	$24	$24	$25	$26	$26	$27	$28	$28	$29	$30	$30	$31	$32	$33	$34	$35	$35	$36	$37	$38	$39	$40	$34
New Wind PTCs	($795)	$0	$0	$0	($29)	($131)	($131)	($136)	($142)	($141)	($146)	($146)	($152)	($151)	($121)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Project Cost	$1,745	$0	$0	$0	$14	$146	$152	$134	$120	$114	$104	$101	$106	$106	$132	$256	$254	$250	$245	$243	$246	$250	$250	$251	$252	$253	$190	$190	$190	$191	$193	$197	$203	$218	$160
System Impacts																																			
NPC	($766)	$0	$0	$0	($17)	($57)	($58)	($57)	($53)	($60)	($57)	($58)	($51)	($54)	($66)	($64)	($67)	($103)	($112)	($156)	($144)	($96)	($98)	($101)	($103)	($101)	($81)	($82)	($84)	($86)	($88)	($85)	($92)	($94)	($72)
Emissions	($65)	$0	$0	$0	$0	$0	$0	$0	$0	($5)	($6)	($7)	($10)	($11)	($2)	($2)	($4)	($9)	($11)	($19)	($22)	($10)	($11)	($11)	($11)	($11)	($9)	($9)	($9)	($9)	($10)	($9)	($10)	($10)	($8)
Other Variable Costs	($67)	$0	($0)	($0)	($1)	($2)	($3)	($3)	($4)	($3)	($4)	($6)	($6)	($6)	($11)	($13)	($13)	($5)	($5)	($8)	($11)	($10)	($10)	($10)	($10)	($10)	($8)	($8)	($8)	($9)	($9)	($9)	($9)	($9)	($7)
System Fixed Costs	($754)	$0	$0	$0	($0)	($31)	($55)	($58)	($63)	($65)	($66)	($69)	($85)	($86)	($95)	($87)	($113)	($88)	($87)	($58)	($57)	($96)	($98)	($101)	($103)	($101)	($81)	($82)	($84)	($86)	($88)	($85)	($92)	($94)	($72)
Net System Impacts	($1,652)	$0	($0)	($0)	($18)	($90)	($116)	($119)	($119)	($134)	($134)	($139)	($152)	($157)	($175)	($166)	($196)	($205)	($214)	($241)	($233)	($213)	($217)	($224)	($228)	($224)	($178)	($181)	($185)	($191)	($194)	($188)	($203)	($207)	($158)
Net (Benefit)/Cost	$93	$0	($0)	($0)	($3)	$56	$36	$15	$1	($20)	($30)	($38)	($46)	($51)	($43)	$90	$58	$46	$31	$2	$13	$37	$33	$27	$24	$29	$12	$9	$5	$0	($1)	$8	($0)	$11	$1

Low Natural Gas, High CO2 Price-Policy Scenario

(Benefit)/Cost	PVRR(d)	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Project Net Costs																																			
Transmission Project Capital Recovery	$681	$0	$0	$0	$12	$90	$87	$84	$81	$78	$76	$73	$71	$69	$66	$64	$61	$59	$57	$54	$53	$52	$51	$50	$49	$48	$47	$46	$45	$44	$44	$43	$42	$41	$40
Incremental Transmission Revenue	($82)	$0	$0	$0	($1)	($11)	($10)	($10)	($10)	($9)	($9)	($9)	($9)	($8)	($8)	($8)	($7)	($7)	($7)	($7)	($6)	($6)	($6)	($6)	($6)	($6)	($6)	($6)	($5)	($5)	($5)	($5)	($5)	($5)	($5)
New Wind PPA	$318	$0	$0	$0	$0	$0	$24	$25	$26	$28	$29	$30	$44	$45	$44	$49	$50	$49	$47	$47	$52	$57	$58	$60	$61	$62	$0	$0	$0	$0	$0	$0	$0	$0	$0
New Wind Capital Recovery	$1,360	$0	$0	$0	$29	$179	$164	$152	$143	$135	$132	$130	$128	$127	$126	$125	$123	$122	$121	$120	$119	$118	$117	$116	$115	$115	$115	$115	$115	$116	$118	$121	$127	$142	$91
New Wind O&M	$263	$0	$0	$0	$3	$19	$20	$20	$22	$22	$23	$23	$24	$24	$25	$26	$26	$27	$28	$28	$29	$30	$30	$31	$32	$33	$34	$35	$35	$36	$37	$38	$39	$40	$34
New Wind PTCs	($795)	$0	$0	$0	($29)	($131)	($131)	($136)	($142)	($141)	($146)	($146)	($152)	($151)	($121)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Project Cost	$1,745	$0	$0	$0	$14	$146	$152	$134	$120	$114	$104	$101	$106	$106	$132	$256	$254	$250	$245	$243	$246	$250	$250	$251	$252	$253	$190	$190	$190	$191	$193	$197	$203	$218	$160
System Impacts																																			
NPC	($600)	$0	$0	$0	($17)	($57)	($58)	($58)	($54)	($61)	($60)	($58)	($44)	($39)	($51)	($62)	($83)	($23)	($43)	($85)	($102)	($64)	($66)	($68)	($69)	($68)	($54)	($55)	($56)	($58)	($59)	($57)	($61)	($63)	($48)
Emissions	($331)	$0	$0	$0	$0	$0	$0	$0	$0	($8)	($18)	($31)	($42)	($49)	($50)	($61)	($71)	($31)	($44)	($38)	($71)	($57)	($58)	($60)	($61)	($60)	($48)	($48)	($49)	($51)	($52)	($50)	($54)	($55)	($42)
Other Variable Costs	($43)	$0	$0	$0	($0)	($1)	($2)	($2)	($3)	($2)	($2)	($3)	($3)	($3)	($5)	($6)	($5)	($3)	($9)	($11)	($10)	($6)	($7)	($7)	($7)	($7)	($5)	($5)	($6)	($6)	($6)	($6)	($6)	($6)	($5)
System Fixed Costs	($964)	$0	$0	$0	($0)	($31)	($55)	($58)	($62)	($65)	($66)	($68)	($100)	($103)	($123)	($97)	($85)	($185)	($159)	($176)	($75)	($136)	($139)	($143)	($146)	($143)	($114)	($116)	($118)	($122)	($124)	($121)	($130)	($132)	($101)
Net System Impacts	($1,939)	$0	$0	$0	($17)	($89)	($116)	($118)	($119)	($136)	($146)	($160)	($189)	($194)	($229)	($225)	($245)	($242)	($253)	($310)	($258)	($264)	($270)	($278)	($283)	($278)	($221)	($225)	($229)	($237)	($241)	($234)	($252)	($256)	($196)
Net (Benefit)/Cost	($194)	$0	$0	$0	($3)	$57	$37	$16	$1	($22)	($42)	($59)	($82)	($88)	($97)	$30	$9	$8	($9)	($67)	($12)	($14)	($19)	($27)	($31)	($25)	($31)	($35)	($39)	($46)	($47)	($37)	($48)	($38)	($37)

OFPC Natural Gas, Zero CO2 Price-Policy Scenario

(Benefit)/Cost	PVRR(d)	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Project Net Costs																																			
Transmission Project Capital Recovery	$681	$0	$0	$0	$12	$90	$87	$84	$81	$78	$76	$73	$71	$69	$66	$64	$61	$59	$57	$54	$53	$52	$51	$50	$49	$48	$47	$46	$45	$44	$44	$43	$42	$41	$40
Incremental Transmission Revenue	($82)	$0	$0	$0	($1)	($11)	($10)	($10)	($10)	($9)	($9)	($9)	($9)	($8)	($8)	($8)	($7)	($7)	($7)	($7)	($6)	($6)	($6)	($6)	($6)	($6)	($6)	($6)	($5)	($5)	($5)	($5)	($5)	($5)	($5)
New Wind PPA	$318	$0	$0	$0	$0	$0	$24	$25	$26	$28	$29	$30	$44	$45	$44	$49	$50	$49	$47	$47	$52	$57	$58	$60	$61	$62	$0	$0	$0	$0	$0	$0	$0	$0	$0
New Wind Capital Recovery	$1,360	$0	$0	$0	$29	$179	$164	$152	$143	$135	$132	$130	$128	$127	$126	$125	$123	$122	$121	$120	$119	$118	$117	$116	$115	$115	$115	$115	$115	$116	$118	$121	$127	$142	$91
New Wind O&M	$263	$0	$0	$0	$3	$19	$20	$20	$22	$22	$23	$23	$24	$24	$25	$26	$26	$27	$28	$28	$29	$30	$30	$31	$32	$33	$34	$35	$35	$36	$37	$38	$39	$40	$34
New Wind PTCs	($795)	$0	$0	$0	($29)	($131)	($131)	($136)	($142)	($141)	($146)	($146)	($152)	($151)	($121)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Project Cost	$1,745	$0	$0	$0	$14	$146	$152	$134	$120	$114	$104	$101	$106	$106	$132	$256	$254	$250	$245	$243	$246	$250	$250	$251	$252	$253	$190	$190	$190	$191	$193	$197	$203	$218	$160
System Impacts																																			
NPC	($699)	$0	$0	($0)	($17)	($60)	($63)	($66)	($69)	($75)	($70)	($72)	($66)	($82)	($56)	($72)	($98)	($73)	($77)	$27	($94)	($75)	($77)	($79)	($81)	($79)	($63)	($64)	($65)	($67)	($69)	($67)	($72)	($73)	($56)
Emissions	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Other Variable Costs	($14)	$0	$0	$0	$1	($0)	($1)	($0)	$0	$0	($1)	($1)	$0	($2)	($6)	($6)	($7)	$0	($1)	$1	$1	($3)	($3)	($3)	($3)	($3)	($2)	($2)	($2)	($2)	($2)	($2)	($2)	($3)	($2)
System Fixed Costs	($1,085)	$0	$0	$0	($0)	($31)	($55)	($58)	($63)	($65)	($66)	($69)	($104)	($117)	($171)	($120)	($78)	($140)	($140)	($264)	($170)	($159)	($162)	($167)	($170)	($167)	($133)	($135)	($138)	($143)	($145)	($141)	($152)	($154)	($118)
Net System Impacts	($1,798)	$0	$0	$0	($17)	($91)	($119)	($124)	($131)	($140)	($137)	($141)	($170)	($201)	($232)	($198)	($183)	($213)	($217)	($236)	($262)	($237)	($242)	($249)	($254)	($249)	($198)	($202)	($206)	($213)	($216)	($210)	($226)	($230)	($176)
Net (Benefit)/Cost	($53)	$0	$0	$0	($3)	$55	$33	$10	($11)	($27)	($33)	($40)	($64)	($95)	($101)	$58	$71	$37	$28	$7	($16)	$13	$8	$2	($2)	$3	($8)	($12)	($16)	($21)	($23)	($13)	($23)	($12)	($17)

Medium Natural Gas, Medium CO2 Price-Policy Scenario

(Benefit)/Cost	PVRR(d)	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Project Net Costs																																			
Transmission Project Capital Recovery	$681	$0	$0	$0	$12	$90	$87	$84	$81	$78	$76	$73	$71	$69	$66	$64	$61	$59	$57	$54	$53	$52	$51	$50	$49	$48	$47	$46	$45	$44	$44	$43	$42	$41	$40
Incremental Transmission Revenue	($82)	$0	$0	$0	($1)	($11)	($10)	($10)	($10)	($9)	($9)	($9)	($9)	($8)	($8)	($8)	($7)	($7)	($7)	($7)	($6)	($6)	($6)	($6)	($6)	($6)	($6)	($6)	($5)	($5)	($5)	($5)	($5)	($5)	($5)
New Wind PPA	$318	$0	$0	$0	$0	$0	$24	$25	$26	$28	$29	$30	$44	$45	$44	$49	$50	$49	$47	$47	$52	$57	$58	$60	$61	$62	$0	$0	$0	$0	$0	$0	$0	$0	$0
New Wind Capital Recovery	$1,360	$0	$0	$0	$29	$179	$164	$152	$143	$135	$132	$130	$128	$127	$126	$125	$123	$122	$121	$120	$119	$118	$117	$116	$115	$115	$115	$115	$115	$116	$118	$121	$127	$142	$91
New Wind O&M	$263	$0	$0	$0	$3	$19	$20	$20	$22	$22	$23	$23	$24	$24	$25	$26	$26	$27	$28	$28	$29	$30	$30	$31	$32	$33	$34	$35	$35	$36	$37	$38	$39	$40	$34
New Wind PTCs	($795)	$0	$0	$0	($29)	($131)	($131)	($136)	($142)	($141)	($146)	($146)	($152)	($151)	($121)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Project Cost	$1,745	$0	$0	$0	$14	$146	$152	$134	$120	$114	$104	$101	$106	$106	$132	$256	$254	$250	$245	$243	$246	$250	$250	$251	$252	$253	$190	$190	$190	$191	$193	$197	$203	$218	$160
System Impacts																																			
NPC	($888)	$0	($0)	($0)	($18)	($63)	($67)	($69)	($69)	($74)	($69)	($71)	($66)	($72)	($54)	($99)	($132)	($135)	($143)	($135)	($66)	($110)	($112)	($116)	($118)	($116)	($92)	($94)	($96)	($99)	($100)	($97)	($105)	($107)	($82)
Emissions	($84)	$0	$0	$0	$0	$0	$0	$0	$0	($6)	($7)	($8)	($9)	($8)	($9)	($12)	($16)	($13)	($15)	($17)	($14)	($14)	($14)	($14)	($14)	($15)	($14)	($12)	($12)	($12)	($13)	($12)	($13)	($13)	($10)
Other Variable Costs	$6	$0	$0	$0	$0	($1)	($2)	($1)	$0	$0	$0	$1	$2	$3	($3)	($3)	($4)	$4	$4	$5	$4	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1
System Fixed Costs	($916)	$0	$0	$0	($0)	($31)	($56)	($58)	($63)	($65)	($67)	($69)	($105)	($108)	($175)	($117)	($52)	($89)	($88)	($97)	($182)	($127)	($129)	($133)	($136)	($133)	($106)	($108)	($110)	($114)	($116)	($112)	($121)	($123)	($94)
Net System Impacts	($1,882)	$0	$0	$0	($18)	($95)	($124)	($128)	($132)	($146)	($143)	($147)	($178)	($185)	($241)	($231)	($203)	($233)	($243)	($243)	($258)	($249)	($254)	($262)	($267)	($262)	($208)	($212)	($217)	($223)	($227)	($220)	($238)	($242)	($185)
Net (Benefit)/Cost	($137)	$0	$0	$0	($4)	$51	$28	$7	($11)	($32)	($39)	($46)	($72)	($79)	($109)	$24	$51	$17	$2	($0)	($11)	$1	($4)	($11)	($15)	($10)	($18)	($22)	($26)	($32)	($34)	($24)	($35)	($24)	($26)

