CONFIDENTIAL PER PROTECTIVE ORDER IN UTC DOCKET UE-152253

Exhibit No. RTL-11CT
Docket UE-152253
Witness: Rick T. Link

BEFORE THE WASHINGTON
UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, Complainant, v. PACIFIC POWER & LIGHT COMPANY, Respondent.	DOCKET UE-152253

PACIFIC POWER & LIGHT COMPANY

REDACTED REBUTTAL TESTIMONY OF RICK T. LINK

April 2016

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ATTACHED EXHIBITS

Q. Are you the same Rick T. Link who submitted direct testimony in this case on behalf of Pacific Power & Light Company (Pacific Power or Company), a division of PacifiCorp?

A. Yes.

PURPOSE AND SUMMARY OF REBUTTAL TESTIMONY

Q. What is the purpose of your rebuttal testimony?

A. I respond to the testimony filed by Staff of the Washington Utilities and Transportation Commission (Commission) witness Mr. Jeremy B. Twitchell and Sierra Club witness Dr. Jeremy I. Fisher. My rebuttal testimony responds to assertions made by Staff and Sierra Club that Pacific Power acted imprudently when deciding to install selective catalytic reduction systems (SCRs) on Units 3 and 4 of the Jim Bridger generating plant (Jim Bridger Units 3 and 4). Specifically, I respond to the adjustments proposed by Staff and Sierra Club to the Company's Jim Bridger Units 3 and 4 SCR analysis. I also respond to the direct testimony of the Public Counsel Division of the Attorney General's Office (Public Counsel) witness Ms. Donna A. Ramas related to Jim Bridger SCR benefits if the Commission shortens the depreciable life of the Jim Bridger plant to 2025.

Q. Please summarize your rebuttal testimony.

A. My rebuttal testimony identifies significant errors in the calculations and assumptions used by Staff and Sierra Club to identify proposed adjustments that erroneously support claims that converting Jim Bridger Units 3 and 4 to operate as gas-fueled facilities would be lower cost than installing SCRs.

Staff incorrectly calculates corrections and adjustments related to coal costs, natural gas price assumptions, and replacement power costs that purportedly erode benefits of the SCR compliance alternative.[1] Confidential Figure 1 summarizes the impact of Staff's errors, which, in aggregate, incorrectly assign more than [redacted] of cost to the SCR compliance case.

Confidential Figure 1
Impact of Staff Errors

I describe how Staff's comparative coal cost analysis is based on the use of incorrect data that when corrected completely eliminates its proposed [redacted] adjustment to reduce SCR benefits.

I describe how Staff's comparative natural gas price analysis inappropriately compares nominal prices with real prices. When this error is corrected Staff's

[1] Staff incorrectly calculates corrections for these costs and then applies adjustments to the Company's analysis based on how its proposed corrections affect the relationship between nominal levelized natural gas price assumptions and the PVRR(d) between gas conversion and SCR compliance alternatives.

proposed [redacted] adjustment to reduce SCR benefits is completely eliminated. In fact, correcting for this error *adds* [redacted] of SCR benefits when compared to the Company's analysis updated to reflect natural gas prices from the September 2013 official forward price curve (OFPC). Staff also fails to address natural gas price uncertainty in its comparative gas price analysis.

Furthermore, I describe that alternative unit outage assumptions supporting Staff's replacement power cost analysis are fundamentally flawed and that its calculations are incomplete, and therefore, its proposed [redacted] downward adjustment to SCR benefits is not valid.

Sierra Club inappropriately calculates adjustments related to coal costs and natural gas prices. In both instances, Sierra Club uses information that was available after the Company decided to move forward with the Jim Bridger Units 3 and 4 SCRs to calculate adjustments that reduce SCR benefits. Sierra Club mischaracterizes natural gas price forecast assumptions available to the Company in fall 2013, and similar to Staff, ignores natural gas price uncertainty in its comparative natural gas price analysis. Consequently, Sierra Club's proposed natural gas price forecast adjustment, which purportedly reduces SCR benefits by [redacted], is not valid.

Sierra Club uses coal cost assumptions for the Jim Bridger plant that were developed long after the Company decided to proceed with installation of the SCRs. Even if this coal cost forecast had somehow been available to the Company in fall 2013 (which it was not), there are errors in Sierra Club's calculations that cause it to overstate the proposed adjustment reducing SCR benefits of [redacted] by [redacted]

[redacted]. Thus, Sierra Club's coal cost adjustment (when corrected) does not support its conclusion that gas conversion would be lower cost.

I also respond to Staff's claim that the Company did not provide Jim Bridger Units 3 and 4 SCR analysis requested by the Commission in the Company's 2013 Integrated Resource Plan (IRP) Update. I describe the Commission's request for additional analysis in the 2013 IRP Update, the information presented in the Company's 2013 IRP, and how the Company satisfied the Commission's request.

Finally, I respond to comments raised by Staff and Sierra Club related to the Company's analysis under the West Control Area inter-jurisdictional allocation methodology (WCA). This analysis was presented in my direct testimony for illustrative purposes only, but it is nonetheless reasonable. I describe how the WCA analysis uses the same method to allocate the Company's system-wide actual net power cost results to the west control areal for comparison against the cost included in rates as part of the Company's power cost adjustment mechanism.

COAL COSTS

Q. Did Staff review coal cost projections used in the Company's Jim Bridger SCR analysis?

A. Yes. Staff compared the life-of-plant fuel cost forecasts for the Jim Bridger plant used in the Company's SCR analysis with coal cost projections it claims are based on the Bridger Coal Company mine plan finalized in October 2013.[2] Staff asserts that coal costs from what it describes as the 2013 Bridger Coal Company mine plan are [redacted] percent higher than coal costs used in the Company's Jim Bridger SCR analysis

[2] Twitchell, Exh. No. JBT-1CT 34:10-14.

and argues that the Company should have updated its analysis to reflect these updated projections before issuing the Full Notice to Proceed (FNTP) to the engineering, procurement, and construction services (EPC) contractor on December 1, 2013.

