REDACTED
Docket No. 20000-405-ER-11
Witness: Chad A. Teply

BEFORE THE WYOMING PUBLIC SERVICE COMMISSION

ROCKY MOUNTAIN POWER

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REDACTED Rebuttal Testimony of Chad A. Teply

May 2012

**Q. Are you the same Chad A. Teply who submitted direct testimony in this proceeding on behalf of Rocky Mountain Power ("RMP" or the "Company")?**

A. Yes.

**Q. What is the purpose of your rebuttal testimony in this proceeding?**

A. My testimony rebuts the contentions in Mr. Howard Gebhart's testimony, filed on behalf of the Wyoming Industrial Energy Consumers ("WIEC"), regarding the prudence of individual pollution control projects. The pollution control projects included in this case are required to comply with existing regulations, are the least-cost environmental compliance alternative for our customers, and were appropriately evaluated and defined considering pending coal sulfur quality changes at the Hunter facility.

With respect to the Hunter Unit 2 scrubber project, my testimony rebuts Mr. Gebhart's recommended disallowance of project costs that were previously reviewed and subject to the language of the Stipulation and Agreement in Docket No. 20000-384-ER-10.

**Q. How is your testimony organized?**

A. My testimony is organized as follows:

- Summary of Parties' Concerns and Recommendations
- Need and Basis for the Projects
- Alternatives and Cost Effectiveness
- Summary

**Summary of Parties' Concerns and Recommendations**

**Q. Please summarize Mr. Gebhart's direct testimony regarding the Company's pollution control equipment investments and the errors in his conclusions.**

A. Mr. Gebhart addresses whether the Company's pollution control equipment investments are necessary or appropriate to meet the regulatory requirements of the Clean Air Act. He focuses his concerns primarily on the Company's scrubber (sulfur dioxide ("$SO_2$") control) projects included in the case.

Mr. Gebhart expresses his opinion that the Company has voluntarily offered to install pollution control equipment at its Hunter Units 1 and 2 that would otherwise not have been required by existing regulations; that the appropriate metrics of cost effectiveness have not been applied as part of the Company's decision-making processes; and that costs associated with the Company's Hunter Units 1 and 2 scrubber projects should be disallowed as not being the least-cost environmental compliance alternative. Mr. Gebhart's primary arguments related to Hunter Units 1 and 2 are largely based on his summary of an arbitration award that was entered in February 2011. The Company strongly disagrees with Mr. Gebhart's conclusions.

Mr. Gebhart further argues that the costs associated with these emissions control projects are excessive based on his representation of standard regulatory practice as it pertains to determining cost-effectiveness and estimating emission reductions. Mr. Gebhart comes to the conclusion that the Company has made hindsight arguments regarding the role that coal sulfur content played in the timing of development, evaluation, and permitting of the emissions control projects at its Hunter facility.

Mr. Gebhart's contentions are incorrect and his conclusions should be rejected. Mr. Gebhart has failed to appropriately consider key project specific planning inputs, including coal quality and existing equipment performance limitations, which must be considered when evaluating the cost effectiveness of those projects. He has also mischaracterized the application of a standard regulatory practice regarding agency application of cost-effectiveness criteria, and has misrepresented the underlying requirements of the Section 309 Regional $SO_2$ Milestone and Backstop Trading Program ("Section 309 Program").

**Need and Basis for the Projects**

**Q. Are the pollution control investments presented in this Docket required to comply with existing regulations?**

A. Yes. The pollution control investments presented in this case are required to comply with existing regulations including Regional Haze Rules and the Section 309 Program developed over a number of years in alignment with existing federal regulations and administered in Utah and Wyoming, National Ambient Air Quality Standards, New Source Review requirements, state issued construction and operating permits, and state implementation plans. Exhibit RMP___(CAT-2) attached to my direct testimony provides an overview of existing regulations with which the projects presented in this case will be in compliance.

**Q. Does the Company agree with Mr. Gebhart's assertion that it voluntarily committed to install the Hunter Units 1 and 2 scrubber projects absent an environmental compliance requirement?**

A. No. A key element of the Section 309 Program administered by the state of Utah and discussed by Mr. Gebhart in his direct testimony is ensuring that the milestones identified under the program reflect reductions that would achieve greater reasonable progress than would have otherwise occurred if each Best Available Retrofit Technology ("BART") eligible unit installed BART controls or upgraded existing equipment to achieve BART defined emission rates.

Specific to the Company's Hunter BART-eligible units, during the 1990's and early 2000's, the Western Regional Air Partnership ("WRAP") and the state of Utah established assumptions that units controlling at an 80 percent $SO_2$ removal rate would be required to meet a 90 percent removal rate. At the time the Hunter permit application was submitted in August 2006, the 90 percent removal requirement was formalized to be equivalent to an emission rate of 0.12 lb/mmBtu, and the percent removal requirement was not required as a permit condition.

The table below is provided for reference. It is a complete list of all of the BART-eligible emissions sources within the states of New Mexico, Utah, and Wyoming. The 2005 actual emission rate for each electric generating unit ("EGU") is provided. In addition, the emission rates for each EGU that were used to develop the Section 309 program milestones have been identified.

