



Before the South Dakota Public Utilities Commission
State of South Dakota

In the Matter of the Application of Otter Tail Power Company
For Authority to Increase Rates for Electric Utility
Service in South Dakota

Docket No. EL18-___

Exhibit ___

BIG STONE AQCS AND HOOT LAKE MATS CAPITAL PROJECTS

Direct Testimony and Schedules of

KIRK A. PHINNEY

April 20, 2018

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1 **I. INTRODUCTION AND QUALIFICATIONS**

2 Q. PLEASE STATE YOUR NAME AND OCCUPATION.

3 A. My name is Kirk A. Phinney. I am the Manager, Supply Engineering. Part of my duties
4 include being the Project Manager of the Astoria Station for Otter Tail Power Company
5 (OTP).

6
7 Q. PLEASE SUMMARIZE YOUR QUALIFICATIONS AND EXPERIENCE.

8 A. I have a Bachelor of Science Degree in Mechanical Engineering from South Dakota School
9 of Mines and Technology. I have worked in the power generation business for 15 years
10 and for OTP for 12 years. I have experience with coal-fired generation as a plant engineer
11 at Coyote Station and Big Stone Power Plant (Big Stone). I was the Principal Engineer,
12 and later, the Commissioning Manager for the Big Stone Air Quality Control System
13 (AQCS) project. I was also responsible for all close-out activities relating to the Big Stone
14 AQCS project. In my current role at OTP, I provide support to various generation assets
15 within OTP's Energy Supply Department.

16 **II. PURPOSE AND OVERVIEW OF DIRECT TESTIMONY**

17 Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY IN THIS
18 PROCEEDING?

19 A. My Direct Testimony provides information on the project execution and final costs of the
20 Big Stone AQCS and Hoot Lake MATS project. The costs of these projects were approved
21 for recovery by the Commission's December 10, 2014 Order in Docket No. EL14-082,
22 Petition of Otter Tail Power Company to Establish an Environmental Quality Cost
23 Recovery Tariff. I will explain how OTP achieved an approximately 26 percent savings in
24 the construction cost of the Big Stone AQCS project. I will also discuss how OTP
25 completed the Hoot Lake plant (Hoot Lake) Mercury Air Toxins Standard (MATS) project
26 under budget.

27

1 Q. PLEASE PROVIDE A BRIEF OVERVIEW OF YOUR DIRECT TESTIMONY.

2 A. OTP has completed its Big Stone AQCS and Hoot Lake MATS capital projects
3 significantly under budget, resulting in substantial savings for OTP's customers.
4

5 Q. DID YOU USE ANY LABELING CONVENTIONS IN YOUR DIRECT
6 TESTIMONY?

7 A. Yes. There are certain power plant projects where OTP is only a part owner. In those
8 circumstances, I included each of the following: the total project costs, labeled as (Total
9 Plant or Total Project), the OTP ownership allocation of the project amounts, labeled as
10 (OTP Total), and the South Dakota jurisdictional share, labeled as (OTP SD).
11

12 Q. HOW IS YOUR DIRECT TESTIMONY ORGANIZED?

13 A. In Section III, I describe OTP's Big Stone AQCS and Hoot Lake MATS capital projects.
14 In Section IV, I explain how OTP successfully completed these projects substantially under
15 budget. Section V provides my conclusion.

16 **III. BIG STONE AQCS AND HOOT LAKE MATS CAPITAL PROJECTS**

17 Q. PLEASE DESCRIBE THE BIG STONE PLANT.

18 A. Big Stone is a 475 megawatt (MW) coal-fired generation facility located near Milbank,
19 South Dakota. Big Stone is jointly owned by OTP, Montana-Dakota Utilities Co., and
20 NorthWestern Energy. OTP owns 53.9 percent of Big Stone and is the operating agent,
21 which means that the employees at the plant are OTP employees and are subject to OTP
22 management policies and procedures. Significant decisions that impact the plant are
23 approved by co-owner governance. The plant output supplies customers in South Dakota,
24 North Dakota and Minnesota.
25