Q. Describe how Staff uses its comparative analysis to apply an adjustment to the Company's Jim Bridger SCR analysis.

A. Staff applies coal costs from what it characterizes as the finalized 2013 Bridger Coal Company mine plan to Jim Bridger fuel consumption data taken from the Company's analysis to calculate annual fuel costs. Staff uses these annual coal costs to calculate Jim Bridger fuel costs on a present value basis and concludes that the Company's base case analysis overstates Jim Bridger SCR benefits by [redacted],[3] which it uses to support a [redacted] adjustment to the Company's analysis.[4] Staff notes that its calculation ignores costs associated with supplemental coal obtained from the Black Butte Mine on the basis it would have a negligible impact on its proposed adjustment.[5]

Q. Is Staff's comparative analysis of Bridger coal costs accurate?

A. No. Staff's analysis is fundamentally flawed, rendering its conclusions and proposed adjustment invalid. Staff failed to recognize that its calculated [redacted] percent increase in coal costs is driven by Bridger Coal Company operating costs that were appropriately excluded from the coal cost forecast used in the Company's Jim Bridger SCR analysis.

[3] *Id*., 34:17-18.
[4] *Id*., 9:Figure 1.
[5] *Id*., 35:13-14.

Q. What costs are included in Bridger Coal Company's mine operating costs?

A. Bridger Coal Company's mine operating costs include both cash and accrued expenditures along with the non-cash costs of depreciation, depletion, and amortization.

Q. Did the Bridger Coal Company operating costs used in the Company's Jim Bridger SCR analysis include depreciation, depletion and amortization costs from past investments?

A. No. The Company's Jim Bridger SCR analysis calculates the impact of future compliance scenarios on customers. The Company's analysis excludes depreciation, depletion, and amortization costs from past investments, because these non-cash costs are the same among all future compliance scenarios and, therefore, have no impact on the Jim Bridger SCR analysis.

Q. Does the Company's analysis include the return on and return of Bridger Coal Company's future capital expenditure projections?

A. Yes. Unlike past investments, forecasted capital expenditures are affected by different compliance alternatives. The Company's analysis considers two compliance scenarios. In one scenario, the Company assumes all Jim Bridger units continue operating as coal-fueled assets with installation of SCRs on Jim Bridger Units 3 and 4. Bridger Coal Company future capital cost projections are specifically tailored for this compliance scenario. In the second compliance scenario, the Company assumes Jim Bridger Units 1 and 2 continue operating as coal-fueled assets and Jim Bridger Units 3 and 4 begin operating as gas-fueled assets without installation of SCRs. Again, Bridger Coal Company future capital cost projections are specifically

tailored to this compliance scenario. The revenue requirement associated with forecasted capital expenditures is included in the Company's analysis because forecasted capital expenditures vary between compliance scenarios.

Q. What costs did Staff include when it compared fuel costs from what it characterizes as the finalized 2013 Bridger Coal Company mine plan to costs used in the Company's Jim Bridger SCR analysis?

A. Staff inappropriately compared Bridger Coal Company operating costs including past non-cash operating costs—which include depreciation, depletion, and amortization—to the cash operating costs used in the Company's analysis.

Q. What is the impact of this error in Staff's comparative coal cost analysis?

A. Had Staff performed the appropriate apples-to-apples comparison, it would have found Bridger Coal Company cash operating costs from what it describes as the finalized 2013 Bridger Coal Company mine plan are identical to the cash operating costs used in the Company's Jim Bridger SCR analysis. Correcting for this error completely eliminates Staff's proposed [redacted] upward cost adjustment to the Jim Bridger Units 3 and 4 SCR compliance case.

Q. Please explain why cash operating costs from what Staff characterizes as the finalized 2013 Bridger Coal Company mine plan are the same as cash operating costs used in the Company's analysis.

A. Based on my review of work papers submitted with its testimony, Staff performed its calculations using the same vintage forecast that was used in the Company's analysis. Staff simply used data from this forecast that was not comparable to the data used in the Company's analysis. I do not know why Staff describes the forecast vintage it

used for its calculations as being any different from the forecast used in the Company's analysis.

Q. Did the Company develop a life-of-plant fuel forecast for the Jim Bridger plant using the Bridger Coal Company mine plan that was updated in October 2013?

A. No. As described in the rebuttal testimony of Company witness Mr. Dana Ralston, a Bridger Coal Company mine plan is not the same thing as a life-of-plant fueling plan for the Jim Bridger generation plant. While the Company updated its Bridger Coal Company mine plan in October 2013, the Company did not update its life-of-plant fueling plan for the Jim Bridger plant in October 2013.

Q. What was the most current life-of-plant fuel price forecast for the Jim Bridger plant available to the Company at the time the FNTP was issued to the EPC contractor?

A. The most current life-of-plant fuel price forecast available at that time was the fuel price forecast used in the Company's analysis of the Jim Bridger SCRs.

Q. Did any other party in this proceeding review the coal cost assumptions used in the Company's analysis of the Jim Bridger SCRs?

A. Yes. Sierra Club compares Jim Bridger coal cost assumptions that were used in the Company's SCR analysis with Jim Bridger coal cost assumptions that were used in the Company's 2015 IRP.[6]

Q. Is it appropriate to make this comparison?

A. No. Jim Bridger coal cost assumptions used in the 2015 IRP were not available to the

[6] Fisher, Exh. No. JIF-1CT 14:8-21.

Company before December 1, 2013, when the FNTP was issued to the EPC contractor.

Q. How does Sierra Club justify its use of coal cost forecasts from the 2015 IRP in its comparative analysis of coal cost assumptions used in the Company's Jim Bridger SCR analysis?

A. Sierra Club asserts that given perceived similarities between the Bridger Coal Company mine plan from October 2013 and the Bridger Coal Company mine plan from 2014, which informed the fuel cost forecast used in the 2015 IRP, the 2015 IRP fuel cost is the best representation of what the Company should have used to update its Jim Bridger SCR analysis before the FNTP was issued to the EPC contractor on December 1, 2013.[7]

Q. How do you respond?

A. A mine plan developed for Bridger Coal Company does not translate into a life-of-plant fuel plan for the Jim Bridger plant. Mr. Ralston's testimony describes the key differences between these two plans and explains why Sierra Club's reliance on the 2015 IRP is misplaced.

Q. Aside from the inappropriateness of Sierra Club's comparative coal cost analysis, are the calculations performed by Sierra Club accurate?

A. No. Sierra Club's comparative analysis is incomplete. Sierra Club only considers changes in cash costs when it compares coal cost assumptions used in the Company's Jim Bridger SCR analysis with those used in the 2015 IRP. As I describe in my rebuttal of Staff's coal cost analysis, the Company's analysis includes Bridger Coal

[7] *Id*., 14:8-21, 17:24-26.

Company's cash costs and forecasted capital expenses, because unlike past capital expenditures, future capital expenses vary between Regional Haze compliance alternatives. Sierra Club's analysis is incorrect because it omits the change in Bridger Coal Company's forecasted capital expenses when comparing coal costs used in the Company's SCR analysis with coal costs used in the 2015 IRP.