Estimated Annual Revenue Requirement Results ($ million)

Medium Natural Gas, High CO2 Price-Policy Scenario

(Benefit)/Cost	PVRR(d)	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Project Net Costs																																			
Transmission Project Capital Recovery	$681	$0	$0	$0	$12	$90	$87	$84	$81	$78	$76	$73	$71	$69	$66	$64	$61	$59	$57	$54	$53	$52	$51	$50	$49	$48	$47	$46	$45	$44	$44	$43	$42	$41	$40
Incremental Transmission Revenue	($82)	$0	$0	$0	($1)	($11)	($10)	($10)	($10)	($9)	($9)	($9)	($9)	($8)	($8)	($8)	($7)	($7)	($7)	($7)	($6)	($6)	($6)	($6)	($6)	($6)	($6)	($6)	($5)	($5)	($5)	($5)	($5)	($5)	($5)
New Wind PPA	$318	$0	$0	$0	$0	$0	$24	$25	$26	$28	$29	$30	$44	$45	$44	$49	$50	$49	$47	$47	$52	$57	$58	$60	$61	$62	$0	$0	$0	$0	$0	$0	$0	$0	$0
New Wind Capital Recovery	$1,360	$0	$0	$0	$29	$179	$164	$152	$143	$135	$132	$130	$128	$127	$126	$125	$123	$122	$121	$120	$119	$118	$117	$116	$115	$115	$115	$115	$115	$116	$118	$121	$127	$142	$91
New Wind O&M	$263	$0	$0	$0	$3	$19	$20	$20	$22	$22	$23	$23	$24	$24	$25	$26	$26	$27	$28	$28	$29	$30	$30	$31	$32	$33	$34	$35	$35	$36	$37	$38	$39	$40	$34
New Wind PTCs	($795)	$0	$0	$0	($29)	($131)	($131)	($136)	($142)	($141)	($146)	($146)	($152)	($151)	($121)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Project Cost	$1,745	$0	$0	$0	$14	$146	$152	$134	$120	$114	$104	$101	$106	$106	$132	$256	$254	$250	$245	$243	$246	$250	$250	$251	$252	$253	$190	$190	$190	$191	$193	$197	$203	$218	$160
System Impacts																																			
NPC	($658)	$0	$0	$0	($17)	($62)	($66)	($66)	($66)	($71)	($68)	($71)	($56)	($66)	($47)	($43)	($41)	($92)	($101)	($27)	($76)	($68)	($69)	($71)	($73)	($71)	($57)	($58)	($59)	($61)	($62)	($60)	($65)	($66)	($50)
Emissions	($377)	$0	$0	$0	$0	$0	$0	$0	$0	($9)	($18)	($28)	($43)	($60)	($50)	($51)	($60)	($53)	($58)	($85)	($78)	($66)	($67)	($69)	($70)	($69)	($55)	($56)	($57)	($59)	($60)	($58)	($63)	($64)	($49)
Other Variable Costs	($107)	$0	$0	($1)	($1)	($3)	($4)	($5)	($6)	($6)	($6)	($6)	($7)	($7)	($8)	($10)	($11)	($22)	($24)	($25)	($22)	($16)	($16)	($17)	($17)	($17)	($13)	($14)	($14)	($14)	($15)	($14)	($15)	($15)	($12)
System Fixed Costs	($921)	$0	$0	$0	($0)	($31)	($55)	($58)	($63)	($65)	($66)	($68)	($88)	($83)	($129)	($134)	($137)	($131)	($125)	($100)	($97)	($128)	($131)	($134)	($137)	($135)	($107)	($109)	($111)	($115)	($117)	($113)	($122)	($124)	($95)
Net System Impacts	($2,062)	$0	$0	($0)	($19)	($86)	($125)	($130)	($134)	($151)	($158)	($173)	($193)	($216)	($235)	($238)	($240)	($298)	($312)	($237)	($273)	($277)	($283)	($292)	($297)	($292)	($232)	($236)	($241)	($249)	($253)	($246)	($265)	($269)	($206)
Net (Benefit)/Cost	($317)	$0	$0	($0)	($4)	$50	$27	$5	($14)	($38)	($55)	($72)	($87)	($110)	($103)	$17	$6	($48)	($67)	$6	($26)	($27)	($33)	($41)	($46)	($39)	($42)	($46)	($51)	($58)	($60)	($49)	($62)	($51)	($47)

High Natural Gas, Zero CO2 Price-Policy Scenario

(Benefit)/Cost	PVRR(d)	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Project Net Costs																																			
Transmission Project Capital Recovery	$681	$0	$0	$0	$12	$90	$87	$84	$81	$78	$76	$73	$71	$69	$66	$64	$61	$59	$57	$54	$53	$52	$51	$50	$49	$48	$47	$46	$45	$44	$44	$43	$42	$41	$40
Incremental Transmission Revenue	($82)	$0	$0	$0	($1)	($11)	($10)	($10)	($10)	($9)	($9)	($9)	($9)	($8)	($8)	($8)	($7)	($7)	($7)	($7)	($6)	($6)	($6)	($6)	($6)	($6)	($6)	($6)	($5)	($5)	($5)	($5)	($5)	($5)	($5)
New Wind PPA	$318	$0	$0	$0	$0	$0	$24	$25	$26	$28	$29	$30	$44	$45	$44	$49	$50	$49	$47	$47	$52	$57	$58	$60	$61	$62	$0	$0	$0	$0	$0	$0	$0	$0	$0
New Wind Capital Recovery	$1,360	$0	$0	$0	$29	$179	$164	$152	$143	$135	$132	$130	$128	$127	$126	$125	$123	$122	$121	$120	$119	$118	$117	$116	$115	$115	$115	$115	$115	$116	$118	$121	$127	$142	$91
New Wind O&M	$263	$0	$0	$0	$3	$19	$20	$20	$22	$22	$23	$23	$24	$24	$25	$26	$26	$27	$28	$28	$29	$30	$30	$31	$32	$33	$34	$35	$35	$36	$37	$38	$39	$40	$34
New Wind PTCs	($795)	$0	$0	$0	($29)	($131)	($131)	($136)	($142)	($141)	($146)	($146)	($152)	($151)	($121)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Project Cost	$1,745	$0	$0	$0	$14	$146	$152	$134	$120	$114	$104	$101	$106	$106	$132	$256	$254	$250	$245	$243	$246	$250	$250	$251	$252	$253	$190	$190	$190	$191	$193	$197	$203	$218	$160
System Impacts																																			
NPC	($1,010)	$0	$0	$0	($22)	($78)	($88)	($83)	($82)	($89)	($84)	($87)	($80)	$2	($112)	($93)	($115)	($172)	($175)	($120)	($147)	($120)	($122)	($126)	($128)	($126)	($100)	($102)	($104)	($107)	($109)	($106)	($114)	($116)	($89)
Emissions	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Other Variable Costs	($8)	$0	($0)	($0)	($1)	($0)	($1)	($2)	($1)	($0)	($1)	($1)	($1)	$2	$0	$1	$0	($4)	($0)	($3)	($3)	($1)	($1)	($1)	($1)	($1)	($1)	($1)	($1)	($1)	($1)	($1)	($1)	($1)	($1)
System Fixed Costs	($1,067)	$0	$0	$0	($0)	($31)	($55)	($65)	($70)	($73)	($74)	($76)	($92)	($224)	($101)	($130)	($113)	($112)	($125)	($164)	($147)	($152)	($155)	($160)	($163)	($160)	($127)	($129)	($132)	($136)	($139)	($135)	($145)	($148)	($113)
Net System Impacts	($2,086)	$0	($0)	($0)	($23)	($109)	($144)	($149)	($153)	($161)	($159)	($165)	($173)	($220)	($213)	($222)	($227)	($288)	($300)	($287)	($296)	($272)	($278)	($286)	($292)	($287)	($228)	($232)	($237)	($244)	($248)	($241)	($260)	($264)	($203)
Net (Benefit)/Cost	($341)	$0	($0)	($0)	($9)	$37	$8	($15)	($33)	($48)	($55)	($63)	($66)	($115)	($82)	$34	$27	($38)	($55)	($44)	($50)	($22)	($28)	($36)	($40)	($34)	($38)	($42)	($47)	($53)	($55)	($44)	($57)	($46)	($43)

High Natural Gas, Medium CO2 Price-Policy Scenario

(Benefit)/Cost	PVRR(d)	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Project Net Costs																																			
Transmission Project Capital Recovery	$681	$0	$0	$0	$12	$90	$87	$84	$81	$78	$76	$73	$71	$69	$66	$64	$61	$59	$57	$54	$53	$52	$51	$50	$49	$48	$47	$46	$45	$44	$44	$43	$42	$41	$40
Incremental Transmission Revenue	($82)	$0	$0	$0	($1)	($11)	($10)	($10)	($10)	($9)	($9)	($9)	($9)	($8)	($8)	($8)	($7)	($7)	($7)	($7)	($6)	($6)	($6)	($6)	($6)	($6)	($6)	($6)	($5)	($5)	($5)	($5)	($5)	($5)	($5)
New Wind PPA	$318	$0	$0	$0	$0	$0	$24	$25	$26	$28	$29	$30	$44	$45	$44	$49	$50	$49	$47	$47	$52	$57	$58	$60	$61	$62	$0	$0	$0	$0	$0	$0	$0	$0	$0
New Wind Capital Recovery	$1,360	$0	$0	$0	$29	$179	$164	$152	$143	$135	$132	$130	$128	$127	$126	$125	$123	$122	$121	$120	$119	$118	$117	$116	$115	$115	$115	$115	$115	$116	$118	$121	$127	$142	$91
New Wind O&M	$263	$0	$0	$0	$3	$19	$20	$20	$22	$22	$23	$23	$24	$24	$25	$26	$26	$27	$28	$28	$29	$30	$30	$31	$32	$33	$34	$35	$35	$36	$37	$38	$39	$40	$34
New Wind PTCs	($795)	$0	$0	$0	($29)	($131)	($131)	($136)	($142)	($141)	($146)	($146)	($152)	($151)	($121)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Project Cost	$1,745	$0	$0	$0	$14	$146	$152	$134	$120	$114	$104	$101	$106	$106	$132	$256	$254	$250	$245	$243	$246	$250	$250	$251	$252	$253	$190	$190	$190	$191	$193	$197	$203	$218	$160
System Impacts																																			
NPC	($1,045)	$0	$0	$0	($21)	($76)	($85)	($83)	($82)	($88)	($83)	($85)	($79)	($92)	($121)	($75)	($145)	($117)	($131)	($134)	($149)	($127)	($130)	($134)	($137)	($134)	($107)	($109)	($111)	($114)	($116)	($113)	($122)	($124)	($95)
Emissions	($71)	$0	$0	$0	$0	$0	$0	$0	$0	($6)	($7)	($8)	($7)	($8)	($8)	($6)	($12)	($11)	($12)	($14)	($16)	($11)	($12)	($12)	($12)	($12)	($9)	($10)	($10)	($10)	($10)	($10)	($11)	($11)	($8)
Other Variable Costs	($116)	$0	($0)	($1)	($3)	($5)	($6)	($6)	($8)	($8)	($9)	($9)	($10)	($10)	($12)	($13)	($15)	($17)	($17)	($16)	($18)	($16)	($16)	($16)	($17)	($16)	($13)	($13)	($14)	($14)	($14)	($14)	($15)	($15)	($12)
System Fixed Costs	($864)	$0	$0	$0	($0)	($31)	($55)	($58)	($63)	($65)	($66)	($68)	($85)	($83)	($86)	($142)	($54)	($135)	($125)	($122)	($124)	($117)	($120)	($123)	($126)	($124)	($98)	($100)	($102)	($105)	($107)	($104)	($112)	($114)	($87)
Net System Impacts	($2,096)	$0	($0)	($1)	($24)	($112)	($147)	($147)	($152)	($167)	($165)	($171)	($182)	($193)	($227)	($237)	($227)	($280)	($286)	($286)	($307)	($272)	($278)	($286)	($291)	($286)	($227)	($231)	($236)	($244)	($248)	($241)	($259)	($264)	($202)
Net (Benefit)/Cost	($351)	$0	($0)	($1)	($10)	$34	$6	($13)	($32)	($53)	($61)	($69)	($75)	($87)	($95)	$19	$27	($30)	($41)	($43)	($61)	($22)	($27)	($35)	($40)	($33)	($37)	($41)	($46)	($53)	($54)	($44)	($56)	($46)	($43)