26 Q. PLEASE DESCRIBE THE HOOT LAKE PLANT.

27 A. Hoot Lake is a 138 MW coal-fired generation facility built in 1959 (Unit 2) and 1964 (Unit
28 3) located near Fergus Falls, Minnesota. Hoot Lake is wholly owned by OTP.
29

1 Q. WHAT IS THE BIG STONE AQCS PROJECT?

2 A. The Big Stone AQCS project refers to the installation of the following equipment at Big
3 Stone: a dry Flue Gas Desulfurization (FGD) system with a new baghouse, an ammonia-
4 based Selective Catalytic Reduction (SCR) system, a Separated Overfire Air (SOFA)
5 system and an Activated Carbon Injection (ACI) system. The purpose of the FGD system
6 and baghouse is to control sulfur dioxide (SO₂) and particulate matter (PM) emissions.
7 The SCR and SOFA technologies are designed to control nitrogen oxide compounds
8 (NO_x) emissions. The ACI system controls mercury.
9

10 Q. WHAT IS THE HOOT LAKE MATS PROJECT?

11 A. The Hoot Lake MATS project involved the upgrade of Electrostatic Precipitators (ESP)
12 and the installation of an ACI system at Hoot Lake. The Hoot Lake MATS project is
13 designed to control mercury and PM emissions at the plant.
14

15 Q. WHY DID OTP UNDERTAKE THESE PROJECTS?

16 A. The Big Stone AQCS project was primarily designed to comply with two separate
17 environmental regulations that needed to be met in order to maintain operation of the Big
18 Stone plant: (1) the South Dakota Department of Environment and Natural Resources'
19 Regional Haze State Implementation Plan (SD Regional Haze SIP); and (2) the
20 Environmental Protection Agency (EPA) Mercury and Air Toxic Standards (MATS) rule
21 (MATS Rule). The Hoot Lake MATS project was designed to comply with the MATS
22 Rule, and without it, OTP would have had to discontinue operating the plant at the end of
23 2015.
24

25 Q. PLEASE BRIEFLY DESCRIBE THE REGIONAL HAZE REGULATIONS.

26 A. The EPA Regional Haze Rule required installation of Best Available Retrofit Technology
27 (BART) at certain power plants, including Big Stone, to control visibility-impairing
28 emissions, such as SO₂, NO_x, and PM. The SD Regional Haze SIP was established to
29 meet the EPA Regional Haze Rule, and required the installation of the following control
30 technologies at Big Stone:

- 1 • Selective Catalytic Reduction with Separated Overfire Air: This technology
2 provides the highest feasible level of control for NOX.
- 3 • Dry Flue Gas Desulfurization: This technology provides the maximum control of
4 SO2 consistent with reducing visibility impact, given the technologies required to
5 control NOX and PM.
- 6 • Baghouse: This technology provides the highest feasible level of control for PM.

7
8 Q. PLEASE BRIEFLY DESCRIBE THE MATS RULE.

9 A. The MATS Rule established emissions standards for new and existing power plants. The
10 MATS Rule focuses on mercury and other hazardous air pollutants.

11
12 Q. DID OTP INSTALL ACI SYSTEMS AT BIG STONE AND HOOT LAKE TO
13 COMPLY WITH THE MATS RULE?

14 A. Yes. The ACI systems at both the Big Stone and Hoot Lake plants help control mercury
15 emissions to comply with the MATS Rule.

16 **IV. CAPITAL PROJECT COST AND IMPLEMENTATION**

17 Q. IS OTP PROPOSING TO INCLUDE THE BIG STONE AQCS PROJECT AND HOOT
18 LAKE MATS PROJECT IN BASE RATES IN THE 2018 GENERAL RATE CASE?

19 A. Yes. The Big Stone AQCS system was put into commercial operation on
20 December 29, 2015 and it is included in base rates for 2017 Test Year used in OTP's 2018
21 general rate case. The Hoot Lake MATS project was placed into commercial operation on
22 August 21, 2014 and is also included in the 2018 general rate case.