Q. What is the impact of this error in Sierra Club's analysis?

A. While Bridger Coal Company's cash costs used in the 2015 IRP life-of-plant fuel cost forecast increased relative to cash costs assumed in the Company's Jim Bridger SCR analysis, Bridger Coal Company's future capital expenses are lower relative to the Company's Jim Bridger SCR analysis, as described in Mr. Ralston's testimony. Based on its flawed analysis, Sierra Club adjusts Jim Bridger SCR benefits down by [redacted]. Had Sierra Club performed an accurate comparative coal cost analysis that included future mine capital expenses, the differential in coal costs used in the 2015 IRP—which were not available in fall 2013—and the coal costs used in the Company's analysis, would reduce this adjustment by [redacted] to [redacted]. Sierra Club's coal cost adjustment (when corrected) does not support its conclusion that gas conversion would be lower cost than installation of SCRs on Jim Bridger Units 3 and 4.

NATURAL GAS PRICES

Q. Did the Company evaluate how natural gas price projections, available when the FNTP was issued, affected its base case analysis of the Jim Bridger SCRs?

A. Yes. The Company's analysis of the Jim Bridger SCRs was completed using base case natural gas prices from its September 2012 OFPC, which yields a nominal

levelized price at Opal over the 2016 through 2030 timeframe of $5.72 per mmBtu. The most current OFPC at the time the FNTP was issued on December 1, 2013, was the September 2013 OFPC, which yields a nominal levelized price at Opal of $5.35 per mmBtu over the 2016 through 2030 timeframe. As described in my direct testimony, the Company estimates that the Jim Bridger SCRs remained approximately [redacted] lower cost than the gas conversion alternative when applying natural gas price assumptions from the September 2013 OFPC.

Q. Did Staff review the Company's September 2013 OFPC?

A. Yes. Staff compared the Company's September 2013 OFPC with seven other forward natural gas price curves, including three curves from third-party experts that were available to the Company, three curves used by other utilities in the region, and one curve produced by the United States Department of Energy's Energy Information Administration (EIA).[8]

Q. What did Staff conclude from its review of the Company's September 2013 OFPC?

A. Staff asserts that the Company's September 2013 OFPC was among the highest of the natural gas price curves it reviewed, and concludes that, on a levelized basis, the Company's curve was well above any of the other projections.[9] Staff then asserts that the average levelized price for the seven other projections is [redacted] per mmBtu, below the Company's predicted break-even price of $4.86 per mmBtu.[10]

[8] Twitchell, Exh. No. JBT-1CT 51 Figure 3.
[9] *Id.*, 51:6-52:3.
[10] *Id.*, 52:4-8.

Staff also testifies that the most relevant natural gas price forecasts are the three projections from third-party experts available to the Company when it developed its September 2013 OFPC because the Company should only be held accountable to act on information it had in its possession.[11] Staff calculates the average levelized price from these three forecasts to be [redacted] per mmBtu. Staff claims that two of the three third-party forecasts available to the Company yield levelized prices of [redacted] per mmBtu and [redacted] per mmBtu, noting that both are below the Company's predicted break-even price of $4.86 per mmBtu.[12] Staff concludes that a reasonable board of directors would have recognized these findings as a conspicuous red flag and reacted by revisiting the SCR analysis.

Q. Did Staff apply an adjustment to the Company's analysis based on its review of the Company's September 2013 OFPC?

A. Yes. Staff uses its calculated average levelized price from the three third-party experts of [redacted] per mmBtu to calculate a present value revenue requirement differential (PVRR(d)) between the Jim Bridger SCRs and gas conversion alternatives. Staff asserts that this adds approximately [redacted] of cost to the Jim Bridger SCR alternative.[13]

Q. Is Staff's assessment of third-party expert forecasts available when the Company developed its September 2013 OFPC accurate?

A. No. Staff's assessment of third-party expert forecasts contains computational errors that render its conclusions and proposed adjustment invalid.

[11] *Id*., 52:9-11; Exh. No. RTL-12C (WUTC Staff's Response to Pacific Power's Data Request No. 4).
[12] *Id*., 52:9-20.
[13] *Id*., 53:22.

Q. Please describe the computational errors in Staff's assessment of the Company's September 2013 OFPC.

A. Staff failed to realize that two of the three third-party expert forecasts it used in its comparative analysis were presented in real dollars, and erroneously compared these forecasts to the Company's September 2013 OFPC, which was presented in nominal dollars. Staff also used a forecast from one of these third-party experts that was only available to the Company *after* it developed its September 2013 OFPC.

Q. What is the impact of Staff's error on its calculation of levelized natural gas prices at Opal?

A. Confidential Figure 2 compares the Company's September 2013 OFPC against the three third-party expert forecasts, as incorrectly represented by Staff, alongside a comparison with a corrected representation that shows each forecast in comparable nominal dollars. When corrected, the average nominal levelized price among the three third-party expert forecasts is $[redacted] per mmBtu, not $[redacted] per mmBtu. The corrected average nominal levelized price is [redacted] percent higher than the nominal levelized price calculated using the Company's September 2013 OFPC and [redacted] percent higher than the average levelized price that Staff erroneously calculated from the three third-party expert forecasts.

Confidential Figure 2
Opal Natural Gas Prices from Third-Party Experts ($/mmBtu)

Q. What would Staff's adjustment have been if the correct average nominal levelized natural gas price had been used?

A. Using the correct average nominal levelized price calculated from the three third-party forecasts yields a PVRR(d) showing that the Jim Bridger SCRs are [redacted] lower cost than the gas conversion alternative. Staff's erroneous analysis suggests that applying the average levelized price from among the three third-party expert forecasts, isolated for its other proposed adjustments, yields a PVRR(d) showing gas conversion is [redacted] lower cost than installing SCRs on Jim Bridger Unit 3 and Unit 4. The impact of Staff's error is a [redacted] swing in favor of the Jim Bridger SCRs.

Q. How would Staff's PVRR(d) compare to the Company's analysis derived from the September 2013 OFPC if the correct average levelized natural gas price were used in Staff's calculations?

A. With the error corrected, the PVRR(d) is [redacted] *more* favorable to the Jim Bridger SCRs relative to the Company's analysis derived from the September 2013 OFPC.

Q. Are you suggesting that the Company should have used an average of the third-party expert price forecasts when evaluating the Jim Bridger SCRs?

