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RE: Wyoming Docket 20000-545-ET-18  
RMCRE 5<sup>th</sup> Set Data Request (1-16)

Please find enclosed Rocky Mountain Power's Responses to RMCRE 5<sup>th</sup> Set Data Requests 5.4-5.7, 5.9-5.10, and 5.13-5.14, and 5.16. Also provided is Attachment RMCRE 5.10-2. Provided on the enclosed Confidential CD are Confidential Attachments RMCRE 5.10-1, 5.13-1, 5.13-2, and 5.14. Confidential information is provided subject to the protective order issued in this proceeding.

If you have any questions, please call me at (307) 632-2677.

Sincerely,

\_\_\_\_\_/s/\_\_\_\_\_  
Stacy Splittstoesser,  
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Enclosures

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### **RMCRE Data Request 5.4**

Please refer to the Rebuttal Testimony of Daniel J. MacNeil, page 9 line 18 to page 10 line 4.

- (a) Does RMP agree that, exclusive of EV2020 projects, the generation resource additions in the 2017 IRP and 2017 IRP Update occur in years where, absent the additions, RMP's FOT transactions would be constrained available front office transactions? If no, please identify non-EV2020 generation resource additions that are made in years where RMP had sufficient available FOTs to meet capacity needs.
- (b) Does RMP agree that, exclusive of EV2020 projects, capacity needs are the primary driver for generation resource additions in the 2017 IRP and 2017 IRP Update? If no, what is the primary driver for generation resource additions?
- (c) Does the GRID model account for seasonal variations in inputs? If yes how? If no, why not?
- (d) Does the GRID model account for the types of resources in the Company's existing portfolio when calculating costs? If yes how? If no why not?
- (e) Does the GRID model account for geographic diversity when calculating costs? If yes how? If no why not?
- (f) Does the GRID model account for resource potential when calculating costs? If yes how? If no why not?
- (g) Is it RMP's position that a full IRP type analysis is necessary to calculate the revenue requirement differences between two portfolios?

### **Response to RMCRE Data Request 5.4**

- (a) No. In 14 of 20 years of the 2017 Integrated Resource Plan (IRP) Update, front office transaction (FOT) purchases are below the summer limit of 1,575 megawatts (MW) when alternative resources are selected. Non Energy Vision 2020 (EV 2020) resource additions in these years include demand-side management (DSM) and Utah Wind, for example. This is similarly true of the 2017 IRP, where 13 of 20 years have resource additions other than FOTs when there are still FOTs available. Non-EV 2020 resource additions in these years include DSM, Goshen Wind and Utah Solar resources. FOTs rarely reach the winter limit.

EV 2020 resources, like all resources, can reduce the need for alternative resources in years other than the year of the addition.

- (b) Capacity needs are the primary driver for all resource additions. The System Optimizer model (SO Model) selects the least-cost portfolio meeting capacity needs and all other modeled system requirements.

(c) Yes. The Generation and Regulation Initiative Decision Tool (GRID) calculates an optimized dispatch of resources to serve load in every hour of each year being studied and incorporates seasonal variations where they exist. The following GRID inputs have specific values for each hour of the year that capture seasonal variations:

- load;
- market prices for electricity;
- wind and solar generation.

Some other examples of GRID inputs that vary by season are:

- thermal unit maximum output;
- market prices for natural gas;
- hydro generation and capacity;
- planned outage schedules.

(d) Yes. GRID includes all of the resources in Company's existing portfolio.

Resources that are not dispatchable, such as small hydro resources, qualifying facilities (QF) of all types, and the Blundell geothermal plant, are represented as fixed generation volumes using the "contract resource" type. Contracts with certain types of optionality, such as minimum and maximum annual take requirements, can also be represented using the contract resource type.

Hydro resources are modeled using the "hydro resource" type in GRID, which uses weekly energy and capacity inputs and has input parameters that shape the generation and reserve capability.

Other dispatchable resources are modeled using the "thermal resource" type in GRID. This includes thermal units as well as wind and solar resources that can be curtailed. The key advantage of the thermal resource type is that it is economically dispatched for each hour within GRID's system balancing algorithm. Inputs for the thermal resource type include:

- maximum / minimum capacity;
- reserve capability, where applicable;
- start-up related constraints, where applicable;
- planned and forced outages and derates. For wind and solar resources, derates are applied specific to each hour of the year so that the available generation is consistent with the expected hourly generation profile.
- heat rates;
- fuel costs.