23
24 Q. HAS THE COMMISSION REVIEWED THE COSTS FOR THE BIG STONE AQCS
25 PREVIOUSLY?

26 A. Yes. In Docket EL12-027, the Commission Staff and an outside expert reviewed the
27 project. OTP suspended the request for recovery until the project was closer to
28 completion. The Commission approved recovery of the costs for the Big Stone AQCS
29 and Hoot Lake MATS through an environmental quality cost recovery rider (ECRR)

1 tariff in Docket EL14-082. Additionally, the Commission approved the Big Stone AQCS
2 Costs for recovery for Northwestern Energy's general rates in Docket EL14-106. OTP
3 witness Mr. Bryce Haugen discusses the roll-in of the ECRR costs into base rates in his
4 direct testimony.

5 Q. ARE THE BIG STONE AQCS PROJECT COSTS NECESSARY AND
6 REASONABLE?

7 A. Yes. The Big Stone AQCS project is necessary to comply with the EPA Regional Haze
8 Rule, the SD Regional Haze SIP and the MATS Rule. The Commission's staff consultant
9 also determined that the Big Stone AQCS was the least cost option as compared to other
10 alternatives. OTP and the other Big Stone owners undertook significant efforts that resulted
11 in the Big Stone AQCS project coming in substantially under budget. Thus, not only are
12 the Big Stone AQCS project and its costs necessary, the costs are reasonable, and were
13 prudently incurred. OTP witness Mr. Stuart D. Tommerdahl explains that the savings
14 associated with the under-budget completion of the Big Stone AQCS project provide a
15 substantial benefit for OTP customers in South Dakota and other states.

16 **A. Big Stone AQCS Project**

17 Q. IS OTP REQUESTING BASE RATE RECOVERY FOR AQCS PROJECT COSTS?

18 A. Yes. To date, OTP has recovered the eligible cost of the Big Stone AQCS project through
19 its Environmental Quality Cost Recovery Tariff, as approved in Order EL14-082. As noted
20 above, OTP proposes to move these costs from the rider recovery to base rate recovery in
21 this case.

22
23 Q. WHY IS OTP FURTHER EXPLAINING THE COST OF THE BIG STONE AQCS
24 PROJECT IN THIS DOCKET?

25 A. As previously mentioned the Big Stone AQCS project was determined to be the least cost
26 option as compared to other alternatives. As I will explain, the costs for completing the
27 Big Stone AQCS Project were substantially under budget and were reasonable which
28 confirms the Big Stone AQCS was a prudent project.

1 **1. Budgeted AQCS Project Costs**

2 Q. WHAT WAS THE INITIAL BUDGET OF THE AQCS PROJECT?

3 A. The original budget that was presented as part of the Environmental Quality Cost Recovery
4 Tariff Docket (EL14-082) was approximately \$491 million (Total Plant), \$264.6 million
5 (OTP Total), \$24.5 million (OTP SD). However, since the project was in progress at that
6 time, OTP also indicated that the budget had been reduced to \$384 million (Total Plant),
7 \$207.0 million (OTP Total), \$19.1 million (OTP SD).

8
9 Q. HOW WAS THAT ORIGINAL BUDGET DEVELOPED?

10 A. The original budget was based on cost estimates compiled by Sargent & Lundy, a global
11 engineering firm with extensive expertise and experience with electric power generation
12 and power delivery systems.

13
14 Q. WHY WAS SARGENT & LUNDY SELECTED?

15 A. Sargent & Lundy had more experience engineering AQCS systems than any other firm in
16 the country, having worked on 57 percent of the dry FGD projects, 46 percent of the wet
17 FGD projects, and 30 percent of the SCR projects in the industry. Sargent & Lundy also
18 prepared a very detailed and thorough estimate that included budgetary quotes for all of
19 the major procurements. Additionally, Sargent & Lundy compared the AQCS project
20 estimate against similar projects.