A. No. I present the corrected analysis above simply to document the significance of Staff's error and to highlight that the corrected PVRR(d) aligns with the Company's analysis showing the Jim Bridger SCRs are lower cost than a gas conversion alternative. The most current OFPC available to the Company at the time the FNTP was issued to the EPC contractor was the September 2013 OFPC. The Company's analysis of Jim Bridger SCR benefits of [redacted] based on its September 2013 OFPC remains accurate and valid.

Q. Did Staff make similar errors when it compared the Company's 2013 OFPC to forward curves produced by the EIA, [redacted]?

A. Yes. Staff presented these data to show that the Company's "peers were recognizing and responding to falling natural gas prices more accurately than was Pacific Power."[14] In response to a data request, Staff admitted that the [redacted], and EIA forecasts were all in real, rather than nominal, dollars.[15] Therefore, those comparisons are also invalid. Staff also admitted that the [redacted] forecast it relied on was actually prepared in May 2015, not fall 2013 as originally represented. Confidential Figure 3 compares the Company's 2013 OFPC to the [redacted], and EIA curves, as incorrectly represented by Staff, alongside a comparison with a corrected representation that shows each forecast in comparable nominal dollars.[16]

[14] *Id*., 53:3-8.
[15] Exh. No. RTL-12C (WUTC Staff's Response to Pacific Power Data Request No. 4).
[16] The conversion from real to nominal dollars assumes a 1.9 percent annual inflation rate.

Confidential Figure 3
Opal Natural Gas Prices from EIA and Regional Utilities ($/mmBtu)

Q. Did any other party in this proceeding suggest that the Company should have used different natural gas price assumptions to update its analysis before the FNTP was issued to the EPC contractor?

A. Yes. Sierra Club uses the December 2013 OFPC to make an adjustment to the Company's analysis.[17] Using the December 2013 OFPC, Sierra Club reduces the Company's base case analysis developed using the September 2012 OFPC showing a [redacted] benefit from the Jim Bridger SCRs by [redacted].[18] This equates to a [redacted] reduction from the Company's analysis showing a [redacted] benefit from the Jim Bridger SCRs when applying the September 2013 OFPC.

Q. Was the December 2013 OFPC completed at the time the FNTP was issued to the EPC contractor?

A. No. The December 2013 OFPC was completed approximately one full month after the FNTP was issued to the EPC contractor. The Company has a long and well-documented history of finalizing its OFPC on the last trading day of each calendar

[17] Fisher, Exh. No. JIF-1CT 25:4-6.
[18] *Id*., 25:4-6.

quarter. The December 2013 OFPC was produced on December 31, 2013. The FNTP was issued to the EPC contractor on December 1, 2013.

Q. Please describe the long-standing process the Company uses to develop its natural gas price curves when producing its quarterly OFPC updates.

A. PacifiCorp's natural gas OFPC is constructed from three components—a forward market component, a blended component, and a fundamentals component. The first 72 months (years one through six) of the natural gas OFPC, beginning with the first full forward month, is based on forward market data consistent with broker quotes and settled forward prices observed on the last trading day of a calendar quarter. The next twelve months (year seven) are a blend of forward market prices and forward period fundamentals-based prices. The blended component is calculated by averaging monthly prices from the prior year and monthly prices from the subsequent forward year. The fundamentals-based component (year eight and beyond) is based upon expert third-party price forecasts.

The Company performs a comparative analysis of expert third-party price forecasts each calendar quarter to ensure that the fundamentals-based forecast aligns with the most current expert forecasts. When performing this comparative analysis, the Company reviews data supporting each third-party forecast, including quarter-on-quarter changes in supply, demand, net imports/exports, and basis differentials, which define price differentials from specific regional natural gas markets relative to Henry Hub. The Company further reviews how these fundamental drivers compare among the third-party forecasts. When choosing a fundamentals-based natural gas price forecast for use in a quarterly OFPC, the Company generally strives to adopt a

moderate long-term projection that represents neither the highest nor the lowest forecast available from third-party experts.

Q. What fundamentals-based long-term natural gas price forecasts were available to the Company during the development of the December 2013 OFPC?

A. PacifiCorp received an updated long-term natural gas price forecast from three different third-party experts after it finalized its September 2013 OFPC—an updated forecast from [redacted] dated October 22, 2013; an updated forecast from [redacted] dated November 20, 2013; and an updated forecast from [redacted] dated December 11, 2013. The [redacted] long-term price forecast for Opal showed a nominal levelized price of $[redacted]/mmBtu over the 2016-2030 timeframe. Over this same forecast period, the [redacted] and [redacted] long-term forecasts for Opal showed a nominal levelized price of $[redacted]/mmBtu and $[redacted]/mmBtu, respectively. Nominal levelized prices for two of these three price forecasts are well above the break-even levelized Opal natural gas price of $4.86/mmBtu.

Q. Could the Company have completed its review of third-party forecasts considered for the December OFPC before the FNTP was issued to the EPC contractor on December 1, 2013?

A. No. The Company did not receive updated natural gas price forecasts from all of the third-party expert forecasters until December 11, 2013. As discussed above, the Company performs a comparative analysis of third-party expert forecasts when choosing a fundamentals-based forecast for use in its quarterly OFPCs and strives to adopt a moderate long-term projection. This comparative analysis was not completed

until December 19, 2013, which in turn was used to support the December OFPC that was finalized on December 31, 2013.

Q. Is Sierra Club's adjustment based on the December 2013 OFPC appropriate?

A. No. The December 2013 OFPC was developed using data that was not available to the Company at the time the FNTP was issued to the EPC contractor and therefore Sierra Club's proposed natural gas price adjustment is not appropriate. The most current OFPC available to the Company at the time the FNTP was issued to the EPC contractor was the September 2013 OFPC. The Company's analysis of Jim Bridger SCR benefits of [redacted] based on its September 2013 OFPC remains accurate and valid.

Q. How do you respond to Sierra Club's representation of short-term market forwards available before December 1, 2013?

A. Sierra Club claims that short-term market forwards available before December 1, 2013, indicated a "rapid change in forward pricing signals."[19] The Company's long-term resource planning decisions are based on long-term price forecasts. While short-term market forwards may have been declining in late 2013, the long-term forecasts were still above the Company's break-even point when it provided the FNTP to the EPC contractor.

Q. Are there other natural gas price considerations parties have neglected to address in their analysis of the Company's natural gas price assumptions?

A. Yes. Staff and Sierra Club focus entirely on base case natural gas price assumptions and how these natural gas price assumptions changed before the Company issued its

[19] *Id*., 28:8-15.