(e) Yes. GRID inputs contain an hourly generation profile for each wind and solar resource in the Company's portfolio. For resources that were online in the previous calendar year (2017 in the GRID project used in this filing), the hourly generation profile is based on the actual hourly generation in the historical period, with

adjustments so that the total generation in each month is consistent with the normalized expected output. By using historical actual generation, this reasonably captures the geographic diversity of the existing portfolio. In reviews of historical generation, the Company has found that while the average output can vary significantly, the volatility tends not to vary from year-to-year. Because the average output is being normalized and the fact that new resources are only in the most recent data, the use of the most recent historical year is reasonable.

For units that were not online in the previous calendar year, including prospective QFs, the Company develops correlated hourly generation profiles. The correlated hourly generation profile is based on the hourly generation profiles of existing resources selected based on their proximity to the proposed resource. The hourly generation profile for the proposed resource is a blend of the profiles for the existing resources, weighted based on their relative proximity, and adjusted so that the average output is consistent with the expected output of the proposed resource. This same technique is used to create the hourly generation profiles used in the IRP.

GRID also includes a transmission topology with import and export constraints consistent with the Company's rights and IRP assumptions. A resource's impact in GRID is thus dependent on its geographic location.

- (f) The Company assumes that "resource potential" refers to the amount of resources that could be constructed in a given area. With that caveat:

No. GRID has a specified portfolio of resources, and cannot endogenously change that portfolio. Under the Partial Displacement Differential Revenue Requirement (PDDRR) methodology, the IRP preferred portfolio is modeled in GRID, and discrete changes are made to the IRP preferred portfolio to account for signed contracts and potential QFs. The rules for these portfolio changes are the fundamental premise of the PDDRR methodology, intended to act as a reasonable simplification and substitute for the much more intensive process used to develop a preferred portfolio using the IRP models.

- (g) No. However, it is prudent to compare the revenue requirements of portfolios which are equivalent in terms of cost and risk. The IRP models are necessary to make the most accurate assessment of the cost and risk of different portfolios.

Respondent: Randy Baker / Dan MacNeil

Witness: Dan MacNeil

**RMCRE Data Request 5.5**

Please refer to the Rebuttal Testimony of Daniel J. MacNeil, page 12 figure 6.

- (a) If a non-wind resource defers a wind resource, is the capacity contribution of the remaining undelayed wind resources affected? If yes how? If no, why not?

**Response to RMCRE Data Request 5.5**

Referencing the Rebuttal Testimony of Company witness, Daniel J. MacNeil, Figure 6 indicates that portfolios with less wind capacity have a higher average capacity contribution for wind. But, the area under the curve represents the capacity provided at a given level of wind capacity. So the capacity attributable to the first 3,500 megawatts (MW) of wind is the same, whether or not a portfolio contains 3,500 MW or 4,000 MW of wind. Therefore while the average contribution may change, the incremental contribution may not.

The reality is more complicated than Figure 6 implies as the capacity contribution of wind resources is a function of all of the loads and resources in the Company's portfolio, and not just resources of the same type. Ultimately, capacity contribution is a simplification used in the System Optimizer model (SO model) to develop portfolios and may not result in a reliable outcome when viewed in the Planning and Risk (PaR) model. As a result it is difficult to discern how capacity contribution would be impacted by portfolio changes.

Respondent: Dan MacNeil

Witness: Dan MacNeil

**RMCRE Data Request 5.6**

Please refer to the Rebuttal Testimony of Daniel J. MacNeil, page 12 line 9 to page 13 line 4.

- (a) Does RMP agree that QF rates should reflect avoided energy and capacity costs?
- (b) How is the composition of the least cost least risk resource portfolio relevant to the calculation of QF rates?
- (c) Does the preferred portfolio selected in an IRP depend on the rates paid to existing QF resources modeled in the IRP?