21
22 Q. DID OTHER FACTORS ALSO PROVIDE CONFIDENCE IN THE ESTIMATE?

23 A. Yes. OTP's project team also reviewed the virtually identical emission reduction projects
24 installed at Xcel Energy's Allen S. King Plant and Minnesota Power's Boswell Unit 3 and
25 provided input to Sargent & Lundy. The AQCS project was expected to be slightly higher
26 in cost than those projects because of the boiler work that would be required for the Big
27 Stone SCR to operate properly. Even so, after adjusting for plant size and year of
28 completion, the Sargent & Lundy cost estimate for Big Stone was consistent with the costs
29 incurred by these comparable projects.

30

1 Q. HOW HAVE THE ACTUAL COSTS COMPARED TO THE BUDGET?

2 A. The final cost of the AQCS project, including the ACI System, is \$365.5 million (Total
3 Plant), \$197 million (OTP Total), \$18.2 million (OTP SD), or approximately 26 percent
4 below the original budget. I will explain the factors contributing to the project being
5 completed below budget.

6 **2. Management of AQCS Project Costs**

7 Q. HOW DID OTP AND THE OTHER BIG STONE OWNERS MANAGE AQCS
8 PROJECT COSTS AND COMPLETE THE PROJECT BELOW BUDGET?

9 A. There were three primary drivers of bringing the project in under budget: (1) prudent
10 design/engineering modifications; (2) project delivery method, timing and market
11 conditions; and (3) project management.

12

13 Q. PLEASE DISCUSS THE EFFECT OF PRUDENT DESIGN/ENGINEERING
14 MODIFICATIONS.

15 A. Through prudent engineering, there were several changes in the project design and
16 specifications that resulted in considerable cost savings without compromising the
17 performance or operability of the project. For example, changes to the requirements and
18 design of the boiler modifications eliminated major structural changes that were originally
19 contemplated. Another example was the reuse of the Big Stone plant's 13.8 kV switchgear
20 that had been replaced in 2011. Reusing the switchgear eliminated the need for a new plant
21 substation and transformer to feed the Big Stone AQCS project.

22

23 Q. PLEASE DISCUSS THE EFFECT OF PROJECT DELIVERY METHOD, TIMING
24 AND MARKET CONDITIONS.

25 A. The combination of the project delivery method, which was a general work contract target
26 pricing methodology, and a "buyer's market" allowed OTP and the Big Stone owners to
27 take advantage of competitive situations that often yielded bid prices below what we
28 expected. OTP and the Big Stone owners were active in taking advantage of these
29 competitive market conditions to reduce costs.

30

1 Q. HOW DID PROJECT DELIVERY AFFECT THESE SAVINGS?

2 A. OTP selected the project delivery method to allow us to get to the market at the right time,
3 and we aggressively pushed ahead to be in the market during this opportune time.
4

5 Q. CAN YOU PROVIDE EXAMPLES OF PROCUREMENT STRATEGIES THAT
6 HELPED CONTROL COSTS?

7 A. OTP selected Sargent & Lundy as the engineer for the project based on Sargent & Lundy's
8 demonstrated ability to control costs as compared to its competitors. Also, based on a
9 recommendation from Sargent & Lundy, OTP solicited bids from suppliers for each of the
10 AQCS major systems (the FGD, the SCR, and the remaining plant modifications) rather
11 than issue a single engineer-procure-construct solicitation under which a single contractor
12 would complete the entire project. This approach increased the competition in the bidding
13 process and allowed OTP to go to market sooner to take advantage of favorable market
14 conditions. We also contracted with a single construction contractor to efficiently
15 coordinate site work.
16

17 Q. HOW WAS PROJECT MANAGEMENT HANDLED?

18 A. OTP took on the duties of construction management for the project and added people to
19 the project staff to ensure that we could fulfill our obligations. With a project delivery
20 method focused on having a single contractor for the construction of the AQCS equipment,
21 the Big Stone owners felt OTP could take on the construction management of the project
22 rather than using a third party. While this is not the typical approach, OTP and the Big
23 Stone owners believed that it provided the opportunity for significant savings. This
24 decision did in fact lead to substantial savings.
25