| New Mexico, Utah & Wyoming BART-eligible Sources and Emission Rates Used in the Development of the SO2 Milestones | | | | | | |
|---|---|---|---|---|---|---|
| | State | Company | Unit Name | 2005 Actual Emission Rate | 2008 SO2 Rate Defined as BART in Development of Milestones lb/MMBtu | 2010 SO2 Rate Defined as BART in Development of Milestones lb/MMBtu |
| 1 | NM | Public Service of NM | San Juan 3 | 0.22 | 0.15 | 0.15 |
| 2 | NM | Public Service of NM | San Juan 4 | 0.21 | 0.15 | 0.15 |
| 3 | UT | PacifiCorp | Hunter 1 | 0.15 | 0.12 | 0.12 |
| 4 | UT | PacifiCorp | Hunter 2 | 0.14 | 0.12 | 0.12 |
| 5 | UT | PacifiCorp | Huntington 1 | 0.15 | 0.12 | 0.12 |
| 6 | UT | PacifiCorp | Huntington 2 | 0.93 | 0.12 | 0.12 |
| 7 | WY | Basin Electric | Laramie River 1 | 0.17 | 0.15 | 0.15 |
| 8 | WY | Basin Electric | Laramie River 2 | 0.17 | 0.15 | 0.15 |
| 9 | WY | PacifiCorp | Dave Johnston 3 | 0.84 | 0.15 | 0.15 |
| 10 | WY | PacifiCorp | Dave Johnston 4 | 0.35 | 0.15 | 0.15 |
| 11 | WY | PacifiCorp | Jim Bridger 1 | 0.33 | 0.15 | 0.15 |
| 12 | WY | PacifiCorp | Jim Bridger 2 | 0.30 | 0.15 | 0.15 |
| 13 | WY | PacifiCorp | Jim Bridger 3 | 0.29 | 0.15 | 0.15 |
| 14 | WY | PacifiCorp | Jim Bridger 4 | 0.18 | 0.15 | 0.15 |
| 15 | WY | PacifiCorp | Naughton 1 | 1.05 | 0.15 | 0.15 |
| 16 | WY | PacifiCorp | Naughton 2 | 1.06 | 0.15 | 0.15 |
| 17 | WY | PacifiCorp | Naughton 3 | 0.45 | 0.21 | 0.15 |
| 18 | WY | PacifiCorp | Wyodak | 0.47 | 0.16 | 0.15 |
| 19 | WY | FMC Corp | Green River Soda Ash Plant | | | |
| 20 | WY | General Chemical | Green River Soda Ash Plant | | | |

**Q. What was the basis for the WRAP and the state of Utah to establish the expectation that units controlling at an 80 percent $SO_2$ removal rate would be required to meet a 90 percent removal rate under the Regional Haze program?**

A. Newer coal-fueled units in Utah (e.g. Hunter Unit 3, Bonanza, and IPP Units 1 and 2) have been required to meet a 90 percent removal efficiency since their construction. As such, the state of Utah's expectation was that BART-eligible units could cost-effectively meet this 90 percent removal requirement. In addition, the expectation was included in the proposed 40 CFR Part 51, "Proposed Guidelines for Best Available Retrofit Technology ("BART") Determinations Under the Regional Haze Regulations" published in the Federal Register July 20, 2001.

**Q. Do the emission rates established in the permits issued by the state of Utah for the Company's Hunter Units 1 and 2 scrubber projects align with the milestone assumptions above?**

A. Yes.

**Q. Considering the Company is the largest operator of BART-eligible EGUs in the states included in the Section 309 Program, is it reasonable to expect that ongoing regional haze milestone demonstrations are reliant on successful implementation of the Company's projects used to establish the milestones?**

A. Yes.

**Q. Referring to your previous table, were there any BART-eligible EGUs that were not required to make reductions?**

A. No. Every BART-eligible EGU in the region, including Hunter Units 1 and 2, was required to make reductions. Maintaining the status quo would not have met the requirements of the regional haze program.

**Q. How often are Section 309 Program milestones reviewed?**

A. Section 309 Program milestones are reviewed annually to confirm compliance with established milestones.

**Q. Through what year has the Section 309 Program established milestones?**

A. 2018.

**Q. Does the fact that the measured results of the Section 309 Program are currently trending favorably against established milestones guarantee future compliance through the remainder of the established milestone period?**

A. No.

**Q. Is the Company obligated to install the pollution controls required by state permits, regardless of whether final U.S. Environmental Protection Agency ("EPA") review and approval of the respective Regional Haze state implementation plans remain pending?**

A. Yes. The state implementation plans, BART permits, approval orders and construction permits issued by the respective state agencies for the pollution control investments presented in this case include independent requirements, enforceable by the laws of the respective states. These requirements are enforceable irrespective of whether the EPA has approved or ever does approve the respective state implementation plans.

**Q. Has the EPA acted upon the state of Utah Regional Haze state implementation plan that includes the Company's Hunter Units 1 and 2 scrubber projects that are recommended for disallowance by Mr. Gebhart?**

A. Yes. The EPA has proposed that the portion of the state of Utah's Regional Haze state implementation plan that includes the Hunter Units 1 and 2 scrubber projects for $SO_2$ control be approved. The EPA's proposed action is currently undergoing public comment.

**Hunter Unit 2 Scrubber**

**Q. What is the primary justification for the Company's Hunter Unit 2 scrubber project?**

A. In support of the Regional Haze program being administered by the state of Utah, and the associated Section 309 Program, the Company completed detailed analyses of the appropriate technology to be applied to this BART-eligible facility to achieve established emissions control objectives. Hunter Unit 2 was previously configured with a wet scrubber with permitted $SO_2$ emission limits of 0.21 pounds per million Btu (or a minimum of 80 percent removal, whichever is more stringent). The Hunter Unit 2 scrubber project included in this case will result in the removal of approximately 9,200 tons of $SO_2$ per year. The project will support the continued operation of this cost effective generation facility, while maintaining compliance with permitted $SO_2$ emissions limits with better than presumptive BART performance and supporting established Section 309 Program milestones. Additional information supporting the post-project cost effectiveness of these units is provided in testimony below.

**Q. When did the Company initially commit to undertake the Hunter Units 1 and 2 scrubber projects?**

A. PacifiCorp initially indicated its commitment to proceed with the Hunter Units 1 and 2 scrubber projects as part of the MEHC acquisition commitments filings that were finalized in March 2006. The first official submittal to the Utah Division of Air Quality regarding the Hunter Units 1 and 2 scrubber projects was provided when the notice of intent to construct the Hunter projects was submitted in August 2006. Anticipated changes in fuel quality were identified in early 2007. This timing allowed the anticipated fuel quality changes to be incorporated into the final scope of the Hunter scrubber projects and to be included in the revised notice of intent to construct the projects which was submitted in May 2007, and the final notice of intent to construct the projects which was submitted in November 2007.