High Natural Gas, High CO2 Price-Policy Scenario

(Benefit)/Cost	PVRR(d)	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Project Net Costs																																			
Transmission Project Capital Recovery	$681	$0	$0	$0	$12	$90	$87	$84	$81	$78	$76	$73	$71	$69	$66	$64	$61	$59	$57	$54	$53	$52	$51	$50	$49	$48	$47	$46	$45	$44	$44	$43	$42	$41	$40
Incremental Transmission Revenue	($82)	$0	$0	$0	($1)	($11)	($10)	($10)	($10)	($9)	($9)	($9)	($9)	($8)	($8)	($8)	($7)	($7)	($7)	($7)	($6)	($6)	($6)	($6)	($6)	($6)	($6)	($6)	($5)	($5)	($5)	($5)	($5)	($5)	($5)
New Wind PPA	$318	$0	$0	$0	$0	$0	$24	$25	$26	$28	$29	$30	$44	$45	$44	$49	$50	$49	$47	$47	$52	$57	$58	$60	$61	$62	$0	$0	$0	$0	$0	$0	$0	$0	$0
New Wind Capital Recovery	$1,360	$0	$0	$0	$29	$179	$164	$152	$143	$135	$132	$130	$128	$127	$126	$125	$123	$122	$121	$120	$119	$118	$117	$116	$115	$115	$115	$115	$115	$116	$118	$121	$127	$142	$91
New Wind O&M	$263	$0	$0	$0	$3	$19	$20	$20	$22	$22	$23	$23	$24	$24	$25	$26	$26	$27	$28	$28	$29	$30	$30	$31	$32	$33	$34	$35	$35	$36	$37	$38	$39	$40	$34
New Wind PTCs	($795)	$0	$0	$0	($29)	($131)	($131)	($136)	($142)	($141)	($146)	($146)	($152)	($151)	($121)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Net Project Cost	$1,745	$0	$0	$0	$14	$146	$152	$134	$120	$114	$104	$101	$106	$106	$132	$256	$254	$250	$245	$243	$246	$250	$250	$251	$252	$253	$190	$190	$190	$191	$193	$197	$203	$218	$160
System Impacts																																			
NPC	($753)	$0	$0	$0	($22)	($78)	($87)	($85)	($84)	($91)	($87)	($91)	$3	($84)	($81)	($50)	($78)	($68)	($63)	($55)	($103)	($70)	($72)	($74)	($75)	($74)	($59)	($60)	($61)	($63)	($64)	($62)	($67)	($68)	($52)
Emissions	($253)	$0	$0	$0	$0	$0	$0	$0	$0	($8)	($16)	($25)	($10)	($46)	($43)	($43)	($48)	($35)	($33)	($35)	($54)	($43)	($44)	($45)	($46)	($45)	($36)	($37)	($37)	($39)	($39)	($38)	($41)	($42)	($32)
Other Variable Costs	($52)	$0	($0)	($1)	($1)	($2)	($3)	($4)	($3)	($3)	($4)	($5)	($4)	($6)	($6)	($7)	($7)	($10)	($8)	($6)	($8)	($7)	($8)	($8)	($8)	($8)	($6)	($6)	($6)	($7)	($7)	($7)	($7)	($7)	($6)
System Fixed Costs	($1,282)	$0	$0	$0	($0)	($31)	($55)	($58)	($63)	($65)	($66)	($68)	($195)	($86)	($124)	($186)	($139)	($194)	($212)	($217)	($262)	($196)	($200)	($206)	($210)	($206)	($164)	($167)	($170)	($176)	($178)	($173)	($187)	($190)	($146)
Net System Impacts	($2,340)	$0	($0)	($2)	($3)	($110)	($145)	($145)	($150)	($168)	($174)	($189)	($205)	($222)	($254)	($286)	($273)	($306)	($316)	($313)	($427)	($316)	($323)	($333)	($333)	($339)	($333)	($264)	($269)	($275)	($284)	($288)	($280)	($302)	($307)	($235)
Net (Benefit)/Cost	($595)	$0	$0	($0)	($9)	$36	$8	($11)	($30)	($54)	($70)	($87)	($99)	($116)	($122)	($31)	($19)	($56)	($71)	($70)	($181)	($66)	($73)	($82)	($87)	($80)	($75)	($79)	($85)	($93)	($95)	($83)	($99)	($89)	($76)

Rocky Mountain Power
Docket No. 17-035-40
Witness: Jeffrey K. Larsen

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

Direct Testimony of Jeffrey K. Larsen

June 2017

INTRODUCTION AND SUMMARY

Q. Please state your name, business address, and current position with PacifiCorp d/b/a Rocky Mountain Power ("Company").

A. My name is Jeffrey K. Larsen, and my business address is 1407 West North Temple, Suite 310, Salt Lake City, Utah 84116. I am currently employed as Vice President of Regulation for Rocky Mountain Power.

Q. Please describe your education and professional background.

A. I received a Master of Business Administration degree from Utah State University in 1994, and a Bachelor of Science degree in Accounting from Brigham Young University in 1985. I have also participated in the Company's Business Leadership Program through the Wharton School, and an Advanced Education Program through the J.L. Kellogg School of Management at Northwestern University. In addition to formal education, I have also attended various educational, professional and electric-industry-related seminars and training programs during my career at the Company. I joined the Company in 1985, and I have held various accounting, compliance, regulatory, and management positions before my current position.

Q. Have you provided testimony in previous regulatory proceedings?

A. Yes. I have filed testimony on various matters in the states of Utah, Idaho, Wyoming, California, Washington, Oregon, and Nevada.

Q. What is the purpose of your testimony?

A. I explain the Company's requested ratemaking treatment for 860 MW of new wind facilities in eastern Wyoming ("Wind Projects") and for the 140-mile, 500 kilovolt ("kV") Aeolus-to-Bridger/Anticline transmission line and accompanying transmission

facilities (collectively, "Transmission Projects") for which the Company is seeking approval in this Application. Specifically, I describe how the Company proposes to match the costs and benefits of the Wind Projects and Transmission Projects ("Combined Projects") by deferring the costs and benefits that do not go through the Energy Balancing Account ("EBA") and passing back the net benefits through the proposed Resource Tracking Mechanism ("RTM").

Q. Please summarize the Company's proposed ratemaking treatment for the Combined Projects.

A. The Company requests approval of its decision to act on an opportunity to implement cost-effective generation and transmission facilities while minimizing the impact on customer rates. The Combined Projects are time-limited opportunities and inextricably linked—the Transmission Projects relieve existing congestion in eastern Wyoming, and the Wind Projects will rely on the new Transmission Projects for interconnection and allow the Company to realize the benefits of production tax credits ("PTCs") and zero-fuel-cost energy.

The proposed RTM is designed to capture customer benefits resulting from the Combined Projects, and match those benefits with the costs of the Projects until the costs and benefits are fully included in base rates through a general rate case. Once the full costs and benefits are included in base rates, recovery of those elements would cease through the RTM, with the exception of PTCs. After the next general rate case, the Company proposes to use the RTM to track the actual change in PTCs from the base level included in rates. Because PTCs are entirely dependent on the variable output of the Wind Projects and difficult to precisely forecast, tracking PTCs through the RTM

ensures that customers receive their full value and shareholders are treated fairly.

Under the RTM, the Company would begin deferring the costs and benefits associated with each new facility in the month it goes into service.

Q. As the Combined Projects come into service, what are the annual, estimated deferral balances that would flow through the RTM?

A. As described more fully later in my testimony and exhibits, the Company is projecting the initial annual revenue requirement impact for the years 2020 to 2023 to be in the range of ($6.8) million to $38.0 million in Utah, as shown in Table 1 of Exhibit RMP___(JKL-2). The Company will capture the impacts of the Combined Projects through the RTM until they are included in base rates.

Q. What are the differences between your calculation of revenue requirement impacts in Table 1 and Company witness Mr. Rick T. Link's analysis of revenue requirement savings from the Combined Projects?

A. Mr. Link conducted a revenue requirement differential analysis, and my analysis is a revenue requirement calculation based on his information. As such, my analysis shows the annual, near-term revenue requirement impacts of the large capital investments, while Mr. Link's economic analysis estimates the *change* in nominal revenue requirement, accounting for system costs that would have otherwise been incurred if the Combined Projects were not pursued. Mr. Link also calculates the present-value change in nominal revenue requirement due to the Combined Projects, which shows net customer benefits over time. In other words, Mr. Link's testimony demonstrates that over time customer rates will be lower with the Combined Projects than without.

Q. What is the potential rate impact to customers of the Combined Projects?

A. In the first full year of operation (2021), the rate impact to customers is less than 1.9 percent. While this percentage change reflects the year-one impact to customers, it does not fully reflect the value of the Combined Projects due to costs avoided over time. Table 3 of Mr. Link's testimony shows the present value savings calculated through 2050 to be $137 million. This demonstrates that although there is an initial increase in cost, the lifetime savings of the Combined Projects are significant.

Q. Is the RTM proposed here the same mechanism the Company proposes in the concurrently filed application for an order approving ratemaking treatment for the wind repowering project?

A. Yes. The Company proposes to use an RTM to track the costs and benefits associated with both the Combined Projects and the wind repowering project addressed in the Company's concurrent filing. The Company proposes to separately track the costs and benefits of the two projects through different sections of the new tariff, in this case Schedule 97B, which I provide in Exhibit RMP___(JKL-5). The Company proposes slight differences in the treatment of the deferral balances, applying the surcharge cap to the wind repowering project only.

REQUEST FOR APPROVAL OF RATEMAKING TREATMENT

Q. Under what authority is the Company proposing approval of the ratemaking treatment for the Combined Projects?

A. The Company seeks approval to defer the cost and benefits of the Combined Projects under Utah Code Ann. § 54-4-23, with the net deferral to be passed through the proposed RTM. Utah Code Ann. § 54-17-402 authorizes the Commission to approve a

utility's proposed "resource decisions" outside of a general rate case. Utah Code Ann. § 54-17-403 authorizes cost recovery of the approved resource decision "in a general rate case or other appropriate proceeding." The Company proposes to use the annual RTM review, filed concurrently with the annual EBA review, as the proceeding referenced in Utah Code Ann. § 54-17-403 for cost recovery. This will address the proper ratemaking treatment to match the annual costs and benefits of the Combined Projects until the costs and benefits are fully reflected in base rates, primarily including capital and operating costs, net power costs ("NPC") and PTC benefits. NPC savings would be captured in the Company's EBA under its current structure, however, as I describe later in my testimony, to the extent the EBA is modified or eliminated the Company would use the RTM to pass back any net power cost savings not captured in the EBA. Once the full costs are reflected in base rates in a general rate case, the Company proposes that the RTM continue to track only year-to-year changes in PTCs to capture the full impact of the new PTCs.

Q. Why is it appropriate to provide the Commission and interested parties the opportunity to review and approve the ratemaking treatment for a resource decision prior to construction?

A. The benefit of the RTM being approved now is that it sets the process for consistent and fair treatment between customers and shareholders with respect to the rate-making impacts of the Combined Projects. As a general policy matter, the Company believes that it is prudent and in the public interest to have regulatory review of large investments prior to implementation and construction. Such review avoids the need to address large investments in the context of a rate case along with the potential for

disallowances of very large investments. For instance, in Docket No. 14-035-147, the Commission and interested parties reviewed and approved a stipulation for closure of the Deer Creek Mine, that was initially filed under the provisions of Utah Code Ann. § 54-17-402, in conjunction with the ratemaking treatment.

As the other Company witnesses have discussed, the Combined Projects have positive economic benefits for customers and are in the public interest due to the benefits of the zero-fuel-cost energy and PTCs. Absent the proposed ratemaking treatment through the RTM, customers may not obtain the full benefits of the project, or a mismatch would occur between costs and benefits with customers receiving the immediate benefit of the zero-fuel-cost energy production and additional wheeling revenue through the EBA with no recognition of the capital and operations costs, which would be borne by the shareholders. Customers would be receiving benefits while shareholders would absorb a net cost. Moreover, the Company is proposing to implement the RTM concurrently with the EBA in order to match the timing for all costs and benefits in rates until they can be reflected in base rates through a general rate case.

RESOURCE TRACKING MECHANISM

Q. Please describe the mechanics of the RTM.

A. Upon the completion of each wind or transmission facility under construction, the Company will begin monthly deferrals of the associated costs and benefits in the RTM balancing account, which will operate on a calendar-year basis. On March 15 each year, the Company will file the RTM deferral balance from the prior calendar year, to be included in rates beginning May 1, on an interim basis. This schedule is aligned with

the EBA, and the RTM review will continue on the same schedule as the EBA each year.

Q. Why is it important to link the timing of the RTM with the EBA?

A. Linking the RTM and the EBA helps match the production benefits of the Wind Projects and wheeling revenues associated with the Transmission Projects, which will flow through the EBA, with the costs of the Combined Projects. Also, by filing the EBA and RTM concurrently, the Company can more readily combine the two mechanisms into a single line item on customer bills.

Q. What costs and revenues will be incorporated in the RTM deferral?

A. The deferral for the Combined Projects will include the following revenue requirement components:

- Plant revenue requirement, consisting of:
  - Capital investment
  - Accumulation Depreciation Reserve ("ADR")
  - Accumulated Deferred Income Tax ("ADIT")
  - Operations and Maintenance Expense ("O&M")
  - Depreciation expense
  - Property taxes
  - Wyoming Wind Tax
- NPC savings
- Wheeling revenues
- PTCs.