**Response to RMCRE Data Request 5.6**

- (a) To the extent qualifying facilities (QF) allow the Company to avoid both energy and capacity, yes.
- (b) Please refer to the Direct Testimony of Company witness, Daniel J. MacNeil, page 5 line 3 to page 7 line 10. As discussed on page 6, avoided costs are calculated by comparing two studies. Inaccurate avoided costs will be produced if one of those studies reflects the least-cost, least-risk outcomes consistent with the integrated resource plan (IRP) preferred portfolio and the other study includes an additional QF and other changes that do not produce least-cost, least-risk outcomes.
- (c) No. QFs are modeled as existing resources regardless of rates paid.

Respondent: Dan MacNeil

Witness: Dan MacNeil

### **RMCRE Data Request 5.7**

Suppose that, as part of an IRP, a resource is selected to meet capacity needs (the “IRP Resource”). Suppose the IRP Resource was timed such that PacifiCorp needed to commit to the resource before the next IRP update. Suppose prior to committing to the IRP Resource a new QF resource removes all of the capacity need for the IRP resource.

- (a) Will the IRP Resource still be acquired? If yes, why?
- (b) Is it necessary to perform a full IRP analysis prior to determining whether to acquire the IRP Resource despite the QF?
- (c) If the IRP Resource is not acquired, has the capacity cost of the acquired resource been avoided?
- (d) If the IRP Resource is not acquired, how can the avoided capacity cost of the IRP Resource be calculated?

### **Response to RMCRE Data Request 5.7**

The Company must first correct a premise of this request. As part of an integrated resource plan (IRP), the Company models proxy resource costs and characteristics reasonably expected to be consistent with what could be acquired or purchased. As a result an “IRP Resource” does not reflect the costs and characteristics of a specific project that can be constructed or procured. While it is intended to be similar to real-world options, such options will be more diverse and specific. Based on the foregoing clarification, the Company responds as follows:

- (a) Possibly. The Company will only acquire a resource (either owned or a non-qualifying facility (QF) power purchase agreement (PPA)) if the specific proposed resource delivers value for customers based on inputs and assumptions at the time the commitment is made. To the extent a new QF resource has been added to the Company’s system since the IRP preferred portfolio was prepared, it would be appropriate to reassess the least-cost, least risk alternatives when evaluating new resource opportunities. It may still be economic in that assessment.
- (b) The Company does not conduct the robust public input process that an IRP entails when evaluating non-QF resources, but the Company does use the IRP models and tools used to develop the IRP preferred portfolio and all of the latest information available, as applicable.
- (c) If a resource is not acquired, the Company will avoid the cost of that resource and will also lose the associated benefits it would have provided.
- (d) The only information that is guaranteed to be available on the capacity cost of IRP resources is the capacity cost assumed in the IRP itself, for instance in the IRP supply-side table. To the extent the Company has received bids for the resource or has information on other alternatives, better information may be available.



20000-545-ET-18 / Rocky Mountain Power  
June 13, 2019  
RMCRE Data Request 5.7

Respondent: Dan MacNeil

Witness: Dan MacNeil

**RMCRE Data Request 5.9**

Please refer to the Rebuttal Testimony of Daniel J. MacNeil table 6.

- (a) Please provide all work papers supporting the calculations in this table. If already provided, please identify the work papers by file name.
- (b) Are the values calculated in solar tracking deferring wind calculated using the same inputs and assumptions from the 2017 IRP?
- (c) Are the values calculated in “like for like” column calculated using the same inputs and assumptions from the 2017 IRP?
- (d) Is it RMP’s position that the ongoing 2019 IRP should inform QF rates and methodologies in this case?

**Response to RMCRE Data Request 5.9**

- (a) Please refer to the work papers accompanying the Rebuttal Testimony of Company witness, Daniel J. MacNeil, specifically file “WY AC MacNeil Rebuttal Testimony Support.xlsx”, tab “Table 6”, and files linked to that file.
- (b) The Company assumes that the request is asking whether the value for solar tracking deferring wind is using the same assumptions as the Company’s proposal in its Direct Testimony in this proceeding, based on assumptions from the 2017 Integrated Resource Plan (IRP) Update. Based on the foregoing assumption, the Company responds as follows:

Other than the change to the deferred resource, the answer is yes.