FNTP to the EPC contractor. As evidenced by this robust discussion, long-term natural gas price forecasts are inherently uncertain. Because natural gas price assumptions are uncertain and important in evaluating Regional Haze compliance alternatives for Jim Bridger Units 3 and 4, the Company's analysis considered a range of natural gas price forecasts to inform its decision to install the SCR systems. Both Staff and Sierra Club fail to recognize this uncertainty by focusing their analysis solely on forecasted base case natural gas price assumptions.

Q. What are the implications of ignoring natural gas price uncertainty?

A. An analysis that focuses entirely on base forecasts assumes that either the assumption is not critical to the analysis or that the forecast assumption is known with a high degree of certainty. As documented in my direct testimony, natural gas price assumptions are an important driver to the Jim Bridger Units 3 and 4 SCR analysis. No party contests that natural gas price assumptions are an important factor in the Company's analysis. Sierra Club testifies that "gas prices are highly influential in this analysis" and that the Company "demonstrates in RTL-9C, there is a direct correlation between gas prices and value of the decision to retrofit Bridger 3 & 4."[20] Moreover, no party testifies that future natural gas price projections are certain.

Both Staff and Sierra Club perform flawed analysis recommending adjustments to the Company's analysis as if long-term base case forecasts for natural prices are fixed. In addition to the errors in their analysis, Staff and Sierra Club fail to recognize that even though natural gas price forecasts were falling in 2013, actual natural gas prices will fluctuate from any forecast over time. This narrow mindset

[20] *Id*., 25:8-9 and 11-12.

ignores the fact that the Company informed its decision to install SCRs at Jim Bridger Units 3 and 4 using base case assumptions and scenario analysis, as presented in my direct testimony, which captures uncertainty in natural gas prices and CO_2 prices.

Q. Does Staff object to the Company's methodology to calculate break-even natural gas and CO_2 prices?

A. No. Staff agrees with the Company's methodology, but recommends an adjustment to the results to reflect Staff's claimed "corrections" based on the use of alternative gas price assumptions, coal cost assumptions, unit outage assumptions, and EPC contract costs.[21] Given that Staff's purported corrections are in error, the Company's calculated natural gas break-even point of $4.86 per mmBtu remains the valid benchmark by which to measure the reasonableness of the Company's decision-making. As set forth above, based on what the Company knew or should have known when it provided the FNTP to its EPC contractor, the installation of SCRs is the least-cost option for Regional Haze compliance.

Q. How do you respond to Staff's summary of the SCR decision-making process as it relates to natural gas price projections?

A. Staff summarizes the SCR decision-making process as coming down to "two fundamental questions: how cheap would natural gas have to be to make gas conversion cost effective, and how much will natural gas cost?"[22] As discussed above, the Company's break-even analysis is sound and demonstrates that natural gas will need to be less than $4.86 per mmBtu for gas conversion to be cost effective. Based on the information available to the Company throughout its decision-making

[21] Twitchell, Exh. No. JBT-1CT 24:1-8, 30 Figure 2.
[22] *Id*., 48:7-9.

process, it was reasonable to assume that long-term natural gas prices were more likely to be equal to or higher than $4.86 per mmBtu than to fall below this break-even price level.

Q. Has any party contested the CO_2 price assumptions applied in the Company's Jim Bridger SCR analysis?

A. No.

REPLACEMENT POWER COSTS

Q. Please describe the analysis Staff used to apply a replacement power cost adjustment to the Company's Jim Bridger SCR analysis.

A. Staff testifies that a two-month outage is required for the natural gas conversion and the SCR compliance scenarios.[23] Staff asserts that given differences in timing of these outages, the Company's analysis assigns replacement power costs to the gas conversion case that are not in the SCRs case.[24] Staff notes that while the Company's analysis assumes a spring outage for the SCR case, actual plans scheduled completion of the SCRs during a fall outage.

Q. Please describe the timing of outages assumed in the Company's analysis.

A. The Company's analysis assumes that work needed to complete a gas conversion would require Jim Bridger Unit 3 to be taken offline in January and February 2016 and require Jim Bridger Unit 4 to be taken offline in January and February 2017. For the SCR scenario, the Company's analysis assumes Jim Bridger Unit 3 would be taken offline in April and May 2015 and that Jim Bridger Unit 4 would be taken offline in April and May 2016.

[23] *Id*., 38:20-21.
[24] *Id*., 39:2-4.

Q. Does Staff suggest that the Company should have assumed alternative outage schedules for the gas conversion and SCR cases?

A. Yes. Referencing risk of construction delays that could make Jim Bridger Unit 3 and Unit 4 unavailable for the summer peak load period, Staff testifies that the Company's internal schedule for an SCR-related outage in fall 2015 and 2016 is reasonable.[25] Staff concludes that if a fall outage is appropriate for the SCR case, then a fall outage should be economically optimal for a gas conversion alternative.[26]

Q. How did Staff calculate its proposed adjustments to the Company's analysis based on these alternative outage schedule assumptions?

A. Staff uses information from the Company's analysis to calculate changes in system variable costs between the gas conversion and SCR cases for January and February 2016 to estimate replacement power costs for outage assumptions made for Jim Bridger Unit 3.[27] Staff represents that this calculation is an estimate of the incremental replacement power cost that was inappropriately assigned to the gas conversion scenario on the basis that the Jim Bridger Unit 3 gas conversion outage should have been assumed to occur in fall 2015, not in January and February 2016.

Staff performed a similar calculation using data from December 2016, arguing that had gas conversion been completed at the end of November 2015, replacement power would be needed to offset the loss of low-cost coal-fueled generation from the Jim Bridger plant in December 2015.[28] Staff assumes that its calculations using December 2016 data are representative of costs that would have been incurred in

[25] *Id*., 40:1.
[26] *Id*., 41:1-9.
[27] *Id*., 43:8-45:5.
[28] *Id*., 45:7-22.

December 2015. Staff represents that this calculation partially offsets the incremental replacement power cost it alleges was inappropriately assigned to the gas conversion case in January and February 2016.