These items are summarized in Exhibit RMP___(JKL-1). The Company will calculate

the RTM deferral as the difference between the value included in base rates for these items and the new value taking into account the costs and benefits of the Combined Projects as they are placed into service.

REVENUE REQUIREMENT COMPONENTS OF RTM

Q. Please describe how the RTM will track rate base components, which include the capital investment, ADR, and ADIT.

A. After each wind and transmission facility under construction is placed into service, the Company will defer the full amount of the capital investment, ADR, and ADIT related to that facility in the RTM. Once the Company has included some or all of the Combined Projects in base rates through a future general rate case, the amount in rates will become the base plant balances that will be subtracted from the capital investment in subsequent annual RTM filings. The Company will use the net plant balance described above to calculate a return on investment using the most recent Commission-approved cost of capital and income tax rate.

Q. Please describe how the RTM will track depreciation expense.

A. The Company will include depreciation expense in the RTM deferral as the actual monthly plant-in-service balances associated with the Combined Projects, less the wind and transmission base plant-in-service balance, multiplied by the current depreciation rates. Until a general rate case is filed, no depreciation expense associated with the Combined Projects is reflected in base rates, so the full amount would be included in the RTM.

Q. How will the depreciation expense be calculated?

A. The current depreciation rates will be applied to the gross electric plant-in-service

("EPIS") balance, associated with the Combined Projects, to calculate the depreciation expense.

Q. How will the RTM reflect revenues from third-party transmission customers?

A. Since the Transmission Projects will be included in the Company's Open Access Transmission Tariff ("OATT"), part of the costs will be recovered from third-party transmission customers, which is treated as a revenue credit to retail customers. Exhibit RMP___(JKL-2) and Exhibit RMP___(JKL-3) assume that 12 percent of the transmission revenue requirement will be paid by third-party transmission customers and is included as an offset in the RTM. This percentage will be updated using the most current information at the time of each RTM filing. In Utah, wheeling revenues are trued-up through the EBA, so the impact would be zero in the RTM under the current structure of the EBA.

Q. How will the RTM reflect incremental O&M expense?

A. As facilities that are part of the Combined Projects are placed into service, the Company will include the actual O&M expense associated with the facilities in the RTM deferral.

Q. How will the RTM reflect property taxes?

A. The Company will calculate property taxes associated with the Combined Projects by taking the monthly average of the capital investment less ADR included in the RTM deferral, multiplied by the average property tax rate from the Company's last general rate case.

Q. How will the RTM reflect Wyoming wind taxes?

A. The Company will calculate the Wyoming wind tax be taking generation associated with the Wind Projects that are subject to the Wyoming wind tax multiplied by the

Wyoming wind tax rate.

NET POWER COST AND PTC BENEFITS IN THE RTM

Q. Please explain the calculation of the NPC benefits in the RTM.

A. The Combined Projects will add significant zero-fuel-cost energy to the system, reducing total NPC. Under the current EBA, 100 percent of the NPC benefits of the Wind Projects will be credited to customers, with zero percent assigned to the Company. Based on the Commission order in Docket No. 09-035-15, the current EBA pilot structure extends through December 31, 2019. If at the conclusion of the EBA pilot period, the EBA structure is modified such that less than 100 percent of the incremental NPC benefits is credited to customers through the EBA, the Company proposes to capture any of the incremental NPC benefits in the RTM that are not credited to customers through the EBA, allowing customers to continue to receive 100 percent of the net benefits of the Wind Projects until the costs and benefits of the Wind Projects are fully reflected in rates.

If it is necessary in that situation, the Company will calculate the NPC benefit in the RTM based on the increased generation achieved from the Wind Project. The Company will value the incremental energy using a monthly market price less wind integration costs. The calculation is described in Exhibit RMP__(JKL-4).

Q. What market price would the Company use to value the energy?

A. The monthly Four Corners heavy load hour ("HLH") and light load hour ("LLH") market price would be used, depending on the time of generation. Additionally, the market price would be reduced by the wind integration costs from the most recent integration study, which currently is from the Company's 2017 Integrated Resource

Plan.

Q. How will incremental wheeling revenues associated with the Transmission Projects be treated?

A. Wheeling revenues are included in the EBA and the true-up of wheeling revenues will generally occur through that mechanism. If there are any incremental third-party wheeling revenue benefits from the Transmission Projects not included in base rates or the EBA in the future, they will be added to the RTM.

Q. Please explain the calculation of the PTCs that will be included in the RTM.

A. Currently, the Internal Revenue Service ("IRS") rate for PTCs is $24 per megawatt-hour and PTCs are generally applicable for a period of 10 years after a wind resource is operational. The PTC rate is applied to the actual megawatt-hours of generation from the eligible wind turbine resources. This produces a tax credit that can be used to offset a company's income tax expense under IRS guidelines. To derive the revenue requirement value of the tax credit, the PTC value must be grossed-up by the Company's tax gross-up rate. The Company will use the tax gross-up rate from its most recent general rate case to calculate the value of the PTCs from the Wind Projects. The RTM will reflect the value for the grossed-up PTCs.

Q. Why should the RTM track the benefits of the PTCs on an ongoing basis?

A. The amount of PTCs received is entirely dependent on the amount of the generation at eligible facilities. The generation is highly dependent on weather, varying from year-to-year as weather patterns fluctuate. Accordingly, because the PTCs are significant and actual output is beyond the control of the Company, the Company proposes to use the RTM to track and true-up PTCs on an ongoing basis.

RTM CALCULATION AND STRUCTURE

Q. Have you prepared an exhibit that illustrates the calculation and structure of the RTM on a year-by-year basis?

A. Yes. Page 2 of Exhibit RMP___(JKL-2) provides an illustrative example of the calculation of the RTM on an annual basis. The annual amounts will be the sum of the monthly amounts shown in Exhibit RMP___(JKL-3), and the individual lines are described as part of that exhibit.

Q. Please explain Exhibit RMP__(JKL-3).

A. Exhibit RMP___(JKL-3) is an example of the RTM's monthly calculation. The RTM deferral will be adjusted after a general rate case to exclude amounts that are recovered as part of base rates in the rate case to assure against double-recovery. For items partially recovered in base rates, such as capital investments included for part of the test period, the portion included in the test period will be removed as of the effective date of the general rate case. Page 5 of Exhibit RMP___(JKL-3) includes an overview of the total plant revenue requirement, net power cost, PTC, and deferral balances.

Once per year on a calendar-year basis, the Company will sum the monthly RTM revenue requirement entries to prepare the annual RTM application for filing with the Commission on March 15, with an interim rate effective date that corresponds with the EBA interim rate effective date of May 1.

Q. How will the costs and benefits associated with the Combined Projects be allocated to Utah customers?

A. The Company will use Utah's applicable inter-jurisdictional allocation factors to allocate total-company revenue requirements to Utah based on the current

Commission-approved allocation methodology. Because the allocation factors are dynamic and change with variations in jurisdictional loads, the Company is proposing that the allocation factors used in the RTM match the allocation factors used in the calculation of the EBA.

Q. How will the Company calculate rates to credit or recover RTM balances?

A. The Company will file a separate rate to credit or recover the net amount in the RTM deferral. The Company is proposing that the allocation factors used in the RTM match the allocation factors used in the calculation of the EBA. Also, the Company proposes to use the same class allocation and rate design as used for the annual EBA filing. For billing purposes, the EBA and RTM rates could be consolidated on the customer bill.

Q. Has the Company prepared a tariff for the RTM?

A. Yes. The Company has prepared a tariff for implementation of the RTM. The tariff is identified as Schedule 97B, and is included in my testimony as Exhibit RMP__(JKL-5).

Q. What procedures do you envision for an application to adjust the RTM?

A. The Company expects that the Commission will docket and notice an RTM application similar to other tariff filings. The Commission staff and intervening parties will have an opportunity to examine the application and submit data requests. The Company will work with the parties, which could result in a consensus recommendation that will be presented to the Commission, or the matter could be scheduled for hearing if there are contested issues. The important aspect of the proposed RTM schedule is that it be processed concurrently with the EBA to preserve the matching principle for costs and benefits.

Q. Would stakeholders be able to challenge the general prudence of the Combined Projects when the Company files to change rates under the RTM?

A. No. The Company is seeking approval in this filing that the decision to develop the Combined Projects in tandem is reasonable, prudent, and in the public interest. If the Commission makes this finding in this proceeding, review of the specific costs included in the RTM would be subject to Utah Code Ann. § 54-17-403, which provides that retail rates may include the state's share of the costs of the approved resource decision up to the projected costs in this Application. Any increase from the projected costs would be subject to review by the Commission under Utah Code Ann. § 54-7-12. The Commission may only disallow some or all costs if the Commission finds the Company's actions in implementing the approved resource decision were not prudent because of new information or changed circumstances, or if the Company was responsible for material misrepresentation or concealment in connection with the resource approval process.

INTER-JURISDICTIONAL COST ALLOCATION

Q. How will the Company allocate the investment in the Combined Projects to the state jurisdictions PacifiCorp serves?

A. Currently, the Company's investments in wind generation and transmissions facilities are treated as system resources under the approved 2017 Protocol Allocation Agreement. That approved methodology will continue for ratemaking purposes through 2019. The same treatment will apply to new investments that occur in that period. After that time period, the then-applicable allocation methodology approved by the Commission would govern.

The Company's analysis demonstrates that the Combined Projects deliver net system benefits, and the Company believes that the Combined Projects should continue to be allocated across the six-state service territory on a system basis unless there is an agreement through the Multi-State Process to do otherwise.

CONCLUSION

Q. Please summarize your testimony.

A. To match the investments and operational costs with the benefits of the Combined Projects until the costs and benefits are fully included in base rates through a general rate case, the Company proposes to defer all costs and benefits and to implement the RTM. Matching the costs and benefits through the RTM is fair to customers and shareholders.

Q. What is your recommendation to the Commission?

A. I recommend that the Commission approve the Combined Projects and the Company's proposals for ratemaking treatment for the Combined Projects. Approval will provide certainty to the Company and enable it to move forward with the Combined Projects.

Q. Does this conclude your direct testimony?

A. Yes.

Rocky Mountain Power
Exhibit RMP___(JKL-1)
Docket No. 17-035-40
Witness: Jeffrey K. Larsen

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

Exhibit Accompanying Direct Testimony of Jeffrey K. Larsen

Revenue Requirement Overview

June 2017

Resource Tracking Mechanism

Revenue Requirement Overview – Combined Projects

Category	Base	New	Deferral
Capital Investment	Zero unless the assets or part of the assets have been included in a general rate case. After a rate case, the base will be the amount included in the test period, beginning on the rate effective date of that case.	Actual monthly beginning plant in-service balances associated with the Combined Projects, beginning with first assets placed in service.	The difference between the base and new columns will be included in the mechanism calculation until the amounts are fully included in a general rate case, at which time this will end.
Accumulated Depreciation Reserve	Same as capital investment.	Monthly depreciation reserve of Combined Projects.	
Accumulated Deferred Income Tax	Same as capital investment.	Actual accumulated deferred income tax balances associated with the Combined Projects.	
Operation & Maintenance Expense	Zero unless the assets or part of the assets have been included in a general rate case. After a rate case, the base will be the amount included in the test period, beginning on the rate effective date of that case.	Actual O&M expense for the Combined Projects.	
Depreciation Expense	Zero.	Actual monthly plant in-service balances associated with the Combined Projects less the base multiplied by current depreciation rates.	
Property Taxes	Zero.	Capital Investment deferral less the Depreciation Reserve deferral multiplied by the average property tax rate from the last rate case.	
Wind Tax	Zero.	Incremental energy production MWh associated with Wind Projects subject to the Wyoming Wind tax multiplied by the wind tax rate.	
NPC Savings	The EBA tracks and captures any incremental changes to wind production between NPC in base rates and actual NPC.	The EBA has a 100% pass through of the difference between base NPC and actual NPC. The RTM will capture any savings, if any, not included in the EBA related to incremental energy production associated with the Wind Projects, and pass these savings back to customers.	Any incremental wind production associated with the Wind Projects not in base rates will be multiplied by monthly HLH and LLH prices, (Four Corners for east resources) less wind integration costs.
Wheeling Revenues	Zero unless the Transmission Projects have been included, or partially included, in a general rate case. After a rate case, the base will be the amount included in the test period, beginning on the rate effective date of that case.	The EBA has a 100% pass through of wheeling revenues. The RTM will capture any incremental Transmission Projects wheeling revenues associated with the Transmission Project not included in the EBA.	Any incremental third-party wheeling revenues associated with the Transmission Projects, if any, not included in the EBA or in base rates
PTC	Zero until the next general rate case. After a rate case, the base will be the amount included in the test period, starting on the rate effective date, associated with the Wind Projects.	Actual MWh eligible for PTC produced by the Wind Projects multiplied by the production tax rate.	Difference between the base and actual. Tracked until Wind Project PTC's have expired, and have been reset to zero in base rates.