**Q. Does the Company agree with Mr. Gebhart's assertion that the Company's commitments to undertake the Hunter Units 1 and 2 scrubber projects prior to becoming aware of potential coal sulfur content increases was a fatal flaw in decision-making and assessment of project benefits and scope?**

A. No. Major pollution control projects such as those included in this case are extremely complex, multi-year endeavors from conceptualization through permitting and execution. It is not uncommon to adjust project plans to accommodate certain design assumptions and identify additional project constraints during detailed reviews and project execution. To ignore issues of this nature would be imprudent and would not provide the best long-term results for the Company's customers. As discussed above, Section 309 Program milestones incorporated an $SO_2$ emission reduction from each of these units regardless of coal quality.

**Q. Does the Company agree with Mr. Gebhart's assertion that the Company's evaluation of coal quality as part of its project planning is properly characterized as a "recent hindsight claim"?**

A. No. As noted above, the Company became aware of the forecasted coal sulfur content changes for the Hunter facility in early 2007 and prudently, timely, and cost effectively incorporated the appropriate scope of work into final project evaluations and implementation plans.

**Q. Would the Company have been required to reduce its $SO_2$ emissions from its Hunter Units 1 and 2 regardless of whether coal sulfur content was increasing?**

A. Yes. As discussed above, the pollution control investments presented in this case are required to comply with existing regulations including Regional Haze Rules and the Section 309 Program developed in alignment with existing federal regulations and administered in Utah and Wyoming. $SO_2$ emissions reductions at Hunter Units 1 and 2 were required notwithstanding forecasted increases in coal sulfur content.

**Q. Did the Company become aware of potential increases in coal sulfur content from its primary coal supplier for the Hunter facility after negotiations had begun with the state of Utah to establish appropriate $SO_2$ emission limits for the Hunter facility?**

A. Yes. The Company became aware of potential increases in coal sulfur content from its primary coal supplier for the Hunter facility in February 2007.

**Q. Was the Company able to incorporate this new information into its planning processes for the subject Hunter facilities?**

A. Yes. The Company submitted its initial notice of intent application to the Utah Division of Air Quality in August 2006 for pollution control equipment projects at the Hunter plant. The application specifically proposed the installation of low NOx burners on Hunter Units 1, 2, and 3; the replacement of electrostatic precipitators with fabric filter baghouses on Hunter Units 1 and 2; and the upgrade of existing scrubbers to greater than 90 percent removal of $SO_2$. The application also requested Plant-wide Applicability Limits for NOx, $SO_2$, and PM. The notice of intent application for the Hunter plant was revised and resubmitted several times until being submitted in its final form in November 2007, allowing adequate time for detailed project planning and work scope development. The Utah Division of Air Quality issued its Approval Order for the Hunter plant pollution control projects in March 2008.

**Q. Does the Company agree with Mr. Gebhart's assertion that fair evaluation of the Company's Hunter Units 1 and 2 scrubber projects needs to discount the impact of coal sulfur content based simply on the timing of that information becoming available?**

A. No. Mr. Gebhart's assertion in that regard is inappropriate and not logically supported.

**Q. What are the phases of work scope associated with the Hunter Unit 2 scrubber project?**

A. As further described in my pre-filed direct testimony, there are three primary phases of the Hunter Unit 2 scrubber project; namely:

(1) scrubber vessel, recycle pumps, and reagent injection system upgrades intended to improve $SO_2$ removal efficiency within the FGD system;

(2) reagent preparation system replacement intended to increase reagent preparation capacity of the system to accommodate increased coal sulfur content and to replace certain end-of-life equipment and components that were no longer operating to original design specifications or otherwise unreliable; and

(3) scrubber waste handling system replacement intended to increase waste handling capacity of the system to accommodate increased coal sulfur content and to replace certain end-of-life equipment and components that were no longer operating to original design specifications or otherwise unreliable.

The balance of work associated with the Hunter Unit 2 scrubber project,

> consisting of closure of the scrubber bypass duct and wet stack conversion activities, was completed under the Hunter Unit 2 baghouse conversion contract due primarily to site work area logistics and construction efficiencies afforded by that approach.

**Q. What capital costs associated with the various phases of the Hunter Unit 2 scrubber project are included in rate base in this case for the first time?**

A. Only the capital costs associated with the reagent preparation system phase of the project being placed in service during the test period are included in rate base in this case for the first time. The capital costs for the Hunter Unit 2 scrubber upgrades phase and scrubber waste handling system phase of the project were previously reviewed by the Commission as part of the Stipulation and Agreement in Wyoming Docket No. 20000-384-ER-10 (the "2010 GRC"). Paragraph 13 of that Stipulation states in part:

> "The Parties agree that the Company's investments and expenses in the forecasted test period associated with environmental projects on the Company's power plants and the Populus to Terminal transmission line should be included in the Company's approved rate base and reflected in rates as prudently incurred investments that are used and useful…"

The capital costs for the Hunter Unit 2 scrubber bypass duct closure and wet stack conversion work scope were also reviewed by the Commission in the 2010 GRC and were also approved as part of the Stipulation and Agreement.

**Q. Has Mr. Gebhart recommended disallowance of pollution control costs for Hunter Unit 2 scrubber project that were subject to the language of the Stipulation and Agreement in the 2010 GRC?**

A. Yes. Regarding the Hunter 2 scrubber project, the Company has requested incremental rate base additions in this case of $12 million of costs associated with the scrubber reagent preparation system. However, Mr. Gebhart's testimony presents an evaluation of the costs, including prior phases of the project, which were subject to the language of the Stipulation and Agreement, with flaws in his evaluation that are discussed herein. Mr. Gebhart recommends disallowance of the project in its entirety, impermissibly including phases of the project which WIEC itself has agreed are prudent and used and useful. The Company objects to the applicability of these analyses to this Docket, disagrees with the conclusions reached, and further objects to Mr. Gebhart's recommended disallowance.