26 Q. HOW DID OTP'S CONSTRUCTION MANAGEMENT REDUCE THE COSTS OF
27 THE BIG STONE AQCS PROJECT?

28 A. Management by OTP eliminated the costs of having a third-party manage the construction.
29 A third-party construction manager, even if procured through a competitive bidding
30 process, would necessarily include a premium in its costs to account for the risk of meeting
31 the project deliverables. By deciding that OTP would accept this risk, the risk premium

1 that would have been charged by a third party was essentially removed from the total
2 project costs. Taking on this risk also aligned OTP's goals of completing the project on
3 time and at the lowest achievable cost with the interests of OTP's customers.

4
5 Q. PLEASE DESCRIBE OTP'S SYSTEM TO MANAGE CONTRACTORS.

6 A. There were several key elements to contractor management on the project. The first was
7 the creation of a project execution manual. This manual described the information and
8 process for clear communication on the project. It included definitions around Requests
9 for Information, Fieldwork Authorization, and Non-Conformance Reports. This was a
10 clear communications protocol for everyone on the project team to manage information.

11 Second, there was early discussion of performance indices before contractors
12 mobilized to the site. The performance indices were cost performance index, schedule
13 performance index, labor productivity index, OSHA Rate, lost time rate, etc. Third,
14 regularly scheduled information exchange with the contractors was routine at the site, with
15 daily and weekly coordination meetings and monthly recording meetings.

16
17 Q. WHAT WAS THE FINANCIAL IMPACT OF THE DESIGN MODIFICATIONS,
18 PROJECT DELIVERY, AND PROJECT MANAGEMENT ELEMENTS?

19 A. Table 1 quantifies the total savings of each of these elements.
20

1
2

Table 1

AQCS Project Budget Savings

	<u>Total Savings (Total Plant)</u>	<u>Total Savings (OTP Total)</u>	<u>Total Savings (OTP SD)</u>	<u>Percent of Original Budget</u>
2014 Budget Reduction	\$106,800,000	\$57,565,200	\$5,377,527	21.75%
Final Project Cost	\$18,686,194	\$10,071,859	\$940,876	3.81%
<i>Total Budget Reduction</i>	<i>\$125,486,194</i>	<i>\$67,637,059</i>	<i>\$6,318,403</i>	<i>25.56%</i>
<u>Drivers</u>				<u>Percent of Total Reduction</u>
Design / Engineering Modifications	\$47,471,427	\$25,587,099	\$2,390,252	37.83%
Project Delivery Method/ Market Conditions	\$36,918,038	\$19,898,823	\$1,858,874	29.42%
Project Management	\$13,715,641	\$7,392,731	\$690,602	10.93%
Remainder	\$27,381,088	\$14,758,406	\$1,378,676	21.82%
<i>Total</i>	<i>\$125,486,194</i>	<i>\$67,637,059</i>	<i>\$6,318,403</i>	

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Q. WHAT IS THE OVERALL IMPACT OF THE EFFORTS TO MANAGE THE COSTS OF THE BIG STONE AQCS PROJECT?

A. The final cost of the Big Stone AQCS project is \$365.5 million (Total Plant), \$197 million (OTP Total), \$18.2 million (OTP SD). Through the efforts of OTP and the other Big Stone owners, we were able to reduce the cost of the project by more than \$125.5 million (Total Plant), \$67.6 million (OTP Total), \$6.3 million (OTP SD), or approximately 26 percent below budget.

Q. DO THESE COST REDUCTIONS PROVIDE BENEFITS TO OTP’S SOUTH DAKOTA CUSTOMERS?

A. Yes. As explained by Mr. Tommerdahl, these cost savings will provide significant and long-lasting benefits to OTP’s customers in South Dakota and other states.