- (c) The values shown in the “like for like” column are derived from the values in the Company’s Direct Testimony in this proceeding. The only difference is the 10-year levelization starting in 2030.
- (d) The 2019 IRP values are shown to illustrate the risk of a methodology that is reliant upon stale information. The Company is not requesting that 2019 IRP assumptions be used to inform qualifying facility (QF) avoided costs rates and methodologies at this time. The Schedule 38 methodology will automatically incorporate the 2019 IRP once the 2019 IRP has been published.

Respondent: Dan MacNeil

Witness: Dan MacNeil

### **RMCRE Data Request 5.10**

Please refer to the Rebuttal Testimony of Daniel J. MacNeil page 14 line 20 to page 15 line 1.

- (a) Please provide all analyses and studies performed as part of the ongoing 2019 IRP.
- (b) Please provide all inputs and assumptions used in the 2019 IRP.
- (c) Please provide any studies related to coal retirements related to the 2019 IRP.

### **Response to RMCRE Data Request 5.10**

The Company objects to this data request on the grounds that the 2019 Integrated Resource Plan (IRP) is not relevant and is overbroad and unduly burdensome, the Company further objects because much of the requested information on the yet to be filed IRP is public and therefore equally available to RMCRE. The 2019 IRP analysis is ongoing and has not yet been filed with the state commissions. The Company is not requesting that 2019 IRP assumptions be used to inform qualifying facility (QF) avoided costs rates and methodologies at this time, and therefore the non-final 2019 IRP is not relevant to this proceeding. The Schedule 38 methodology will automatically incorporate the 2019 IRP once the 2019 IRP has been published. Notwithstanding the foregoing objections the Company responds as follows:

- (a) The Company objects to this data request on the grounds that the yet to be filed 2019 IRP is not relevant to this proceeding and is overbroad and unduly burdensome, further much of the requested information is public and therefore equally available to RMCRE.
- (b) Applicable to the referenced Rebuttal Testimony of Company witness, Daniel J. MacNeil, page 14, line 20 to page 15, line 1, please refer to PacifiCorp's Supply Side Resource Table provided at the 2019 Integrated Resource Plan (IRP) Public Meeting held on November 1, 2018, which is publicly available and can be accessed by utilizing the following website link:

[http://www.pacificorp.com/content/dam/pacificorp/doc/Energy\\_Sources/Integrated\\_Resource\\_Plan/2019\\_IRP/Table\\_6.1-6.3-TRC\\_for\\_Supply-Side\\_Resource\\_Options\\_19\\_IRP\\_for\\_PDF.pdf](http://www.pacificorp.com/content/dam/pacificorp/doc/Energy_Sources/Integrated_Resource_Plan/2019_IRP/Table_6.1-6.3-TRC_for_Supply-Side_Resource_Options_19_IRP_for_PDF.pdf)

- (c) Please refer to Confidential Attachment RMCRE 5.10-1 and Attachment RMCRE 5.10-2.

Confidential information is provided subject to the protective order issued in this proceeding.

Respondent: Randy Baker

Witness: Dan MacNeil

### **RMCRE Data Request 5.13**

Please refer to the Rebuttal Testimony of Daniel J. MacNeil, page 41 lines 1-9.

- (a) As coal volumes decline, and RMP moves to higher costing tiers, does the marginal cost of coal generation increase or decrease? If it decreases, please provide explanations, work papers or calculations supporting this position.
- (b) If the marginal cost of coal generation increases, are the incremental savings from displacing coal generation higher or lower? If lower, please provide explanations, work papers or calculations supporting this position.
- (c) Please reconcile the response from part a and b above with the referenced testimony, which seems to state that as RMP moves to higher costing tiers as the value of QF energy decreases.
- (d) Please provide RMP's coal price forecast used in the 2011 IRP.

### **Response to RMCRE Data Request 5.13**

- (a) Please refer to the Company's response to REC Data Request 5.5, specifically Confidential Attachment REC 5.5 for details on the Company's forecasted coal costs. As shown on tab "Incremental by volume", incremental costs generally increase as volumes increase. However, as shown in Confidential Attachment RMCRE 5.13-1, incremental costs are generally lower than average costs. As a result, a reduction in volume will result in a higher average cost.