**Q. Does the Company agree that the Hunter Unit 2 arbitration decision referenced in Mr. Gebhart's testimony is generally applicable to this Docket?**

A. No. The Hunter Unit 2 arbitration decision referenced applies only to the question of "Reasonable Utility Practice" as defined in the joint ownership agreement between the Company and Deseret Generation & Transmission Co-operative for the stand-alone Hunter Unit 2 facility. That contractual issue is legally and factually different than the issues in this rate proceeding.

**Q. Does the arbitrator's explanation rely on reasons that are not at issue in this rate case?**

A. Yes. As explained above, the Deseret arbitration award focuses solely on what the arbitrator considered to be the elements of the contractual obligation between two parties and the evidence that did or did not comply with those elements. Also, as explained below, those contractual obligations are different than the standard this Commission must employ in this rate case. For example, the arbitrator's conclusion that PacifiCorp did not meet its contractual obligation to consult with Deseret on the scrubber upgrade has no bearing on the issues before the Commission in this rate case. Likewise, whether PacifiCorp discriminated against Deseret in deciding to install the scrubber upgrade has no application to this rate case. Yet, these were reasons that the arbitrator offered to explain why the scrubber upgrade is not consistent with Reasonable Utility Practice.

**Q. Did the arbitrator consider the impact of the Hunter Unit 2 scrubber upgrade or baghouse conversion on the rates the Company charges in Wyoming?**

A. No. In the arbitration, the issues were very limited and focused solely on whether PacifiCorp's decision to install the baghouse conversion and scrubber upgrade at Hunter 2 is consistent with the joint owners' contractual obligations to each other. It had no bearing on rate setting, which is the exclusive jurisdiction and determination of the utility commissions that regulate the Company.

**Q. In your understanding, how was the issue presented to the arbitrator in the arbitration different from the issue presented to the Commission in this rate case?**

A. As I understand it, the Commission must examine the prudence of investments made by the Company to ensure that the Company's rates are just and reasonable for the retail customers in Wyoming and that the Company's investors are fairly compensated. This typically requires the Commission to consider both long-term and short-term consequences to customers as well as the reasonableness of the Company's actions in relation to its entire system. The arbitrator did not examine these issues. He was limited to looking at whether PacifiCorp fulfilled its contractual obligations to a single joint owner, Deseret. He was not authorized to consider impacts upon customers, and did not consider all of the Company's system, just one generating unit in isolation.

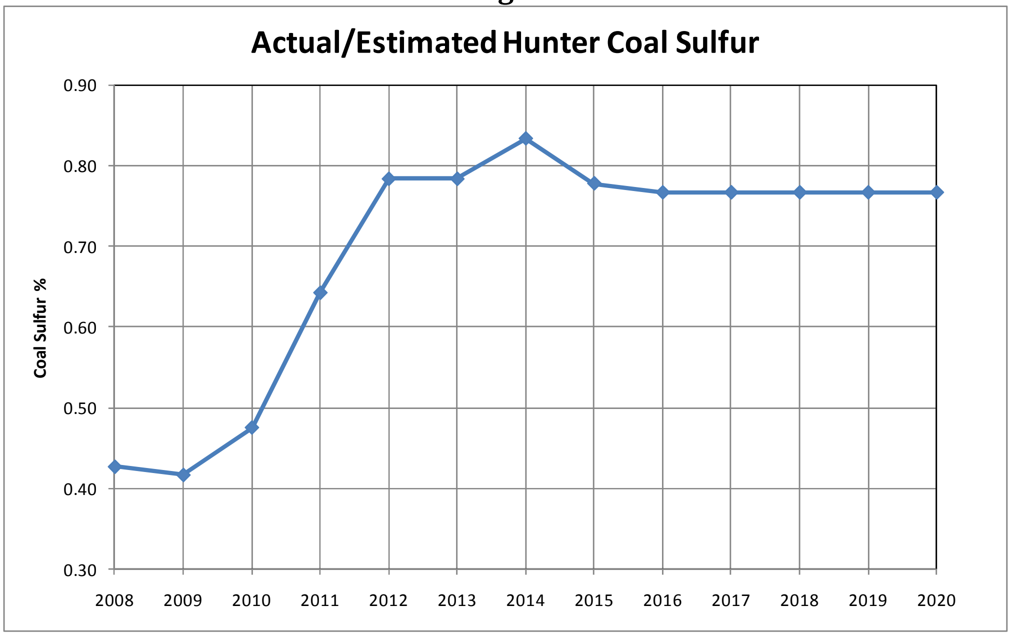
**Q. Does the Company agree with Mr. Gebhart's assertion that the conclusion and reasoning of the arbitration decision regarding Hunter Unit 2 can be extended to Hunter Unit 1?**

A. No.

**Q. How has fuel supply flexibility factored into planning of the Hunter Unit 2 scrubber project?**

A. As the Company developed its final project scoping requirements for the Hunter Units 1 and 2 scrubber projects, the Company became aware of anticipated changes in fuel quality for the Hunter facility that needed to be integrated into the Company's project plans. The fuel quality forecasts received include an increase in coal sulfur content that will exceed the capacities of the existing reagent preparation system and the existing scrubber waste handling system. The following figure provides an overview of the expected coal sulfur content trend.