Staff extrapolates its replacement power cost calculations for Jim Bridger Unit 3 that were developed using 2016 data to estimate the impact of outage assumptions applied to Jim Bridger Unit 4 in 2017. In extrapolating its calculations to capture the impact of outage assumptions for Jim Bridger Unit 4 in 2017, Staff applied a one-year discount rate adjustment and an adjustment to account for differences in capacity factor assumptions between Jim Bridger Units 3 and 4 to its 2016 results.[29]

Q. What does Staff conclude from its replacement power cost analysis?

A. Staff concludes its analysis supports an [redacted] reduction to SCR benefits in the low natural gas price scenario, a [redacted] reduction to SCR benefits in the base natural gas price scenario, and a [redacted] reduction to SCR benefits in the high natural gas price scenario.[30] Using these data, Staff applies a [redacted] downward adjustment to SCR benefits.[31]

Q. Is Staff's assessment of the Company's outage assumptions and resulting adjustment calculations valid?

A. No. Staff's outage scenario assumptions are fundamentally flawed and its analysis is not valid. The Company's outage assumptions are tied to Regional Haze compliance deadlines, requiring compliance by the end of 2015 for Jim Bridger Unit 3 and the

[29] *Id*., 45:19-22.
[30] *Id*., 43:17-19.
[31] *Id*., 9: Figure 1.

end of 2016 for Jim Bridger Unit 4. Given the low operating cost of a coal-fueled generating asset relative to a natural gas-fueled generating asset, the Company appropriately assumes the gas conversion outage would not be scheduled until after the compliance deadline has passed for both Jim Bridger Units 3 and 4.

Staff suggests that it is more appropriate to schedule a gas conversion outage beginning in September—four months before the Regional Haze compliance deadline.[32] At the end of an assumed two-month outage, the unit would be available to operate beginning in December before the Regional Haze compliance deadline; however, its variable operating costs would be considerably higher if the unit is fueled by natural gas. Staff recognizes that there is a cost differential between coal-fueled operation and gas-fueled operation, as evidenced by its offsetting adjustment that accounts for lost coal-fueled generation in the month of December. However, Staff's analysis is incomplete. Staff does not apply a similar offset in its analysis for its proposed fall outage months, failing to recognize that if its outage assumptions were applied, the low-cost coal-fueled unit would also be offline from September through November when down for maintenance.

Q. How else is Staff's replacement power cost analysis inaccurate?

A. Staff's calculations compare how system costs vary between the gas conversion and SCR cases in January and February 2016. Over these two months, Jim Bridger Unit 3 is not operating in the gas conversion case because it is assumed to be down for maintenance and operating as a coal-fueled asset in the SCR case. To calculate the impact of moving the gas conversion outage to the fall in the prior year, the correct

[32] *Id*., 42:3-5.

comparison for January and February 2016 would be to evaluate changes in system costs between a case where the unit is off-line and a case where the unit was operating as a gas-fueled asset—not a coal-fueled asset. Jim Bridger Unit 3 would not likely dispatch as a gas-fueled asset in January and February due to its higher operating costs relative to market. In fact, the Company's analysis projects that as a gas-fueled asset, Jim Bridger Units 3 and 4 would operate as peaking assets, dispatching primarily, if not exclusively, during the summer. If Jim Bridger Unit 3 were not dispatched as a gas-fueled asset in January and February, then there would be no difference between the gas-fueled case and the case where the unit is assumed to be offline for maintenance in January and February. This would eliminate all of the replacement power differential erroneously assumed by Staff.

Q. What do you conclude from Staff's replacement power cost analysis?

A. Had Staff made the appropriate comparison and appropriately accounted for two months of incremental offsets to its recommended adjustment, it would find it is not economically optimal to schedule a gas conversion outage that would remove a low-cost coal-fueled generating asset from the system several months before the Regional Haze compliance deadline.

EPC COSTS

Q. Did parties recommend other adjustments to the Company's Jim Bridger SCR analysis?

A. Yes. Staff applies a [redacted] cost to the gas conversion scenario to account for EPC costs had the Company chosen not to issue the FNTP.[33]

[33] *Id*., 47:10-13.

Q. Is Staff's EPC cost adjustment appropriate?

A. No. Staff's EPC cost adjustment is not valid because Staff's overall review of the Company's Jim Bridger SCR analysis is riddled with errors. As described throughout my rebuttal testimony, when these errors are corrected, Staff's conclusion that the Company was imprudent in its decision to install SCRs on Jim Bridger Units 3 and 4 is not supported. Consequently, it is not appropriate to apply an incremental cost to the gas conversion scenario that is intended to account for costs that would have been incurred had the Company chosen not to issue the FNTP to the EPC contractor. The Company's decision to issue the FNTP was prudent.

Q. Did the Company have updated information about the EPC costs before the FNTP was issued?

A. Yes. As described in the rebuttal testimony of Mr. Chad A. Teply, by the December 2013 timeframe, when the Company issued its FNTP to the EPC contractor, the Company was aware that its share of the EPC cost was reduced by approximately [redacted]. When issuing the FNTP, the Company was aware that reduced EPC costs would partially offset falling natural gas prices, while recognizing that there was uncertainty in how future natural gas prices might compare to then-current forecasts.

IRP ANALYSIS

Q. How did Staff summarize the Company's Jim Bridger analysis as presented in the 2013 IRP?

A. Staff explains that the Company originally prepared SCR analysis in 2012 and then updated that analysis twice in 2013—a "major" update using the September 2012

OFPC and a "minor" update for the cost assumptions in the 2013 IRP.[34] Staff states that the SCR analysis included in the 2013 IRP was the first version of the Jim Bridger SCR analysis that was made available to the Commission when the 2013 IRP was filed in April 2013.[35]

Q. Is Staff's characterization accurate?

A. Not entirely. Contrary to Staff's implication, the full SCR analysis developed in 2012 using the September 2012 OFPC was included in the 2013 IRP. The analysis that Staff describes as the Company's 2012 analysis is the same analysis presented in my direct testimony.

Q. Did the Commission request an update on the Company's Jim Bridger SCR analysis in the 2013 IRP Update?

A. Yes. As noted by Staff, the Commission requested an analysis that identifies a natural gas price level and specific emission standards that would make natural gas conversion cost effective.[36] In its discussion of emission standards, the Commission references a Presidential Memorandum released June 25, 2013, directing the U.S. Environmental Protection Agency (EPA) to issue proposed standards, regulations, or guidelines that address carbon pollution from existing power plants by June 1, 2014.[37] The Commission suggested that the Company should develop various price curves for carbon regulation representing a range of what EPA could impose.

[34] *Id.*, 18:13-15
[35] *Id.*, 20:10-13.
[36] PacifiCorp's 2013 Integrated Resource Plan Acknowledgment Letter, Attachment at 3 (Nov. 25, 2013).
[37] *Id.*

Q. Did the Company include in its 2013 IRP Update an analysis showing natural gas price levels at which natural gas conversion would be cost effective?