Rocky Mountain Power
Exhibit RMP___(JKL-2)
Docket No. 17-035-40
Witness: Jeffrey K. Larsen

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

Exhibit Accompanying Direct Testimony of Jeffrey K. Larsen

Example Annual RTM Deferral Calculation – Revenue Requirement

June 2017

Table 1

The Combined Projects Estimated Revenue Requirement Cost (Benefit)
$thousands

		2020	2021	2022	2023
1	Total Company Revenue Requirement	(15,868)	87,125	89,286	69,794
2	Utah Allocated	(6,764)	37,115	38,037	29,728
3	Utah EBA	(7,707)	(30,505)	(21,936)	(22,021)
4	Utah Deferral	942	67,620	59,973	51,750
5	Net Customer Impact	(6,764)	37,115	38,037	29,728

PacifiCorp
Utah
Combined Projects - Example Annual RTM Deferral Calculation
Revenue Requirement

Exhibit RMP___(JKL-2)

Line No.	$-Thousands	Reference	(a) 2020 Energy Gateway Total Company	(b) Factor	(c) Factor %	(d) Utah Allocated	(e) 2021 Energy Gateway Total Company	(f) Factor	(g) Factor %	(h) Utah Allocated	(i) 2022 Energy Gateway Total Company	(j) Factor	(k) Factor %	(l) Utah Allocated	(m) 2023 Energy Gateway Total Company	(n) Factor	(o) Factor %	(p) Utah Allocated
	Plant Revenue Requirement																	
1	Capital Investment	Footnote 1	172,071	SG	42.6283%	73,351	2,068,792	SG	42.6283%	881,891	2,086,917	SG	42.6283%	889,617	2,086,917	SG	42.6283%	889,617
2	Depreciation Reserve	Footnote 1	(404)	SG	42.6283%	(172)	(36,392)	SG	42.6283%	(15,513)	(95,042)	SG	42.6283%	(40,515)	(153,932)	SG	42.6283%	(65,619)
3	Accumulated DIT Balance	Footnote 1	(2,532)	SG	42.6283%	(1,079)	(197,503)	SG	42.6283%	(84,192)	(333,225)	SG	42.6283%	(142,048)	(412,834)	SG	42.6283%	(175,984)
4	Net Rate Base	sum of lines 1-3	169,134			72,099	1,834,896			782,185	1,658,651			707,055	1,520,151			648,015
5	Pre-Tax Rate of Return	line 37	10.649%			10.649%	10.649%			10.649%	10.649%			10.649%	10.649%			10.649%
6	Pre-Tax Return on Rate Base	line 4 * line 5	18,011			7,678	195,401			83,296	176,633			75,296	161,884			69,008
7	Wholesale Wheeling Revenue	Footnote 4	(989)	SG	42.6283%	(422)	(10,814)	SG	42.6283%	(4,610)	(10,470)	SG	42.6283%	(4,463)	(10,122)	SG	42.6283%	(4,315)
8	Operation & Maintenance	Footnote 3	3,196	SG	42.6283%	1,363	20,189	SG	42.6283%	8,606	20,757	SG	42.6283%	8,848	20,995	SG	42.6283%	8,950
9	Depreciation	Footnote 3	9,699	SG	42.6283%	4,135	58,351	SG	42.6283%	24,874	58,890	SG	42.6283%	25,104	58,890	SG	42.6283%	25,104
10	Property Taxes	Footnote 3	-	GPS	42.4704%	-	15,799	GPS	42.4704%	6,710	15,520	GPS	42.4704%	6,592	15,068	GPS	42.4704%	6,399
11	Wind Tax	Footnote 3	-	SG	42.6283%	-	-	SG	42.6283%	-	-	SG	42.6283%	-	712	SG	42.6283%	304
12	**Total Plant Revenue Requirement**	sum of lines 6-11	**29,918**			**12,754**	**278,926**			**118,877**	**261,330**			**111,376**	**247,428**			**105,450**
	Net Power Cost																	
13	NPC Incremental Savings	Footnote 3	(17,090)	SG	42.6283%	(7,285)	(60,746)	SG	42.6283%	(25,895)	(40,989)	SG	42.6283%	(17,473)	(41,537)	SG	42.6283%	(17,707)
	PTC Benefit																	
14	PTC Benefit	Footnote 3	(17,806)	SG	42.6283%	(7,590)	(81,319)	SG	42.6283%	(34,665)	(81,319)	SG	42.6283%	(34,665)	(84,446)	SG	42.6283%	(35,998)
15	PTC Benefit in Base Rates	Footnote 3	-	SG	42.6283%	-	-	SG	42.6283%	-	-	SG	42.6283%	-	-	SG	42.6283%	-
16	Net PTC	sum of lines 14 and 15	(17,806)			(7,590)	(81,319)			(34,665)	(81,319)			(34,665)	(84,446)			(35,998)
17	Gross- up for taxes	line 16 * (line 35 - 1)	(10,890)			(4,642)	(49,737)			(21,202)	(49,737)			(21,202)	(51,650)			(22,017)
18	PTC Revenue Requirement	sum of lines 16 and 17	(28,696)			(12,233)	(131,055)			(55,867)	(131,055)			(55,867)	(136,096)			(58,015)
19	**Rev. Requirement**	sum of lines 12, 13, 18	(15,868)			(6,764)	87,125			37,115	89,286			38,037	69,794			29,728
	Adjustment for EBA Pass-through																	
20	Wholesale Wheeling Revenue	line 7				(422)				(4,610)				(4,463)				(4,315)
21	Percentage included in EBA (100%)	UT EBA Sharing %				100%				100%				100%				100%
22	EBA Pass-through	line 20 * line 21				(422)				(4,610)				(4,463)				(4,315)
23	NPC Incremental Savings	line 13				(7,285)				(25,895)				(17,473)				(17,707)
24	Percentage included in EBA (100%)	UT EBA Sharing %				100%				100%				100%				100%
25	EBA Pass-through	line 23 * line 24				(7,285)				(25,895)				(17,473)				(17,707)
26	**Rev. Reqt. after EBA Pass-through**	line 19 - line 22 - line 25				942				67,620				59,973				51,750
27	**Total Deferral - UT Share**					942				67,620				59,973				51,750
28	**Net Customer Benefit**	sum of lines 22, 25, 27				(6,764)				37,115				38,037				29,728
	Deferral Balance - UT Share																	
29	Beginning Deferral Balance	line 33 of previous year				-				928				70,082				88,252
30	Monthly Deferral	line 27				942				67,620				59,973				51,750
31	Deferral Collection	Footnote 3				-				(619)				(47,031)				(82,195)
32	Carrying Charge	Footnote 3				(15)				2,153				5,228				4,664
33	**Ending Deferral Balance**	sum of lines 29 - 32				928				70,082				88,252				62,470

34	Federal/State Combined Tax Rate	JKL_4, line 5	37.951%	
35	Net to Gross Bump up Factor = (1/(1-tax rate))	JKL_4, line 6	1.6116	
36	Deferred Balance Carrying Charge	Footnote 2	6.00%	EBA carrying charge rate under Electric Service Schedule 94
37	Pretax Return	JKL_4, line 4	10.649%	13-035-184 Capital Structure & Cost - Ordered
38	Property Tax Rate	JKL_4, line 14	0.77%	Property Tax Expense as a percent of Net plant from 13-035-184
39	Utah SG Factor	JKL_4, line 15	42.6283%	
40	Utah GPS Factor	JKL_4, line 16	42.4704%	

Footnotes:
1) Capital balances equal the average of the monthly balances in JKL-3 with a one month delay
2) Carrying Charge (line 29) is applied to average monthly deferral balances
3) Equals the sum of each year's monthly values in JKL-3
4) Includes Wholesale Wheeling Revenue offset for transmission asset credit already in base rates

Rocky Mountain Power
Exhibit RMP___(JKL-3)
Docket No. 17-035-40
Witness: Jeffrey K. Larsen

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

Exhibit Accompanying Direct Testimony of Jeffrey K. Larsen

Example Monthly RTM Deferral Calculation – Revenue Requirement

June 2017

PacifiCorp
Utah
Combined Projects - Example Monthly RTM Deferral Calculation
Revenue Requirement

Line No.	$-Thousands	Reference	2020 January	2020 February	2020 March	2020 April	2020 May	2020 June	2020 July	2020 August	2020 September	2020 October	2020 November	2020 December
Total Company														
	Plant Revenue Requirement													
1	Capital Investment		-	-	-	-	-	-	-	-	-	-	2,064,848	2,064,848
2	Depreciation Reserve		-	-	-	-	-	-	-	-	-	-	(4,850)	(9,699)
3	Accumulated DIT Balance		-	-	-	-	-	-	-	-	-	-	(30,384)	(137,442)
4	Net Rate Base	sum of lines 1-3	-	-	-	-	-	-	-	-	-	-	2,029,614	1,917,706
5	Pre-Tax Rate of Return	line 37	10.649%	10.649%	10.649%	10.649%	10.649%	10.649%	10.649%	10.649%	10.649%	10.649%	10.649%	10.649%
6	Pre-Tax Return on Rate Base	Footnote 1	-	-	-	-	-	-	-	-	-	-	-	18,011
7	Wholesale Wheeling Revenue	Footnote 2	-	-	-	-	-	-	-	-	-	-	(131)	(858)
8	Operation & Maintenance		-	-	-	-	-	-	-	-	-	-	1,598	1,598
9	Depreciation		-	-	-	-	-	-	-	-	-	-	4,850	4,850
10	Property Taxes	Prior December (line 1 + line 2) x line 37	-	-	-	-	-	-	-	-	-	-	-	-
11	Wind Tax		-	-	-	-	-	-	-	-	-	-	-	-
12	**Total Plant Revenue Requirement**	sum of lines 6-11	-	-	-	-	-	-	-	-	-	-	6,316	23,602
	Net Power Cost													
13	NPC Incremental Savings	See Exhibit JKL-4	-	-	-	-	-	-	-	-	-	-	(8,545)	(8,545)
	PTC Benefit													
14	PTC Benefit		-	-	-	-	-	-	-	-	-	-	(8,903)	(8,903)
15	PTC Benefit in Base Rates		-	-	-	-	-	-	-	-	-	-	-	-
16	Net PTC	sum of lines 14 and 15	-	-	-	-	-	-	-	-	-	-	(8,903)	(8,903)
17	Gross- up for taxes	line 16 * (line 35 - 1)	-	-	-	-	-	-	-	-	-	-	(5,445)	(5,445)
18	PTC Revenue Requirement	sum of line 16 and 17	-	-	-	-	-	-	-	-	-	-	(14,348)	(14,348)
19	**Rev. Requirement**	sum of lines 12, 13 and 18	-	-	-	-	-	-	-	-	-	-	(16,577)	709
	Adjustment for EBA Pass-through													
20	Wholesale Wheeling Revenue	line 7	-	-	-	-	-	-	-	-	-	-	(131)	(858)
21	Percentage included in EBA (100%)		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22	EBA Pass-through	line 20 * line 21	-	-	-	-	-	-	-	-	-	-	(131)	(858)
23	NPC Incremental Savings	line 13	-	-	-	-	-	-	-	-	-	-	(8,545)	(8,545)
24	Percentage included in EBA (100%)		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
25	EBA Pass-through	line 23 * line 24	-	-	-	-	-	-	-	-	-	-	(8,545)	(8,545)
26	**Rev. Reqt after EBA Pass-through**	line 19 - line 22 - line 25	-	-	-	-	-	-	-	-	-	-	(7,900)	10,111
Utah Allocated														
27	**Total Deferral - UT Share**	(Ln 26 - ln 10) * ln 39 + ln 10 * ln 40	-	-	-	-	-	-	-	-	-	-	(3,368)	4,310
28	**Net Customer Benefit**	(line 22 + line 25) * line 36 + line 24	-	-	-	-	-	-	-	-	-	-	(7,066)	302
	Deferral Balance - UT Share													
29	Beginning Deferral Balance	line 33 of previous month	-	-	-	-	-	-	-	-	-	-	-	(3,376)
30	Monthly Deferral	line 24	-	-	-	-	-	-	-	-	-	-	(3,368)	4,310
31	Deferral Collection	Footnote 3	-	-	-	-	-	-	-	-	-	-	-	-
32	Carrying Charge	(ln 29+ .5 * (ln 30 + ln 31)) * ln 36	-	-	-	-	-	-	-	-	-	-	(8)	(6)
33	**Ending Deferral Balance**	sum of lines 29-32	-	-	-	-	-	-	-	-	-	-	(3,376)	928
34	Federal/State Combined Tax Rate	JKL_4, line 5	37.951%											
35	Net to Gross Bump up Factor = (1/(1-tax rate))	JKL_4, line 6	1.6116											
36	Deferred Balance Carrying Charge	UT EBA rate; see JKL_2 line 33	6.00%											
37	Pretax Return	JKL_4, line 4	10.649%											
38	Property Tax Rate	JKL_4, line 14	0.77%											
39	Utah SG Factor	JKL_4, line 15	42.6283%											
40	Utah GPS Factor	JKL_4, line 16	42.4704%											

Footnotes:

1) Pre-tax Return, line 6, is calculated as the rate of return (line 5) multiplied by the ending net rate base of the prior month (line 4) divided by 12

2) Includes Wholesale Wheeling Revenue offset for transmission asset credit already in base rates

3) For illustrative purposes, collection of December's balance is assumed to be collected beginning the following May 1

PacifiCorp
Utah
Combined Projects - Example Monthly RTM Deferral Calculation
Revenue Requirement