**Figure 1**



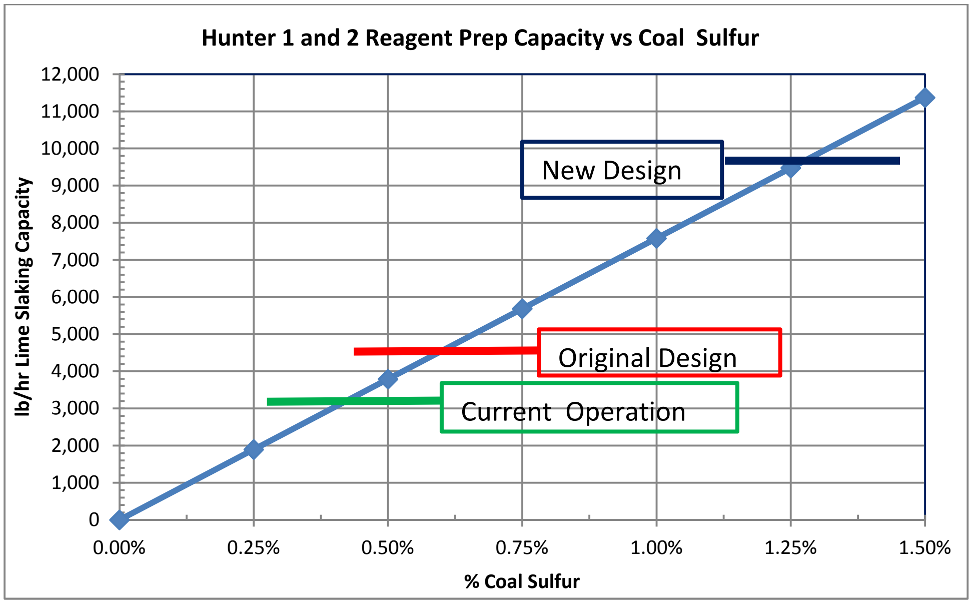

**Q. Did this change in forecasted fuel quality increase the scope and cost of the Hunter Unit 2 scrubber project?**

A. Yes. The scope of the Hunter Unit 2 scrubber project as originally defined and reviewed was primarily limited to scrubber vessel, recycle pumps, and reagent injection system upgrades, as well as wet stack conversion related activities, intended to improve $SO_2$ removal efficiency within the FGD system. The change in forecasted fuel quality is a primary driver for reagent preparation system replacement costs and scrubber waste handling system replacement costs, which are two of the three key phases of the final scrubber project scope of work. The Company's share of project costs associated with those project phases was approximately [redacted] million and approximately [redacted] million, respectively, compared to the Company's share of project costs associated with FGD system efficiency and wet stack conversion related activities of approximately [redacted] million.

**Q. How does the forecasted change in fuel quality impact the scope and cost of the scrubber project subcomponents discussed above?**

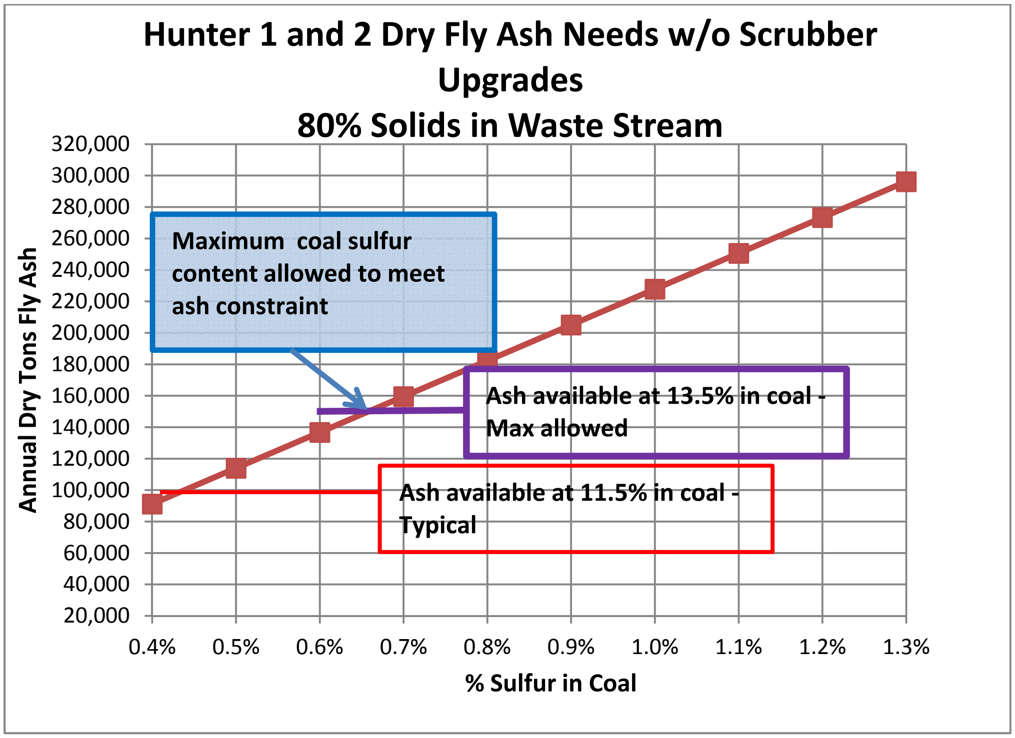
A. Forecasted fuel quality changes result in almost twice the amount of sulfur being introduced into the Hunter units on an annual average basis across the 10-year planning horizon, when compared to historical averages for delivered coal sulfur content. The expectation is that individual coal seams may produce as much as three times the amount of sulfur on a spot basis, when compared to historical averages for delivered coal sulfur content. The ability to produce enough reagent to chemically react with this increased sulfur in the units' flue gas requires larger equipment, upsized infrastructure such as piping and power distribution, and more efficient scrubber performance. Figure 2 below provides a graphical representation of the reagent preparation capacity of the original Hunter scrubbers versus the equipment installed as part of the respective scrubber projects at permitted emissions limits. The new design allows the units to accept and control significantly higher sulfur content in the coal supplied, and supports the ability of the units to receive coal from the various cost competitive mines serving the Company's Utah facilities.

**Figure 2**




The ability to receive and dewater the increased waste streams associated with higher sulfur coal has the same effect on waste handling system capacity requirements. Figure 3 below provides a graphical representation of the limitations of the original scrubber waste handling systems regarding ash and sulfur content of the coal supplied to the units. As shown, at typical coal ash content the original waste handling system capacity was capable of effectively processing coal limited to 0.4 percent to 0.5 percent sulfur, without the need to manage blending via additional measures, which could include sourcing and manually blending off-site fly ash. At maximum coal ash content, the original waste handling system capacity could accommodate up to approximately 0.65 percent sulfur coal. Neither of these scenarios will support projected fuel quality changes for these units. The waste handling system installed as part of the scrubber projects does not rely on fly ash blending, and therefore also accommodates coal from the various cost competitive mines serving the Company's Utah facilities.