A. Yes. As I mention above, the Company presented the results of the analysis presented in my direct testimony as part of the 2013 IRP, showing PVRR(d) results among a range of natural gas price assumptions. The Company expanded its presentation of these results in the 2013 IRP Update that identified break-even natural gas price levels. This same analysis is described in my direct testimony and the same relationship between natural gas price assumptions and PVRR(d) results presented in the 2013 IRP Update is documented in Exhibit No. RTL-9C to my direct testimony.

Q. Did the Company include in its 2013 IRP Update an analysis showing how different price curves for carbon regulation affect the economics of Regional Haze compliance alternatives for Jim Bridger Units 3 and 4?

A. Yes. As was done for natural gas prices, the Company expanded its presentation of CO_2 price scenario analysis filed with the 2013 IRP in the 2013 IRP Update to show break-even CO_2 price levels. This same analysis is described in my direct testimony, and the same relationship between CO_2 price assumptions and PVRR(d) results presented in the 2013 IRP Update is documented in Exhibit No. RTL-10C to my direct testimony.

Q. Were the Company's CO_2 price assumptions used in the Jim Bridger SCR analysis reported in the 2013 IRP reasonable when the Company prepared the 2013 IRP Update?

A. Yes. The 2013 IRP Update references the Presidential Memorandum issued June 25, 2013, directing EPA to propose standards, regulations, or guidelines to address

carbon emissions from existing power plants. The Presidential Memorandum laid out a timeline directing EPA to issue the proposed standards, regulations, or guidelines by June 1, 2014, and to finalize them by June 1, 2015. The timeline also directed that state implementation plans are to be completed by June 30, 2016. As reported in the 2013 IRP Update, the Presidential Memorandum did not include any detail on how EPA might approach this directive or what the resulting standards, regulations, or guidelines might require.[38] The Company had no indication and no way of knowing how the directive from the Presidential Memorandum might influence costs for existing coal facilities until the draft rule was issued by EPA in June 2014—*after* the Company issued its FNTP to the EPC contractor in December 2013 and *after* the 2013 IRP Update was filed in March 2014.

Q. Did the Company explain why its CO_2 price assumptions had not changed when it filed the 2013 IRP Update?

A. Yes. The 2013 IRP Update specifically addresses why the Presidential Memorandum did not influence is CO_2 price assumptions. In Chapter 4 of the 2013 IRP Update, the Company explained:

> "Absent information on how EPA intends to proceed with its rule-making process, and without any information on how individual states will propose to implement those regulations through a SIP, there is currently no means to develop a specific CO_2 price assumption that accurately reflects potential CO_2 regulation. PacifiCorp's review of current third-party CO_2 price forecasts shows that despite issuance of the Presidential Memorandum, these forecasters have not materially altered either their assumed CO_2 start date or price level. In the 2013 IRP Update, PacifiCorp continues to assume a CO_2 price signal beginning 2022 at $16/ton escalating at three percent plus inflation thereafter, and expects to update its CO_2 policy assumptions and scenarios in the 2015 IRP,

[38] PacifiCorp 2013 IRP Update, Chapter 2, page 11.

taking into consideration the proposed standard, regulation, or guidelines expected to be issued by EPA later this year."[39]

Q. Did the Company adequately respond to the Commission's request for analysis in the 2013 IRP Update?

A. Yes. Contrary to Staff's claim that the Company's response in the 2013 IRP Update was not acceptable, as discussed above, the Company provided break-even natural gas and CO_2 price analysis as requested by the Commission. The Company further explained why the CO_2 price assumptions used in the analysis that was presented in the 2013 IRP remained valid at the time the 2013 IRP Update was filed.

WCA ANALYSIS

Q. Does the Company suggest its WCA analysis should be used for prudency review?

A. No. As stated in my direct testimony, the Company conducts its resource planning on a total-company basis. Base case results calculated on a WCA-basis were provided for illustrative purposes only.

Q. Staff suggests that the WCA analysis presented by the Company is unreasonable.[40] How do you respond?

A. The Company's WCA analysis starts with optimization of the system as a whole. The costs associated with resources and load obligations that are physically located or electrically connected to the west control are then allocated among west control area customers. The same method is used to allocate the Company's system-wide actual

[39] *Id.*, Chapter 4, page 43.
[40] Twitchell, Exh. No. JBT-1CT 63:16-20.

net power cost results to the WCA for comparison against the cost included in rates as part of the Company's power cost adjustment mechanism.

Q. Staff complains that the Company modeled the west control area as an electrical island. Is the Company's approach consistent with the methodology used to develop retail rates in Washington?

A. Yes. Net power costs in Washington customer rates include only the costs and benefits associated with resources and requirements under the WCA. West control area customers do not pay for generation resources in the east control area, and thus do not receive any benefits from dispatch of those resources to displace more expensive west control area resources or west control are market purchases. Similarly, west control area customers do not pay for transmission access to market hubs in the east control area and thus do not receive benefits associated with making lower cost purchases if available in these markets.

Q. Has the Company provided evidence that the west control area receives benefits from surplus generation on the east side?

A. Yes. The system-wide optimization results in west control area resources (generation plus purchases) that are less than west control area requirements (retail load plus wholesale sales). All electrical systems must be balanced to maintain reliable operation. The system-wide results are balanced, and resources are included in either the west or on the east side. As a result, any shortfall in the west control area must be supplied by surplus resources in the east control area. Because the system-wide results reflect optimized resource dispatch, it is beneficial to the system as a whole to

use east-side resources rather than west-side resources, and costs would otherwise be higher without those transfers from the east control area.

Q. Is the transmission constraint between the west and east control areas affected by the different Regional Haze compliance options for Jim Bridger Units 3 and 4?

A. Yes. When the Jim Bridger units operate as base load units, as is expected in the SCR case, their output typically uses all or most of the transfer capability to the west control area. If Jim Bridger Units 3 and 4 were converted to natural gas, they would operate as peaking assets and dispatch only in high-priced periods. The reduced capacity factor under gas-fueled operation would free-up transfer capability to the west control area in most hours that can be utilized by other low cost east control area resources.

Q. Does projected dispatch of Jim Bridger Units 3 and 4 only in the summer months under the gas conversion case make sense from a west control area perspective?

A. Yes. Due to heating demand, natural gas prices have seasonal trends and are typically highest in the winter. As a result, gas-fueled generation at Jim Bridger would be more expensive in the winter. Given the assumed heat rate for these units, they are not projected to be economic in the winter relative to forecasted Mid-Columbia on-peak prices from the September 2012 OFPC. Dispatch on a west control area-only basis would not yield dramatically different results.