1 **3. Timeliness and Safety of Big Stone AQCS Project Implementation**

2 Q. PLEASE SUMMARIZE THE BIG STONE AQCS PROJECT TIMELINE.

3 A. Work began in 2011. Detailed engineering was carried out in 2011 and 2012, with major
4 procurements beginning in the first half of 2012. Actual on-site construction started in
5 March of 2013 and continued through the summer of 2015, with the last construction
6 personnel leaving the site on September 4, 2015. Construction milestones throughout 2014
7 kept the project on schedule. The majority of construction was completed by the spring of
8 2015 when the Big Stone Plant was taken off-line to make needed modifications to the
9 boiler and to tie the new AQCS equipment in to the existing plant.

10 The AQCS equipment was then started up and operated for the first time in August
11 2015. For the next three months, the system was tuned and then tested to insure it was
12 performing as intended. The AQCS system was put into commercial operation on
13 December 29, 2015. Demolition of equipment that was no longer needed occurred in 2016
14 along with closing out of major contracts. The final payments to equipment suppliers were
15 made in October of 2017.

16
17 Q. DID OTP PRIORITIZE SAFETY AS PART OF THE PROJECT IMPLEMENTATION?

18 A. Yes. Safety is a primary concern for every project, but because of the size and complexity
19 of this project, we placed an increased emphasis on safety. For example, project employees
20 were required to complete safety orientation, and were instructed on 10 “Cardinal Rules”
21 of safety with zero tolerance for safety violations. Sub-contractors held daily safety
22 meetings where safety concerns were identified and communicated to the workforce
23 through a Task Safety Analysis.

24 Our contract required a specific safety representative for every 50 workers. During
25 peak construction, we had a workforce of approximately 500 people, and during the tie-in
26 outages we had approximately 650 people working on site. There were over 2.3 million
27 work-hours spent on the project with only one lost time accident.

28 OSHA’s metric for safety performance measures the number of injuries that meet
29 the reporting criteria for each 100 employees working a full year. Our OSHA rate for the
30 entire project has been 0.88. For comparison purposes, in 2014, the overall OSHA rate

1 reported by the Bureau of Labor Statistics for utility construction projects nationwide was
2 2.6.

3
4 Q. DID THE PROJECT STAY ON SCHEDULE?

5 A. Yes, the Big Stone AQCS project stayed on schedule. The start-up and commercial
6 operation of the AQCS equipment was delayed approximately two months, but as
7 discussed below, this adjustment to the commercial operation date was not due to any
8 issues with the Big Stone AQCS project. It was due to an issue with existing equipment at
9 the Big Stone plant that was identified for correction during the scheduled outage during
10 which the AQCS tie-in occurred. Furthermore, the two-month delay did not have a
11 material impact on the cost of the Big Stone AQCS project.

12
13 Q. WHAT CAUSED THE APPROXIMATE TWO-MONTH DELAY IN THE
14 COMMERCIAL OPERATION DATE OF THE AQCS PROJECT?

15 A. The scheduled Big Stone plant outage began on February 27, 2015. During a routine
16 inspection, it was discovered that all ten rows and the control stage blades of the plant's
17 high pressure (HP) turbine needed to be replaced. This issue was unrelated to the Big Stone
18 AQCS project. Replacing the blades extended the outage by approximately two months
19 (June 11 to August 4). It also delayed when we could begin testing the Big Stone AQCS
20 project equipment because testing could only start when the plant was back online.

21
22 Q. WHY DID THE TWO MONTH DELAY NOT HAVE A MATERIAL IMPACT ON
23 COST OF THE PROJECT?

24 A. The most important schedule consideration as it relates to project cost was having the
25 AQCS equipment ready to be tied-in to the existing Big Stone plant infrastructure during
26 a scheduled outage. The two-month delay had no impact on this factor. The tie-in could
27 only occur during a plant outage. Plant outages, which generally occur every three to five
28 years, are planned well in advance of the outage date. When the Big Stone AQCS project
29 timeline was developed, the Big Stone plant was scheduled for an outage in 2015 for non-
30 AQCS scheduled maintenance. Performing the tie-in during the planned 2015 outage
31 allowed us to avoid a second outage.