**Figure 3**




**Q. Why is the ability to accommodate the forecasted change in fuel quality important?**

A. The ability to fuel the Hunter units using coal with higher sulfur content while meeting new emission limits is fundamental to the Company's ability to maintain competitive fuel and generation costs at this facility.

**Q. How has ongoing compliance with existing operating requirements factored into planning of the Hunter Unit 2 scrubber project?**

A. The Hunter Unit 2 scrubber waste handling system replacement will ensure that the final scrubber waste product will not contain any free liquids and can properly be disposed in the onsite landfill. The discussion pertaining to Figure 3 above provides additional detail in this regard. The Hunter Unit 2 scrubber waste thickener system had reached the end of its useful life and was otherwise unreliable.

**Q. Are operational capabilities afforded by the Hunter Unit 2 scrubber project also expected to support compliance with MATS requirements published in February 2012?**

A. Yes. Based on the MATS emission limits recently finalized, the operational capabilities afforded by the Hunter Unit 2 scrubber project are expected to directly support acid gases emissions compliance under MATS.

**Hunter Unit 1 Scrubber**

**Q. What is the primary justification for Company's Hunter Unit 1 scrubber project?**

A. The primary justification of the Company's Hunter Unit 1 scrubber is the same as that for the Hunter Unit 2 scrubber provided above. Hunter Unit 1 was previously configured with a wet scrubber with permitted $SO_2$ emission limits of 0.21 pounds per million Btu (or a minimum of 80 percent removal, whichever is more stringent). The Hunter Unit 1 scrubber project included in this case will result in the removal of approximately 9,200 tons of $SO_2$ per year. The project will support the continued operation of this cost effective generation facility, while maintaining compliance with permitted $SO_2$ emissions limits with better than presumptive BART performance and supporting established Section 309 Program milestones. Additional information supporting the post-project cost effectiveness of these units is provided in testimony below.

**Q. What are the phases of work scope associated with the Hunter Unit 1 scrubber project?**

A. As further described in my pre-filed direct testimony and consistent with Hunter Unit 2 described above, there are three primary phases of the Hunter Unit 1 scrubber project; namely:

(1) scrubber vessel, recycle pumps, and reagent injection system upgrades intended to improve $SO_2$ removal efficiency within the FGD system;

(2) reagent preparation system replacement intended to increase reagent preparation capacity of the system to accommodate increased coal sulfur content and to replace certain end-of-life equipment and components that were no longer operating to original design specifications or otherwise unreliable; and

(3) scrubber waste handling system replacement intended to increase waste handling capacity of the system to accommodate increased coal sulfur content and to replace certain end-of-life equipment and components that were no longer operating to original design specifications or otherwise unreliable.

The balance of work associated with the Hunter Unit 1 scrubber project, consisting of closure of the scrubber bypass duct and wet stack conversion activities, will be completed in conjunction with the Hunter Unit 1 baghouse conversion project due primarily to site work area logistics and construction efficiencies afforded by that approach.

**Q. Is your previous testimony regarding compliance with existing operating requirements and fuel supply flexibility considerations for the Hunter Unit 2 scrubber project applicable to the Hunter Unit 1 scrubber project as well?**

A. Yes.

**Q. Are capital costs for all three primary phases of the Hunter Unit 1 scrubber project included in this case?**

A. Yes. Capital costs for all three primary phases of the Hunter Unit 1 scrubber project are included in this case. Only capital costs associated with the Hunter Unit 1 scrubber bypass duct closure and wet stack conversion work scope are not included in this case, as that work scope will be completed during the next scheduled major maintenance outage for the unit in 2014.

**Q. What are the capital costs for all three primary phases of the Hunter Unit 1 scrubber project, as well as the estimated capital costs for the scrubber bypass duct closure and wet stack conversion?**

A. The Company's share of project costs for the three primary phases of the Hunter Unit 1 scrubber project is approximately $53 million. The Company's current estimate of capital costs for the scrubber bypass duct closure and wet stack conversion to be completed in 2014 is approximately [redacted] million.

**Q. Are operational capabilities afforded by the Hunter Unit 1 scrubber project also expected to support compliance with the MATS requirements published in February 2012?**

A. Yes. Based on the MATS emission limits recently finalized, the operational capabilities afforded by the Hunter Unit 1 scrubber project are expected to directly support acid gases emissions compliance under MATS.

**Alternatives and Cost Effectiveness**

**Q. Does the Company believe that it has appropriately assessed the cost effectiveness of the pollution control investments contemplated in this case?**

A. Yes. As discussed in my direct testimony, the Company has evaluated cost effectiveness of investing in the emissions control equipment included in this case, including analyses of alternative compliance technologies, retirement and replacement scenarios.

**Q. Does the Company agree with Mr. Gebhart's assertion that standard regulatory practice is that $SO_2$ cost-effectiveness in excess of $2,000 per ton is generally not reasonable, and controls with such costs would not be required by BART?**

A. No. As more thoroughly discussed in the testimony of Company witness Ms. Cathy S. Woollums, the Company does not agree that there is a standard regulatory practice established regarding agency application of a $2,000 per ton cost-effectiveness criteria.

**Q. Does the Company believe that Mr. Gebhart has appropriately assessed the cost effectiveness of the pollution control investments that he recommends for disallowance in this case?**

A. No. In assessing the cost effectiveness of the Hunter Units 1 and 2 scrubber projects that he recommends for disallowance, Mr. Gebhart has failed to appropriately consider key project specific planning inputs, including coal quality and existing equipment performance limitations, which must be considered when evaluating the cost effectiveness of those projects.