OTHER ISSUES

Q. Does the shorter depreciable life requested by the Company in this case render the Jim Bridger SCRs uneconomic?

A. No. Referring to the Company's request to shorten the depreciable life for the Jim Bridger plant to 2025, Public Counsel testifies that the Company has not demonstrated whether the Jim Bridger SCRs would be lower cost than gas conversion if the Jim Bridger plant were removed from service at the end of 2025.[41] While a shorter depreciable life reduces the PVRR(d) benefits for the SCR compliance case, even with a 2025 depreciable life, the SCR systems remain the least cost compliance option. Public Counsel incorrectly assumes that the Jim Bridger plant would be removed from rates if the depreciable life is shortened to 2025. However, if the plant continues to operate beyond 2025, it will continue to be included in rates.

The Company calculated the impact of a shortened depreciable life in its supplemental response to Public Counsel data requests 15 and 16, and the tab summarizes this analysis included as Confidential Exhibit No. RTL-13C to my rebuttal testimony. This analysis assumes the Jim Bridger plant continues operating beyond 2025 and that projected run-rate operating costs, including run-rate capital costs, beyond 2025 are treated as an expense. With the shortened depreciable life applied to both the gas conversion and SCR compliance scenarios, the Jim Bridger SCRs remain favorable to gas conversion, with a PVRR(d) of [redacted] on a system basis. If the shortened depreciable life is applied only to the SCR compliance

[41] Ramas, Exh. No. DMR-1T Revised (3/29/16) 24:9-25:8.

scenario, then the PVRR(d) benefits of the SCR alternative are [redacted] on a system basis.

Q. Have parties raised any other concerns with the Company's SCR analysis?

A. Yes. Sierra Club argues that the Company's System Optimizer model improperly treats all operating and maintenance costs at Jim Bridger as fixed, which underestimates the variable cost of production and potentially overstates dispatch as the units become increasingly marginal under low gas price forecasts.[42] Sierra Club also contends that the model used to assess the forward market cost of energy appears to assume that three of the four Jim Bridger units retire in 2017.[43]

Q. How do you respond?

A. The Company captures all forecasted fixed and variable run-rate operating costs in its analysis to align its assumptions with the most current plant operating budgets. Non-fuel variable operating costs are a fraction of the fuel costs for a base load coal-fueled operating facility and would not materially alter plant dispatch, even when low natural gas price assumptions are used. Coal unit dispatch is most heavily influenced by fuel costs and assumed CO_2 emission costs, as applicable.

Contrary to Sierra Club's claim, the Company's OFPCs used for its Jim Bridger SCR analysis do not assume an early retirement of three of the four Jim Bridger units at the end of 2017. Sierra Club's reference is an internal Company email provided in response to a Staff's data request seeking all internal emails relating to the preparation of the September 2013 OFPC. The particular email referenced contained output from a model that endogenously determines the amount

[42] Fisher, Exh. No. JIF-1T 41:1-12.
[43] Fisher, Exh. No. JIF-1T 41:13-15.

of renewable resources needed to meet the renewable portfolio standards within the Western Electricity Coordinating Council area. Early retirements for Company-owned resources shown in the file were not used in the Company's forward electricity price forecast.

CONCLUSION

Q. Please summarize your conclusions.

A. In my rebuttal testimony, I identify significant mistakes in the calculations and assumptions used by Staff and Sierra Club to support their claim that converting Jim Bridger Units 3 and 4 to operate as gas-fueled facilities would be lower cost than installing SCRs. The Company's analysis presented in this case is comprehensive, accurate, and supports its decision to install SCR systems on Jim Bridger Units 3 and 4. I demonstrate that:

- Staff incorrectly calculates adjustments related to coal costs, natural gas price assumptions, and replacement power costs that purportedly erode benefits of the SCR compliance alternative.
- Staff's comparative coal cost analysis is based on the use of incorrect data that, when corrected, completely eliminates its proposed [redacted] adjustment to reduce SCR benefits.
- Staff's comparative natural gas price analysis inappropriately compares nominal prices with real prices that, when corrected, eliminate its proposed [redacted] adjustment to SCR benefits. In fact, correcting for this error adds [redacted] of SCR *benefits* when compared to the Company's analysis updated to reflect natural gas prices from the September 2013 OFPC.

- Alternative unit outage assumptions supporting Staff's replacement power cost analysis are fundamentally flawed, the calculations are incomplete and use incorrect data, and therefore, Staff's proposed [redacted] downward adjustment to SCR benefits is not valid.
- Correcting for all errors in Staff's calculations eliminates each of its proposed adjustments that purportedly reduce SCR benefits reported in the Company's analysis.
- Had Staff performed its own analysis accurately, it would have found installation of SCRs on Jim Bridger Units 3 and 4 is [redacted] lower cost than the gas conversion alternative when using base case natural gas price assumptions from the September 2012 OFPC (identical to the Company's analysis).
- Had Staff performed its own analysis accurately, it would have found installation of SCRs on Jim Bridger Units 3 and 4 is [redacted] lower cost than the gas conversion alternative when using third-party expert natural gas forecasts available to the Company in fall 2013.
- Sierra Club inappropriately calculates adjustments related to coal costs and natural gas prices. In both instances, Sierra Club uses information that was available after the Company decided to move forward with the Jim Bridger SCRs to calculate adjustments that reduce SCR benefits.
- Sierra Club mischaracterizes natural gas price forecast assumptions available to the Company in fall 2013.

- Sierra Club's proposed natural gas price forecast adjustment reducing SCR benefits by [redacted] is not valid.
- Sierra Club uses coal cost assumptions for the Jim Bridger plant that were developed long after the Company decided to proceed with installation of SCRs.
- Even if this coal cost forecast were somehow available to the Company in fall 2013, Sierra Club's calculations contain errors that caused it to overstate its proposed adjustment reducing SCR benefits of [redacted] by [redacted].
- If this data were available to the Company when it committed to install SCRs, which it was not, Sierra Club's coal cost adjustment does not support its conclusion that gas conversion would be lower cost than installation of SCR systems.
- Staff and Sierra Club fail to address natural gas price uncertainty in their comparative natural gas price analysis.
- Contrary to Staff's claim, the Company provided information requested by the Commission related to the Jim Bridger SCR analysis in its 2013 IRP Update.
- The Company's WCA analysis is presented for illustrative purposes and is reasonable.

Q. Does this conclude your rebuttal testimony?

A. Yes.