Line No.	$-Thousands	Reference	2021 January	2021 February	2021 March	2021 April	2021 May	2021 June	2021 July	2021 August	2021 September	2021 October	2021 November	2021 December
Total Company														
	Plant Revenue Requirement													
1	Capital Investment		2,064,848	2,064,848	2,064,848	2,064,848	2,069,058	2,069,058	2,069,058	2,069,058	2,069,058	2,069,058	2,086,917	2,086,917
2	Depreciation Reserve		(14,549)	(19,399)	(24,248)	(29,098)	(33,954)	(38,810)	(43,667)	(48,523)	(53,379)	(58,235)	(63,143)	(68,050)
3	Accumulated DIT Balance		(137,442)	(137,442)	(177,483)	(177,483)	(177,483)	(217,524)	(217,524)	(217,524)	(257,564)	(257,564)	(257,564)	(297,605)
4	Net Rate Base	sum of lines 1-3	1,912,856	1,908,007	1,863,116	1,858,267	1,857,621	1,812,724	1,807,867	1,803,011	1,758,114	1,753,258	1,766,210	1,721,262
5	Pre-Tax Rate of Return	line 37	10.649%	10.649%	10.649%	10.649%	10.649%	10.649%	10.649%	10.649%	10.649%	10.649%	10.649%	10.649%
6	Pre-Tax Return on Rate Base	Footnote 1	17,018	16,975	16,932	16,534	16,491	16,485	16,087	16,044	16,000	15,602	15,559	15,674
7	Wholesale Wheeling Revenue	Footnote 2	(911)	(910)	(909)	(903)	(903)	(906)	(901)	(899)	(898)	(893)	(892)	(890)
8	Operation & Maintenance		1,682	1,682	1,682	1,682	1,682	1,682	1,682	1,682	1,682	1,682	1,682	1,682
9	Depreciation		4,850	4,850	4,850	4,850	4,856	4,856	4,856	4,856	4,856	4,856	4,908	4,908
10	Property Taxes	Prior December (line 1 + line 2) x line 37	1,317	1,317	1,317	1,317	1,317	1,317	1,317	1,317	1,317	1,317	1,317	1,317
11	Wind Tax		-	-	-	-	-	-	-	-	-	-	-	-
12	**Total Plant Revenue Requirement**	sum of lines 6-11	23,956	23,914	23,872	23,479	23,443	23,434	23,041	22,999	22,957	22,564	22,574	22,690
	Net Power Cost													
13	NPC Incremental Savings	See Exhibit JKL-4	(5,062)	(5,062)	(5,062)	(5,062)	(5,062)	(5,062)	(5,062)	(5,062)	(5,062)	(5,062)	(5,062)	(5,062)
	PTC Benefit													
14	PTC Benefit		(6,777)	(6,777)	(6,777)	(6,777)	(6,777)	(6,777)	(6,777)	(6,777)	(6,777)	(6,777)	(6,777)	(6,777)
15	PTC Benefit in Base Rates		-	-	-	-	-	-	-	-	-	-	-	-
16	Net PTC	sum of lines 14 and 15	(6,777)	(6,777)	(6,777)	(6,777)	(6,777)	(6,777)	(6,777)	(6,777)	(6,777)	(6,777)	(6,777)	(6,777)
17	Gross- up for taxes	line 16 * (line 35 - 1)	(4,145)	(4,145)	(4,145)	(4,145)	(4,145)	(4,145)	(4,145)	(4,145)	(4,145)	(4,145)	(4,145)	(4,145)
18	PTC Revenue Requirement	sum of line 16 and 17	(10,921)	(10,921)	(10,921)	(10,921)	(10,921)	(10,921)	(10,921)	(10,921)	(10,921)	(10,921)	(10,921)	(10,921)
19	**Rev. Requirement**	sum of lines 12, 13 and 18	7,973	7,931	7,889	7,496	7,460	7,451	7,058	7,016	6,974	6,581	6,590	6,706
	Adjustment for EBA Pass-through													
20	Wholesale Wheeling Revenue	line 7	(911)	(910)	(909)	(903)	(903)	(906)	(901)	(899)	(898)	(893)	(892)	(890)
21	Percentage included in EBA (100%)		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22	EBA Pass-through	line 20 * line 21	(911)	(910)	(909)	(903)	(903)	(906)	(901)	(899)	(898)	(893)	(892)	(890)
23	NPC Incremental Savings	line 13	(5,062)	(5,062)	(5,062)	(5,062)	(5,062)	(5,062)	(5,062)	(5,062)	(5,062)	(5,062)	(5,062)	(5,062)
24	Percentage included in EBA (100%)		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
25	EBA Pass-through	line 23 * line 24	(5,062)	(5,062)	(5,062)	(5,062)	(5,062)	(5,062)	(5,062)	(5,062)	(5,062)	(5,062)	(5,062)	(5,062)
26	**Rev. Req't after EBA Pass-through**	line 19 - line 22 - line 25	13,946	13,903	13,860	13,461	13,425	13,419	13,021	12,978	12,934	12,536	12,544	12,659
Utah Allocated														
27	**Total Deferral - UT Share**	(Ln 26 - ln 10) * ln 39 + ln 10 * ln 40	5,943	5,924	5,906	5,736	5,721	5,718	5,548	5,530	5,512	5,342	5,345	5,394
28	**Net Customer Benefit**	(line 22 + line 25) * line 36 + line 24	3,397	3,379	3,361	3,193	3,178	3,174	3,007	2,989	2,971	2,803	2,807	2,857
	Deferral Balance - UT Share													
29	Beginning Deferral Balance	line 33 of previous month	928	6,890	12,864	18,849	24,694	30,475	36,282	41,948	47,624	53,310	58,855	64,430
30	Monthly Deferral	line 24	5,943	5,924	5,906	5,736	5,721	5,718	5,548	5,530	5,512	5,342	5,345	5,394
31	Deferral Collection	Footnote 3	-	-	-	-	(77)	(77)	(77)	(77)	(77)	(77)	(77)	(77)
32	Carrying Charge	(ln 29+ .5 * (ln 30 + ln 31)) * ln 36	19	49	79	109	138	166	195	223	252	280	307	335
33	**Ending Deferral Balance**	sum of lines 29-32	6,890	12,864	18,849	24,694	30,475	36,282	41,948	47,624	53,310	58,855	64,430	70,082
34	Federal/State Combined Tax Rate	JKL_4, line 5												
35	Net to Gross Bump up Factor = (1/(1-tax rate))	JKL_4, line 6												
36	Deferred Balance Carrying Charge	UT EBA rate; see JKL_2 line 33												
37	Pretax Return	JKL_4, line 4												
38	Property Tax Rate	JKL_4, line 14												
39	Utah SG Factor	JKL_4, line 15												
40	Utah GPS Factor	JKL_4, line 16												

Footnotes:

1) Pre-tax Return, line 6, is calculated as the rate of return (line 5) multiplied by the ending net rate base of the prior month (line 4) divided by 12

2) Includes Wholesale Wheeling Revenue offset for transmission asset credit already in base rates

3) For illustrative purposes, collection of December's balance is assumed to be collected beginning the following May 1

PacifiCorp
Utah
Combined Projects - Example Monthly RTM Deferral Calculation
Revenue Requirement

Line No.	$-Thousands	Reference	2022 January	2022 February	2022 March	2022 April	2022 May	2022 June	2022 July	2022 August	2022 September	2022 October	2022 November	2022 December
Total Company														
	Plant Revenue Requirement													
1	Capital Investment		2,086,917	2,086,917	2,086,917	2,086,917	2,086,917	2,086,917	2,086,917	2,086,917	2,086,917	2,086,917	2,086,917	2,086,917
2	Depreciation Reserve		(72,958)	(77,865)	(82,773)	(87,680)	(92,588)	(97,495)	(102,403)	(107,310)	(112,218)	(117,126)	(122,033)	(126,941)
3	Accumulated DIT Balance		(297,605)	(297,605)	(321,351)	(321,351)	(321,351)	(345,098)	(345,098)	(345,098)	(368,844)	(368,844)	(368,844)	(392,590)
4	Net Rate Base	sum of lines 1-3	1,716,354	1,711,447	1,682,793	1,677,885	1,672,978	1,644,324	1,639,417	1,634,509	1,605,855	1,600,948	1,596,040	1,567,386
5	Pre-Tax Rate of Return	line 37	10.649%	10.649%	10.649%	10.649%	10.649%	10.649%	10.649%	10.649%	10.649%	10.649%	10.649%	10.649%
6	Pre-Tax Return on Rate Base	Footnote 1	15,275	15,231	15,188	14,934	14,890	14,847	14,592	14,549	14,505	14,251	14,207	14,164
7	Wholesale Wheeling Revenue	Footnote 2	(885)	(883)	(882)	(877)	(876)	(875)	(870)	(869)	(868)	(863)	(862)	(860)
8	Operation & Maintenance		1,730	1,730	1,730	1,730	1,730	1,730	1,730	1,730	1,730	1,730	1,730	1,730
9	Depreciation		4,908	4,908	4,908	4,908	4,908	4,908	4,908	4,908	4,908	4,908	4,908	4,908
10	Property Taxes	Prior December (line 1 + line 2) x line 37	1,293	1,293	1,293	1,293	1,293	1,293	1,293	1,293	1,293	1,293	1,293	1,293
11	Wind Tax		-	-	-	-	-	-	-	-	-	-	-	-
12	**Total Plant Revenue Requirement**	sum of lines 6-11	22,321	22,279	22,236	21,987	21,945	21,902	21,653	21,610	21,568	21,319	21,276	21,234
	Net Power Cost													
13	NPC Incremental Savings	See Exhibit JKL-4	(3,416)	(3,416)	(3,416)	(3,416)	(3,416)	(3,416)	(3,416)	(3,416)	(3,416)	(3,416)	(3,416)	(3,416)
	PTC Benefit													
14	PTC Benefit		(6,777)	(6,777)	(6,777)	(6,777)	(6,777)	(6,777)	(6,777)	(6,777)	(6,777)	(6,777)	(6,777)	(6,777)
15	PTC Benefit in Base Rates		-	-	-	-	-	-	-	-	-	-	-	-
16	Net PTC	sum of lines 14 and 15	(6,777)	(6,777)	(6,777)	(6,777)	(6,777)	(6,777)	(6,777)	(6,777)	(6,777)	(6,777)	(6,777)	(6,777)
17	Gross- up for taxes	line 16 * (line 35 - 1)	(4,145)	(4,145)	(4,145)	(4,145)	(4,145)	(4,145)	(4,145)	(4,145)	(4,145)	(4,145)	(4,145)	(4,145)
18	PTC Revenue Requirement	sum of line 16 and 17	(10,921)	(10,921)	(10,921)	(10,921)	(10,921)	(10,921)	(10,921)	(10,921)	(10,921)	(10,921)	(10,921)	(10,921)
19	**Rev. Requirement**	sum of lines 12, 13 and 18	7,984	7,942	7,899	7,650	7,608	7,565	7,316	7,273	7,231	6,982	6,939	6,897
	Adjustment for EBA Pass-through													
20	Wholesale Wheeling Revenue	line 7	(885)	(883)	(882)	(877)	(876)	(875)	(870)	(869)	(868)	(863)	(862)	(860)
21	Percentage included in EBA (100%)		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22	EBA Pass-through	line 20 * line 21	(885)	(883)	(882)	(877)	(876)	(875)	(870)	(869)	(868)	(863)	(862)	(860)
23	NPC Incremental Savings	line 13	(3,416)	(3,416)	(3,416)	(3,416)	(3,416)	(3,416)	(3,416)	(3,416)	(3,416)	(3,416)	(3,416)	(3,416)
24	Percentage included in EBA (100%)		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
25	EBA Pass-through	line 23 * line 24	(3,416)	(3,416)	(3,416)	(3,416)	(3,416)	(3,416)	(3,416)	(3,416)	(3,416)	(3,416)	(3,416)	(3,416)
26	**Rev. Reqt after EBA Pass-through**	line 19 - line 22 - line 25	12,284	12,241	12,197	11,943	11,899	11,856	11,602	11,558	11,515	11,260	11,217	11,173
Utah Allocated														
27	**Total Deferral - UT Share**	(Ln 26 - ln 10) * ln 39 + ln 10 * ln 40	5,235	5,216	5,197	5,089	5,070	5,052	4,944	4,925	4,906	4,798	4,779	4,761
28	**Net Customer Benefit**	(line 22 + line 25) * line 36 + line 24	3,401	3,383	3,365	3,259	3,241	3,223	3,117	3,098	3,080	2,974	2,956	2,938
	Deferral Balance - UT Share													
29	Beginning Deferral Balance	line 33 of previous month	70,082	75,603	81,132	86,671	92,129	91,818	91,487	91,045	90,583	90,100	89,505	88,889
30	Monthly Deferral	line 24	5,235	5,216	5,197	5,089	5,070	5,052	4,944	4,925	4,906	4,798	4,779	4,761
31	Deferral Collection	Footnote 3	(77)	(77)	(77)	(77)	(5,840)	(5,840)	(5,840)	(5,840)	(5,840)	(5,840)	(5,840)	(5,840)
32	Carrying Charge	(ln 29+ .5 * (ln 30 + ln 31)) * ln 36	363	391	418	446	459	457	455	453	451	448	445	442
33	**Ending Deferral Balance**	sum of lines 29-32	75,603	81,132	86,671	92,129	91,818	91,487	91,045	90,583	90,100	89,505	88,889	88,252
34	Federal/State Combined Tax Rate	JKL_4, line 5												
35	Net to Gross Bump up Factor = (1/(1-tax rate))	JKL_4, line 6												
36	Deferred Balance Carrying Charge	UT EBA rate; see JKL_2 line 33												
37	Pretax Return	JKL_4, line 4												
38	Property Tax Rate	JKL_4, line 14												
39	Utah SG Factor	JKL_4, line 15												
40	Utah GPS Factor	JKL_4, line 16												

Footnotes:

1) Pre-tax Return, line 6, is calculated as the rate of return (line 5) multiplied by the ending net rate base of the prior month (line 4) divided by 12

2) Includes Wholesale Wheeling Revenue offset for transmission asset credit already in base rates