**Q. Does the EPA recognize the importance of considering potential fuel quality changes in cost-effectiveness assessments?**

A. Yes. As documented by the EPA in the Federal Register (Vol. 76, No. 55, March 22, 2011, pages 16182-16183) with respect to their review of the state of Oklahoma Regional Haze State Implementation Plan, EPA recognizes the impact that fuel quality has in assessing emission controls and cost effectiveness:

> …Although our TSD [Technical Support Document] provides a detailed comparison between the costing methodologies, a few general points can be made that explain why our costs differ with those from ODEQ. First, in the case of the OG&E analyses, a coal with significantly higher sulfur content than is currently burned was assumed by OG&E's contractor in determining the design of the scrubber. This increased the capital cost of the scrubber over what would minimally be needed to scrub the coal currently being burned. However, the increased tonnage of $SO_2$ that would have been removed from the emissions resulting from the burning of that coal, and the high efficiency of the scrubber was not used in calculating the cost effectiveness ($/ ton). Our cost analysis, assumed the same higher sulfur coal, but adjusted the cost effectiveness to account for the increased scrubber efficiency and the increased tonnage of sulfur that would be removed…

**Q. Did the $SO_2$ reductions identified by the Utah Division of Air Quality, included in Utah's Regional Haze state implementation plan, and referenced as a basis of evaluation by Mr. Gebhart consider impacts associated with forecasted fuel quality changes?**

A. No. The Utah Regional Haze state implementation plan simply took the $SO_2$ emissions from their developed historic baseline and compared them to a projection of future emissions for each unit. This approach does not consider the additional tons of $SO_2$ that must be removed due to increases in coal sulfur content.

**Q. Is it appropriate for Mr. Gebhart to rely on the $SO_2$ emissions control benefits quoted in the Utah Regional Haze state implementation plan as the basis for his cost-effectiveness analyses?**

A. No. The $SO_2$ emissions control benefits referenced in the Utah Regional Haze state implementation plan do not account for fuel quality changes and therefore do not form an appropriate basis for the cost-effectiveness analyses of the Company's Hunter Units 1 and 2 scrubber projects.

**Q. Has the Company assessed the cost effectiveness of the Hunter Units 1 and 2 scrubber projects in light of those key project specific planning inputs.**

A. Yes. The Hunter units are in a unique situation compared to the Company's other units in that: (1) the historic emission rates were driven by an 80% percent removal requirement and not by a specific pounds per million Btu emission rate; (2) the low sulfur fuel being burned historically resulted in low emission rates and typically remained within original equipment design specifications and capacities on an annual average basis; and (3) the sulfur content of the fuel is projected to increase significantly and exceed the capabilities of existing scrubber infrastructure. The various dollar per ton analyses performed by Mr. Gebhart do not appropriately evaluate the tons of $SO_2$ to removed from the flue gas stream and processed by the respective scrubber upgrade projects. While Mr. Gebhart attempts to consider changing coal quality, his assessments do not appropriately consider the performance limitations of existing scrubber system infrastructure or the total tons of $SO_2$ to be removed by the upgraded scrubber systems. To properly identify the additional tons of $SO_2$ removed with the new equipment, the evaluation needs to be based on the changes between historic permit emission rates and new permitted emission rates, as well as the changes in the fuel quality. Examples of this approach are provided in the Table 1 below.

**Q. What are the results of the Company's cost effectiveness analyses?**

A. Table 1 below provides the Company's cost effectiveness analyses for the Hunter Units 1 and 2 scrubber projects for which Mr. Gebhart recommends disallowance. The results of the Company's analyses, incorporating appropriate inputs for changes in fuel quality, further support the cost effectiveness of the scrubber projects in question. More specifically, the cost per ton of $SO_2$ removed is calculated at $1,073 for Hunter Unit 1 and $975 for Hunter Unit 2. Although the Company does not agree that there is a standard regulatory practice established regarding agency application of a $2,000 per ton cost-effectiveness criteria, the Company's assessment of the cost-effectiveness of the Hunter Units 1 and 2 scrubber upgrade projects as presented in Table 1 fall within that criteria.

**Table 1**

| | Hunter 1 | Hunter 2 |
|---|---|---|
| Unit Megawatt Rating, MWn | 430 | 430 |
| Unit Hourly Heat Input, mmBtu/hr | 4,750 | 4,750 |
| Annual Capacity Factor, percent | 90.0% | 90.0% |
| Unit Annual Heat Input, mmBtu/yr @ 90% CF | 37,551,600 | 37,551,600 |
| Baseline Coal Btu/lb | 11,208 | 11,208 |
| Baseline Coal Sulfur, % (historical): | 0.5 | 0.5 |
| Baseline uncontrolled emission rate, lb/mmBtu | 0.892 | 0.892 |
| Annual uncontrolled $SO_2$ emissions, tons/yr | 16,752 | 16,752 |
| $SO_2$ Baseline Emission Rate, lb/mmBtu | 0.16 | 0.16 |
| Baseline Emissions, tons/yr | 3,004 | 3,004 |
| Historic tons SO2 removed | 13,748 | 13,748 |
| Future Coal Btu/lb | 11,425 | 11,425 |
| Future Coal Sulfur, % | 0.767 | 0.767 |
| Future Uncontrolled emission rate (lb/mmBtu) | 1.343 | 1.343 |
| Annual uncontrolled SO2 emissions, tons/yr | 25,210 | 25,210 |
| New Permitted $SO_2$ Rate, lb/mmBtu | 0.12 | 0.12 |
| Future $SO_2$ Emissions, tons/yr | 2,253 | 2,253 |
| Reduction in Future $SO_2$ emissions, tons/yr | 751 | 751 |
| Future tons $SO_2$ removed, tons/yr | 22,957 | 22,957 |
| **Net increase in the tons of $SO_2$ removed, tons/yr** | **9,209** | **9,209** |
| Annual Cost of Control | $9,885,000 | $8,982,000 |
| Dollar per ton estimate based on tons of $SO_2$ removed | $1,073 | $975 |

**Q. Has the Company significantly overstated the amount of $SO_2$ controlled in its cost-effectiveness assessments?**

A. No. Table 1 above appropriately estimates the amount of $SO_2$ controlled by the respective projects, with consideration given to fuel quality changes and total tons of $SO_2$ removed from the flue gas, including the capital costs associated with all phases of the scrubber upgrade projects.