To clarify the referenced testimony, "Because coal cost tiers typically result in the lowest average prices for the highest volumes, declining volumes will drive up average costs".

Note that changes in generation levels also result in changes in heat rates which would also impact the marginal cost of coal generation. Typically, average heat rates decline as output increases, but incremental heat rates increase as output increases. Incremental coal costs are based on annual volumes, while incremental heat rates are based on moment-to-moment generation levels. The Company has not prepared work papers combining these factors.

- (b) A higher marginal cost of coal generation would result in higher savings from backing down coal generation to accommodate qualifying facility (QF) generation.
- (c) In the referenced testimony, line 5 through 7 are referring to changes in average coal costs, consistent with the data Dr. Hellman / Dr. Kaufman (representing the Renewable Energy Coalition (REC)) used to support their proposal. Lines 7 through 9 contrast that change with the impact on incremental costs, which are used in determining avoided costs for QFs.

20000-545-ET-18 / Rocky Mountain Power

June 13, 2019

RMCRE Data Request 5.13

(d) Please refer to Confidential Attachment RMCRE 5.13-2 which provides the coal price forecast utilized in the 2011 Integrated Resource Plan (IRP).

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Respondent: Dan MacNeil / Dan Swan

Witness: Dan MacNeil

20000-545-ET-18 / Rocky Mountain Power

June 13, 2019

RMCRE Data Request 5.14

### **RMCRE Data Request 5.14**

Please refer to the Rebuttal Testimony of Daniel J. MacNeil, page 41 lines 17-21. Does RMP model a range of coal prices in the 2017 IRP? If yes, please provide the range of coal prices. If no, why not?

### **Response to RMCRE Data Request 5.14**

Please refer to Confidential Attachment RMCRE 5.14 which provides the coal prices utilized in the preferred portfolio from the 2017 Integrated Resource Plan (IRP). A range of coal prices is not specifically modeled as coal is under long-term contracts which gives price certainty to the forecast. Captured in the preferred portfolio coal prices are forecasts beyond contract termination and coal unit retirements that are case specific.

Confidential information is provided subject to the protective order issued in this proceeding.

Respondent: Dan Swan

Witness: Dan MacNeil

**RMCRE Data Request 5.16**

Please refer to the Rebuttal Testimony of Daniel J. MacNeil, page 45, lines 13-17.

- (a) Does the PDDRR methodology allow market sales with incremental QF energy to exceed market sales without incremental QF energy?
- (b) Does RMP believe that avoided costs would be more accurate if the PDDRR methodology was modified to prevent market sales with incremental QF energy from exceeding market sales without incremental QF energy?
- (c) All else equal, would customers prefer to have RMP purchase one MWh of QF energy at negative rates and sell the energy at positive rates to a third party, with the realized gain offsetting net power costs, or would customers prefer to have not engaged in the one MWh transaction?

**Response to RMCRE Data Request 5.16**

- (a) Yes.
- (b) The Company assumes limited incremental market sales for long term planning and in its integrated resource plan (IRP). Using an analogous assumption for qualifying facilities (QF) is reasonable, and all else equal, this assumption results in the best estimate of the impact on customer rates that is possible at the present time.

However, the risk associated with the value of incremental market sales is likely higher than that of the other components of avoided costs. Customer indifference reflects a balance of more than just price, as contract length and other terms are also factors. It could be reasonable for customers to bear higher risks associated with pricing if it is balanced by lower risks in other contract elements, such as a shorter contract length. In addition, whether incremental sales should be considered part of the definition of “avoided costs” under statute is primarily a legal question. The Wyoming Public Service Commission (WPSC) has significant discretion to determine QF avoided cost pricing.

- (c) Customers typically prefer the lowest possible net power costs (NPC), but may prefer lower volatility in NPC, hence the Company has a hedging program to reduce the NPC volatility by transacting on a near-term forward basis at liquid market points. A QF power purchase agreement (PPA) which results in additional volume that must be sold in the market would tend to increase volatility, potentially over a long term. As a result, it is not clear what customers would prefer.

Respondent: Dan MacNeil

Witness: Dan MacNeil