3) For illustrative purposes, collection of December's balance is assumed to be collected beginning the following May 1

PacifiCorp
Utah
Combined Projects - Example Monthly RTM Deferral Calculation
Revenue Requirement

Line No.	$-Thousands	Reference	2023 January	2023 February	2023 March	2023 April	2023 May	2023 June	2023 July	2023 August	2023 September	2023 October	2023 November	2023 December
Total Company														
	Plant Revenue Requirement													
1	Capital Investment		2,086,917	2,086,917	2,086,917	2,086,917	2,086,917	2,086,917	2,086,917	2,086,917	2,086,917	2,086,917	2,086,917	2,086,917
2	Depreciation Reserve		(131,848)	(136,756)	(141,663)	(146,571)	(151,478)	(156,386)	(161,293)	(166,201)	(171,108)	(176,016)	(180,923)	(185,831)
3	Accumulated DIT Balance		(392,590)	(392,590)	(406,086)	(406,086)	(406,086)	(419,582)	(419,582)	(419,582)	(433,078)	(433,078)	(433,078)	(446,574)
4	Net Rate Base	sum of lines 1-3	1,562,479	1,557,571	1,539,168	1,534,260	1,529,353	1,510,949	1,506,042	1,501,134	1,482,731	1,477,824	1,472,916	1,454,513
5	Pre-Tax Rate of Return	line 37	10.649%	10.649%	10.649%	10.649%	10.649%	10.649%	10.649%	10.649%	10.649%	10.649%	10.649%	10.649%
6	Pre-Tax Return on Rate Base	Footnote 1	13,909	13,866	13,822	13,659	13,616	13,572	13,409	13,365	13,322	13,158	13,115	13,071
7	Wholesale Wheeling Revenue	Footnote 2	(855)	(854)	(852)	(848)	(847)	(846)	(841)	(840)	(839)	(835)	(833)	(832)
8	Operation & Maintenance		1,750	1,750	1,750	1,750	1,750	1,750	1,750	1,750	1,750	1,750	1,750	1,750
9	Depreciation		4,908	4,908	4,908	4,908	4,908	4,908	4,908	4,908	4,908	4,908	4,908	4,908
10	Property Taxes	Prior December (line 1 + line 2) x line 37	1,256	1,256	1,256	1,256	1,256	1,256	1,256	1,256	1,256	1,256	1,256	1,256
11	Wind Tax		59	59	59	59	59	59	59	59	59	59	59	59
12	**Total Plant Revenue Requirement**	sum of lines 6-11	21,027	20,984	20,942	20,783	20,741	20,698	20,540	20,497	20,455	20,296	20,253	20,211
	Net Power Cost													
13	NPC Incremental Savings	See Exhibit JKL-4	(3,461)	(3,461)	(3,461)	(3,461)	(3,461)	(3,461)	(3,461)	(3,461)	(3,461)	(3,461)	(3,461)	(3,461)
	PTC Benefit													
14	PTC Benefit		(7,037)	(7,037)	(7,037)	(7,037)	(7,037)	(7,037)	(7,037)	(7,037)	(7,037)	(7,037)	(7,037)	(7,037)
15	PTC Benefit in Base Rates		-	-	-	-	-	-	-	-	-	-	-	-
16	Net PTC	sum of lines 14 and 15	(7,037)	(7,037)	(7,037)	(7,037)	(7,037)	(7,037)	(7,037)	(7,037)	(7,037)	(7,037)	(7,037)	(7,037)
17	Gross- up for taxes	line 16 * (line 35 - 1)	(4,304)	(4,304)	(4,304)	(4,304)	(4,304)	(4,304)	(4,304)	(4,304)	(4,304)	(4,304)	(4,304)	(4,304)
18	PTC Revenue Requirement	sum of line 16 and 17	(11,341)	(11,341)	(11,341)	(11,341)	(11,341)	(11,341)	(11,341)	(11,341)	(11,341)	(11,341)	(11,341)	(11,341)
19	**Rev. Requirement**	sum of lines 12, 13 and 18	6,224	6,182	6,139	5,980	5,938	5,896	5,737	5,694	5,652	5,493	5,451	5,408
	Adjustment for EBA Pass-through													
20	Wholesale Wheeling Revenue	line 7	(855)	(854)	(852)	(848)	(847)	(846)	(841)	(840)	(839)	(835)	(833)	(832)
21	Percentage included in EBA (100%)		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
22	EBA Pass-through	line 20 * line 21	(855)	(854)	(852)	(848)	(847)	(846)	(841)	(840)	(839)	(835)	(833)	(832)
23	NPC Incremental Savings	line 13	(3,461)	(3,461)	(3,461)	(3,461)	(3,461)	(3,461)	(3,461)	(3,461)	(3,461)	(3,461)	(3,461)	(3,461)
24	Percentage included in EBA (100%)		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
25	EBA Pass-through	line 23 * line 24	(3,461)	(3,461)	(3,461)	(3,461)	(3,461)	(3,461)	(3,461)	(3,461)	(3,461)	(3,461)	(3,461)	(3,461)
26	**Rev. Req't after EBA Pass-through**	line 19 - line 22 - line 25	10,540	10,497	10,453	10,290	10,246	10,203	10,039	9,996	9,952	9,789	9,745	9,702
Utah Allocated														
27	**Total Deferral - UT Share**	(Ln 26 - ln 10) * ln 39 + ln 10 * ln 40	4,491	4,473	4,454	4,384	4,366	4,347	4,278	4,259	4,241	4,171	4,152	4,134
28	**Net Customer Benefit**	(line 22 + line 25) * line 36 + line 24	2,651	2,633	2,615	2,547	2,529	2,511	2,443	2,425	2,407	2,340	2,322	2,303
	Deferral Balance - UT Share													
29	Beginning Deferral Balance	line 33 of previous month	88,252	87,341	86,406	85,449	84,417	81,843	79,237	76,549	73,829	71,077	68,241	65,372
30	Monthly Deferral	line 24	4,491	4,473	4,454	4,384	4,366	4,347	4,278	4,259	4,241	4,171	4,152	4,134
31	Deferral Collection	Footnote 3	(5,840)	(5,840)	(5,840)	(5,840)	(7,354)	(7,354)	(7,354)	(7,354)	(7,354)	(7,354)	(7,354)	(7,354)
32	Carrying Charge	(ln 29+ .5 * (ln 30 + ln 31)) * ln 36	438	433	429	424	415	402	388	375	361	347	333	319
33	**Ending Deferral Balance**	sum of lines 29-32	87,341	86,406	85,449	84,417	81,843	79,237	76,549	73,829	71,077	68,241	65,372	62,470
34	Federal/State Combined Tax Rate	JKL_4, line 5												
35	Net to Gross Bump up Factor = (1/(1-tax rate))	JKL_4, line 6												
36	Deferred Balance Carrying Charge	UT EBA rate; see JKL_2 line 33												
37	Pretax Return	JKL_4, line 4												
38	Property Tax Rate	JKL_4, line 14												
39	Utah SG Factor	JKL_4, line 15												
40	Utah GPS Factor	JKL_4, line 16												

Footnotes:

1) Pre-tax Return, line 6, is calculated as the rate of return (line 5) multiplied by the ending net rate base of the prior month (line 4) divided by 12

2) Includes Wholesale Wheeling Revenue offset for transmission asset credit already in base rates

3) For illustrative purposes, collection of December's balance is assumed to be collected beginning the following May 1

Total Plant Revenue Requirement (Lines 1 - 12, 37):
Exhibit JKL-3 shows the calculation of the RTM revenue requirement deferral described in my testimony. The calculation starts with total Company amounts on lines 1 - 26 to calculate the Utah specific amounts on lines 27 - 33. To calculate the return on rate base associated with the combined investment, net rate base is calculated on a monthly basis. The net rate base balance on line 4 includes the combined investment in wind and transmission resources, along with the associated impacts on the depreciation reserve and accumulated DIT Balance. The monthly beginning net rate base (the final amount from the prior month) is then multiplied by the pre-tax Weighted Average Cost of Capital ("WACC") from the last Utah general rate case on line 5 to determine the Company's pre-tax return on rate base on line 6. The example uses the pre-tax WACC from Docket No. 13-035-15. The total plant revenue requirement is calculated by taking the return on rate base shown on line 6 and adding wholesale wheeling revenue, O&M expense, depreciation expense, property taxes and wind tax on lines 7 - 11 to determine the total plant revenue requirement on line 12. Wholesale wheeling revenue on line 7 reflects the 3rd party wheeling revenue associated with the new transmission investment and is multiplied by one hundred percent on line 21 to determine the amount of wheeling revenue that will be returned to customers through the sharing band of the EBA.

Net Power Costs (Line 13):
The total company incremental NPC savings associated with new wind resources is shown on line 13. The incremental NPC savings associated with the new wind projects are multiplied by one hundred percent on line 24 to determine the amount of the NPC savings that will be returned to customers through the sharing band of the EBA.

PTC Benefits (Lines 14-18, 34, 35):
Lines 14-18 show the calculation of the PTC benefits associated with the new wind resources. The actual PTC sales are grossed-up for taxes using the net-to-gross bump-up factor from the Company's last general rate case (shown on line 35) to derive the PTC revenue requirement on line 18. The tax gross-up is necessary for customers to get the full revenue requirement benefit of the PTCs and is calculated using the federal and state combined tax rate shown on line 34, which was also included in the last general rate case.

Deferral Balance (Lines 19 – 30):
The Utah share of the net deferral begins by calculating the total combined project revenue requirement on line 19, which is the sum of Total Plant Revenue Requirement on line 12, NPC Incremental Savings on line 13, and PTC Revenue Requirement on line 18. The Wholesale Wheeling Revenue pass-through on line 22 and the NPC EBA pass-through on line 25 are subtracted to provide the Revenue Requirement after EBA Pass-through on line 26. The Net Customer Benefit (line 28) is the sum of the EBA Pass-throughs (line 22 and line 25) and the Total Deferral - Utah Share (line 27). The carrying charge, shown on line 32 is calculated using the Commission-authorized rate on line 36 and is consistent with the calculations used in the Company's other mechanisms such as the EBA. As described earlier, each month the total-Company RTM revenue requirement will be calculated as illustrated on Exhibit JKL-3 to align with the resources included in the EBA. Once per year on a calendar-year basis, the Company will sum the monthly RTM revenue requirement entries to prepare the annual RTM application for filing with the Commission on March 15, with an interim rate effective date that corresponds with the EBA application, May 1.

Rocky Mountain Power
Exhibit RMP___(JKL-4)
Docket No. 17-035-40
Witness: Jeffrey K. Larsen

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

Exhibit Accompanying Direct Testimony of Jeffrey K. Larsen

Capital Structure, Property Tax Rate, and Net Power Cost Description

June 2017

PacifiCorp
Utah
Combined Projects - Capital Structure, Income Tax Rate, Property Tax Rate
Allocation Factors and Net Power Cost Description

13-035-184 Capital Structure & Cost
Effective 9/1/2014

Line no.	Capital Structure	Capital Structure	Capital Cost	Weighted Cost	Pre-Tax Cost
1	Debt	48.556%	5.200%	2.525%	2.525%
2	Preferred	0.016%	6.753%	0.001%	0.002%
3	Common	51.428%	9.800%	5.040%	8.123%
4			**TOTAL**	**7.566%**	**10.649%**
5	Consolidated Tax Rate		37.951%		
6	Tax Gross-up factor for PTC = (1/(1 - tax rate))		1.6116		
	Property Tax Calculation as filed in Docket Number 13-035-184				
7	Total Company				134,961,526
8	Utah GPS Factor				42.4704%
9	Utah Property Taxes				57,318,700
10	Utah Gross EPIS				10,912,081,614
11	Utah Accum. Depr.				(3,234,910,020)
12	Utah Accum. Amort.				(221,249,967)
13	Utah Net EPIS				7,455,921,626
14	Estimated Utah Property Tax Rate				0.769%
15	Utah SG Factor - Docket No. 13-035-184				42.6283%
16	Utah GPS Factor - Docket No. 13-035-184				42.4704%

Net Power Cost Incremental Savings Calculation and Definitions

$$Incremental\ Generation = Wind\ Plant\ Generation\ MWh - Base\ Wind\ Plant\ Generation\ MWh$$

$$\begin{aligned} NPC\ Incremental\ Savings \\ &= [Incremental\ Gen_{HLH} \times (Monthly\ Market\ Price_{HLH} - Integration\ Costs)] \\ &+ [Incremental\ Gen_{LLH} \times (Monthly\ Market\ Price_{LLH} - Integration\ Costs)] \end{aligned}$$

$$RTM\ NPC\ Benefit = NPC\ Incremental\ Savings \times EBA\ Sharing\ Band, if\ applicable$$

Where:

Incremental Generation = The increase in generation at the wind plants due to the Wind Projects
Wind Plant Generation MWh = The wind plant generation associated with the Wind Projects
Base Wind Plant Generation MWh = The wind plant generation associated with the Wind Projects that is included in base rates.
$Incremental\ Gen_{HLH}$ *= The increase in generation at the wind plant due to the Wind Projects during heavy load hours*
$Incremental\ Gen_{LLH}$ *= The increase in generation at the wind plant due to Wind Projects during light load hours*
$Monthly\ Market\ Price_{HLH}$ *= Heavy load hour monthly market price*
$Monthly\ Market\ Price_{LLH}$ *= Light load hour monthly market price*
Integration Costs = Wind integration costs from the most recent IRP
RTM NPC Benefit = The NPC benefit absorbed by the Company in the EBA as a result of the sharing band, if applicable

Rocky Mountain Power
Exhibit RMP___(JKL-5)
Docket No. 17-035-40
Witness: Jeffrey K. Larsen

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

Exhibit Accompanying Direct Testimony of Jeffrey K. Larsen

Proposed Schedule

June 2017

ROCKY MOUNTAIN POWER

ELECTRIC SERVICE SCHEDULE NO. 97B

STATE OF UTAH

Resource Tracking Mechanism (RTM)
Wyoming Wind and Transmission Projects (Combined Projects)

AVAILABILITY: At any point on the Company's interconnected system.