**Q. Mr. Gebhart focuses a significant amount of his testimony disputing the basis on which the Company judges the cost-effectiveness of the pollution control investments included in this case. Is it appropriate only to focus on emissions limit considerations when evaluating the cost-effectiveness of the Hunter Units 1 and 2 scrubber projects?**

A. No. Additional considerations that must be made with respect to the Hunter Units 1 and 2 scrubber projects include more than meeting specific emission limits. Environmental compliance projects for those units must ensure that the emissions control systems can effectively accommodate future fuel quality from the cost competitive coal supply market serving the Company's Utah facilities while also complying with the Company's operating permits and waste disposal obligations. Final project scope development for the projects included in this case also resulted in the replacement of certain end-of-life equipment and components, although those benefits are secondary in nature as compared to the aforementioned fuel quality and operating permit compliance considerations.

**Q. Does the Company agree with Mr. Gebhart's assertion that the state of Utah's administration of its Regional Haze SIP was circumvented by the Company voluntarily offering to install unnecessary emissions control equipment on Hunter Units 1 and 2?**

A. No. The scrubber projects and associated emissions reductions at Hunter Units 1 and 2 were required by the state of Utah as part of its Regional Haze SIP development process. Although the states of Utah and Wyoming took separate approaches to analyzing and determining the requirements of their Regional Haze SIPs, the Company did not voluntarily offer to install environmental upgrades without an underlying requirement.

**Q. Recognizing that the states of Utah and Wyoming took separate approaches to analyzing and determining the requirements of their respective Regional Haze SIPs, has the Company assessed the various cost-effectiveness results that would be realized for the Hunter Units 1 and 2 scrubber projects based on either approach?**

A. Yes. Table 2 provides a summary of the cost-effectiveness results for the projects that are realized by applying the respective methodologies of the Wyoming and Utah environmental agencies, when properly considering future fuel quality impacts. Specifically, the cost per ton of $SO_2$ removed is calculated for Hunter Unit 1 at $1,073 and $1,130, respectively; and for Hunter Unit 2 at $975 and $872, respectively. Again, the Company does not agree that there is a standard regulatory practice established regarding agency application of a $2,000 per ton cost-effectiveness criteria; however, the Company's assessment of the cost-effectiveness of the Hunter Units 1 and 2 scrubber upgrade projects as presented in Table 2 fall within that criteria.

**Table 2**

| COMPARISON OF THE DOLLAR PER TON ESTIMATES CALCULATED USING THE TONS OF SO2 REMOVED RATHER THAN THE TONS OF SO2 EMITTED | Hunter 1 | Hunter 2 |
|---|---|---|
| Annual Cost of Control | $9,885,000 | $8,982,000 |
| Exhibit 36.5 - Change in Tons of $SO_2$ Emitted/Removed Based on Higher Sulfur Coal in Baseline, Tons/yr | 1,690 | 1,690 |
| Exhibit 36.5 - $/ton Calculation Based on the Change in the Tons of SO2 Emitted due to higher sulfur coal | $5,850 | $5,315 |
| Utah SIP - Decrease in Tons of $SO_2$ Emitted, Tons/yr (refer to Table 6, Utah Regional Haze SIP) | 502 | 240 |
| Utah SIP - $/ton Calculation Based on the Change in the Tons of $SO_2$ Emitted | $19,691 | $37,425 |
| Utah SIP - Increase in Tons of $SO_2$ Removed, Tons/yr | 8,749 | 10,299 |
| **Utah SIP - $/ton Calculation Based on the Change in the Tons of $SO_2$ Removed** | **$1,130** | **$872** |
| Wyoming Type Analysis - Decrease in Tons of $SO_2$ Emitted, Tons/yr | 751 | 751 |
| Wyoming Type Analysis - $/ton Calculation Based on the Change in the Tons of $SO_2$ Emitted | $13,162 | $11,960 |
| Wyoming Type Analysis - Increase in Tons of $SO_2$ Removed, Tons/Yr | 9,209 | 9,209 |
| **Wyoming Type Analysis - $/ton Calculation Based on the Change in the Tons of $SO_2$ Removed** | **$1,073** | **$975** |

**Q. Does the Company agree with Mr. Gebhart's assertion that the data presented in his direct testimony accurately reflects the standard regulatory assessment of the cost-effectiveness for the Company's pollution control projects?**

A. No. Mr. Gebhart has failed to appropriately incorporate future fuel quality considerations into his analyses, while, as discussed above, the EPA specifically recognizes the impact that fuel quality has and specifically incorporates that impact in its regulatory assessment of the cost-effectiveness of pollution control projects.

**Summary**

**Q. Please provide a summary of your testimony.**

A. The Company disagrees with Mr. Gebhart's analyses and assertions regarding the necessity and cost effectiveness of the Hunter Units 1 and 2 scrubber projects, both of which he has recommended for disallowance. Mr. Gebhart's analyses of the Hunter units fail to properly consider a fundamental cost-effectiveness assessment criteria; namely future fuel quality.

The Company's emissions control equipment investments included in this case are required to comply with existing regulations, including stand-alone requirements in state implementation plans and permits enforceable by the laws of the respective states, independent of whether EPA has approved the respective state implementation plans. The Company's analyses completed to date demonstrate that maintaining the ability to operate the coal-fueled units included in this case by retrofitting them with the pollution control equipment represents the least-cost option for our customers, while achieving significant environmental improvements. The capital investments are reasonable and prudent, and the Company should be granted full cost recovery for these investments.

**Q. Does this conclude your rebuttal testimony?**

A. Yes.