APPLICATION: This Schedule shall be applicable to all retail tariff Customers taking service under the terms contained in this Tariff. All retail tariff rate schedules shall be subject to the rate elements in this Schedule, which tracks the costs and benefits associated with the wind projects and transmission projects (the "Combined Projects") as approved in Docket Number 17-035-40.

DEFINITIONS:

RTM: The Resource Tracking Mechanism.

RTM Filing Date: The RTM Filing Date shall be on or about March 15 of each year under normal circumstances.

RTM Rate Effective Date: The RTM Rate Effective Date shall be May 1 of each year on an interim basis under normal circumstances, subject to investigation, protest, hearing and final order of the Commission. The Company may file a properly executed application with the Commission to implement the RTM Rate Adjustment on an interim basis, and if approved by the Commission, the RTM Rate Adjustment shall continue until a final order is issued by the Commission and is adjusted accordingly.

Deferred RTM Comparison Period: The historic 12-month period beginning January 1 and extending through December 31 preceding the RTM Rate Effective Date.

(continued)

ELECTRIC SERVICE SCHEDULE NO. 97B – Continued

RTM Deferral: The RTM Deferral for the Combined Projects is the sum of the total Plant Revenue Requirement, RTM NPC Benefits, RTM Wheeling Revenues and RTM PTC Benefits for the resources approved for recovery in this mechanism that are not otherwise reflected in retail rates. Once the Plant Revenue Requirement, RTM NPC Benefits, RTM Wheeling Revenues and RTM PTC Benefits for eligible resources are reflected in base rates following a general rate case, the RTM Deferral will consist of the difference between the Base PTC Benefits set in base rates and New PTC Benefits calculated from actual megawatt-hour generation for the Wind Projects. The applicable FERC accounts where the costs and benefits will most likely be booked, as defined in Code of Federal Regulations, Subchapter C, Part 101, are listed, where applicable, with the noted clarifications and exclusions.

Plant Revenue Requirement: Consists of the capital investment, accumulated depreciation, accumulated deferred income tax, operations and maintenance expense, depreciation expense, Wyoming wind generation tax and property tax associated with the Combined Projects.

Net Power Cost or NPC: Comprised of fuel, wholesale purchases and sales of electricity (including financial hedges), wheeling expenses, and wholesale purchases and sales of natural gas (including financial hedges), as provided for in Schedule 94, Energy Balancing Account (EBA).

RTM NPC Benefit: The RTM will capture any savings not included in the EBA related to incremental energy production associated with the Wind Projects, and pass these savings back to customers.

Incremental Generation: The increase in generation due to the Wind Projects. The Incremental Generation is calculated as the new wind plant generation MWh less the Base Wind Plant Generation MWh.

Wind Plant Generation MWh: The wind plant generation associated with the Wind Projects.

Base Wind Plant Generation MWh: The wind plant generation associated with the Wind Projects that is included in base rates.

Incremental Generation$_{HLH}$: The increase in generation due to the Wind Projects during heavy load hours.

Incremental Generation$_{LLH}$: The increase in generation due to the Wind Projects during light load hours.

Monthly Market Price$_{HLH}$: The heavy load hour monthly market price.

Monthly Market Price$_{LLH}$: The light load hour monthly market price.

(continued)

ELECTRIC SERVICE SCHEDULE NO. 97B – Continued

Integration Costs: The wind integration costs from the most recent Integrated Resource Plan.

RTM Wheeling Revenues: The RTM will capture any benefits not included in the EBA related to incremental wholesale wheeling revenues associated with the Transmission Projects, and pass these savings back to customers. Wheeling Revenues not otherwise captured and reflected through base rates or the EBA will be calculated as the revenue requirement of the Transmission Projects, multiplied by the percentage of transmission revenue requirement paid by third-party transmission customers.

Production Tax Credits or PTCs: Federal tax credits for energy produced from wind energy facilities. The credit is generally applicable for a period of 10 years after the wind facility is operational and is calculated by taking the actual megawatt-hours of generation from the new wind turbines multiplied by the applicable IRS rate.

New PTC Benefits: Calculated as actual MWh eligible for PTCs produced by the Wind Projects multiplied by the production tax rate. This amount is grossed up using the tax gross-up rate from the most recently approved general rate case.

Base PTC Benefits: Calculated as the PTCs related to the Wind Projects that have been included in base rates through a general rate case. This amount is grossed up using the tax gross-up rate from the most recently approved general rate case. Prior to the next general rate case, the Base PTC Benefits amount will be zero. After rates from the general rate case become effective, the Base PTC Benefit will be the amount included in the test period, beginning on the rate effective date. Applicable FERC Account: FERC 409xxxx- Income Taxes, Utility Operating Income

New Capital Investment: The actual monthly electric plant-in-service balances associated with the Combined Projects. Applicable FERC Accounts: FERC 101xxxx - Electric Plant in Service, FERC Sub Accounts: 340xxxx through 347xxxx - Other Production Plant, and 350xxxx through 359xxxx – Transmission Plant

Base Capital Investment: The amount booked into electric plant-in-service related to the Combined Projects that have been included in base rates through a general rate case. After rates from the general rate case become effective, the Base Capital Investment will be the amount included in the test period, beginning on the rate effective date. Applicable FERC Accounts: FERC 101xxxx - Electric Plant in Service, FERC Sub Accounts: 340xxxx through 347xxxx - Other Production Plant and 350xxxx through 359xxxx – Transmission Plant

New Accumulated Depreciation: The monthly accumulated depreciation of the Combined Projects. Applicable FERC Accounts: FERC 108xxxx - Accumulated Depreciation Reserve, FERC Sub Accounts: 340xxxx through 347xxxx - Other Production Plant, and 350xxxx through 359xxxx – Transmission Plant

(continued)

ELECTRIC SERVICE SCHEDULE NO. 97B – Continued

Base Accumulated Depreciation: The amount booked into accumulated depreciation related to the Combined Projects that have been included in base rates through a general rate case. After rates from the general rate case become effective, the Base Accumulated Depreciation Reserve will be the amount included in the test period, beginning on the rate effective date. Applicable FERC Accounts: FERC 108xxxx - Accumulated Depreciation Reserve, FERC Sub Accounts: 340xxxx through 347xxxx - Other Production Plant, and 350xxxx through 359xxxx – Transmission Plant

New Accumulated Deferred Income Tax: The actual accumulated deferred income tax balances associated with the Combined Projects. Applicable FERC Account: FERC 282xxxx - ADIT Other Property

Base Accumulated Deferred Income Tax: The amounts booked into accumulated deferred income tax related to the Combined Projects that have been included in base rates through a general rate case. After rates from the general rate case become effective, the Base Accumulated Deferred Income Tax will be the amount included in the test period, beginning on the rate effective date. Applicable FERC Account: FERC 282xxxx - ADIT Other Property

New Operations and Maintenance Expense: The actual operations and maintenance expense incurred associated with the Combined Projects. Applicable FERC Accounts: FERC 546xxxx, 548xxxx through 554xxxx - Other Power Generation, FERC 556xxxx, 557xxxx - Other Power Supply, 560xxx through 573xxxx (excluding 565xxxx) – Transmission Expense

Base Operations and Maintenance Expense: The amount of the operations and maintenance expense associate with the Combined Projects included in base rates, beginning on the rate effective date of the general rate case. Applicable FERC Accounts: FERC 546xxxx, 548xxxx through 554xxxx - Other Power Generation, FERC 556xxxx, 557xxxx - Other Power Supply, 560xxx through 573xxxx (excluding 565xxxx) – Transmission Expense

New Depreciation Expense: The New Capital Investment monthly balances less the Base Capital Investment, multiplied by the current depreciation rates

New Property Tax Expense: Calculated as the New Capital Investment balance as of the beginning of the calendar year less the Base Capital Investment multiplied by the average property tax rate from the last approved general rate case. Applicable FERC Account: FERC 408xxxx - Taxes Other Than Income

New Wyoming Wind Tax Expense: Calculated as the Incremental Generation associated with Wind Projects that are subject to the Wyoming Wind Tax multiplied by the Wyoming Wind tax rate. Applicable FERC Account: FERC 408xxxx - Taxes Other Than Income

(continued)

ELECTRIC SERVICE SCHEDULE NO. 97B – Continued

RTM Rate Adjustment: Rates derived to recover the RTM Deferral allocated to all applicable retail tariff rate schedules and, where appropriate, to the demand and energy rate components within each Schedule based on the applicable allocation factors and cost of service study relationships established in the most recent Commission-approved general rate case. The allocated and classified costs shall then be divided by appropriate billing determinants consistent with those used to calculate the EBA Rate Determination in Schedule 94. The RTM Adjustment shall be applicable during the RTM Rate Effective Period.

CALCULATION OF THE RTM DEFERRAL

The RTM Deferral will be calculated monthly as the sum of the Plant Revenue Requirement Deferral, the RTM NPC Benefit, the RTM Wheeling Revenues and the RTM PTC Benefit. Each deferral component shall be determined as follows:

1. Plant Revenue Requirement Deferral be calculated as:
   A. Sum of the following rate case components, beginning in the first month following the in-service date for each facility, multiplied by the Company's most recently-approved pre-tax weighted average cost of capital:
      i. New Capital Investment less Base Capital Investment
      ii. New Accumulated Depreciation less Base Accumulated Depreciation
      ii. New Accumulated Deferred Income Tax less Base Accumulated Deferred Income Tax
   B. Plus the sum of the following:
      i. New Operations and Maintenance Expense less Base Operations and Maintenance Expense
      ii. New Depreciation Expense
      iii. New Property Tax Expense
      iv. New Wyoming Wind Tax Expense

2. The RTM NPC Savings will represent any incremental NPC savings associated with the Wind Projects that is not captured in the EBA, calculated as follows:

   Incremental Generation = Wind Plant Generation MWh - Base Wind Plant Generation MWh

   NPC Incremental Savings = [Incremental GenerationHLH x (Monthly Market Price HLH - Integration Costs)] + [Incremental GenerationLLH x (Monthly Market Price LLH - Integration Costs)]

   RTM NPC Benefit = NPC Incremental Savings x EBA Sharing Band

(continued)

ELECTRIC SERVICE SCHEDULE NO. 97B – Continued

3. The RTM Wheeling Revenues will be calculated as any incremental third-party wheeling revenues associated with the Transmission Projects that are not included in the EBA or in base rates, as provided for in Schedule 94, Energy Balancing Account.

4. The RTM PTC Benefit will be calculated as the difference between the New PTC Benefit less the Base PTC Benefit. This deferral will continue to be tracked and included in the RTM until PTCs associated with the new wind assets have expired and are no longer included in base rates.

SYMMETRICAL INTEREST: An annual interest rate of 6% simple interest (.50% per month) applied to the monthly balance in the RTM Deferral Account, consistent with the methodology described in the EBA Carrying Charge under Electric Service Schedule 94.

MONTHLY BILL: In addition to the monthly charges contained in the Customer's applicable schedule, all monthly bills shall have the following RTM Rate Adjustment percentage applied to the monthly Power Charge and Energy Charge of the Customer's applicable electric service schedule. The collection of costs related to the RTM from customers paying contract rates shall be governed by the terms of the contract.

Schedule 1	0.00%
Schedule 2	0.00%
Schedule 3	0.00%
Schedule 6	0.00%
Schedule 6A	0.00%
Schedule 6B	0.00%
Schedule 7*	0.00%
Schedule 8	0.00%
Schedule 9	0.00%
Schedule 9A	0.00%
Schedule 10	0.00%
Schedule 11*	0.00%
Schedule 12*	0.00%
Schedule 15 (Traffic and Other Signal Systems)	0.00%
Schedule 15 (Metered Outdoor Nighttime Lighting)	0.00%
Schedule 21	0.00%
Schedule 23	0.00%
Schedule 31	**
Schedule 32	**

* The rate for Schedules 7, 11 and 12 shall be applied to the Charge per Lamp.
** The rate for Schedules 31 and 32 shall be the same as the applicable general service schedule.

(continued)

ELECTRIC SERVICE SCHEDULE NO. 97B – Continued

ELECTRIC SERVICE REGULATIONS: Service under this Schedule will be in accordance with the terms of the Electric Service Agreement between the Customer and the Company. The Electric Service Regulations of the Company on file with and approved by the Public Service Commission of the State of Utah, including future applicable amendments, will be considered as forming a part of and incorporated in said Agreement.

(continued)

CERTIFICATE OF SERVICE

Docket No. 17-035-40

I hereby certify that on this 30th day of June 2017, a true and correct copy of the foregoing was served by electronic mail and overnight delivery to the following:

Utah Office of Consumer Services	
Cheryl Murray Utah Office of Consumer Services 160 East 300 South, 2nd Floor Salt Lake City, UT 84111 cmurray@utah.gov	Robert Moore Assistant Attorney General 500 Heber M. Wells Building 160 East 300 South Salt Lake City, Utah 84111 rmoore@agutah.gov
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Katie Savarin

Katie Savarin
Coordinator, Regulatory Operations