1 Q. IS THE AQCS EQUIPMENT NOW FULLY FUNCTIONAL AND OPERATING AS
2 EXPECTED?

3 A. Yes. The AQCS equipment was put into commercial operation on December 29, 2015,
4 has achieved the desired emissions reductions necessary to comply with regulations and is
5 performing as expected.

6 **B. Hoot Lake MATS Project**

7 Q. IS OTP REQUESTING BASE RATE RECOVERY FOR THE HOOT LAKE MATS
8 PROJECT COSTS?

9 A. Yes. To date, OTP has recovered the eligible cost of the Hoot Lake MATS project through
10 its Environmental Quality Cost Recovery Tariff, as approved in Order EL14-082. OTP
11 proposes to move these costs from the rider recovery to base rate recovery in this case. Mr.
12 Haugen discusses OTP's proposal to roll the costs of the Hoot Lake MATS project into
13 base rates as part of this case.

14

15 Q. WHAT WAS THE PROPOSED HOOT LAKE MATS PROJECT BUDGET?

16 A. As part of a baseload diversification study the estimated cost of the Hoot Lake MATS
17 project was \$10 million (OTP Total), \$925,000 (OTP SD). After getting firm bids on the
18 project and further project development, the overall projection for the project was \$8.2
19 million (OTP Total), \$758,500 (OTP SD). This is approximately \$1.8 million (OTP Total),
20 \$166,500 (OTP SD) lower than the cost of environmental compliance identified in the
21 baseload diversification study.

22

23 Q. PLEASE DESCRIBE THE PROCESS FOR COMPLETING THE HOOT LAKE MATS
24 PROJECT.

25 A. OTP began issuing contracts and plans in 2013. Various components were ordered and
26 fabricated in 2013 and 2014, and Hoot Lake was shut down in March of 2014 for a planned
27 10-week outage to upgrade the ESPs, install the ACI system, and install the new emissions
28 monitoring systems. The installation went very well. After startup in June through August
29 2014, the system was verified to meet all performance guarantees. After both Hoot Lake
30 units were placed back into service, the balance of the project was to install and verify the
31 emissions monitoring equipment and complete the required testing to demonstrate

1 compliance with the MATS Rule. The entire Hoot Lake MATS project was deemed in
2 compliance and in service on August 21, 2014.

3
4 Q. DID THE HOOT LAKE PROJECT MEET THE PLANNED OBJECTIVES?

5 A. Yes. The MATS Rule became effective on April 16, 2015. The entire Hoot Lake MATS
6 remains in compliance with the MATS Rule. Compared to the original project budget of
7 approximately \$10 million (OTP Total), \$925,000 (OTP SD), the final project cost was
8 \$2.8 million (OTP Total), \$264,088 (OTP SD), or approximately 28 percent below budget.

9
10 Q. WHAT WAS THE FINAL COST OF THE HOOT LAKE MATS PROJECT?

11 A. The final cost of the Hoot Lake MATS project was \$7.145 million (OTP Total), \$660,091
12 (OTP SD).

13
14 **V. CONCLUSION**

15 Q. HAVE THE BIG STONE AQCS PROJECT AND HOOT LAKE MATS PROJECT
16 ACHIEVED THE DESIRED REDUCTIONS IN EMISSIONS?

17 A. Yes. The Big Stone AQCS project and Hoot Lake MATS project have achieved the desired
18 reductions necessary to comply with regulations and are performing as expected.

19
20 Q. WERE THE BIG STONE AQCS PROJECT AND THE HOOT LAKE MATS PROJECT
21 COMPLETED UNDER THE ORIGINAL BUDGETS?

22 A. Yes. The Big Stone AQCS project, which was OTP's largest-ever capital expenditure, has
23 been completed for a cost approximately 26 percent under budget. OTP also completed
24 the Hoot Lake MATS project approximately 28 percent under budget. I have explained
25 the sources of these savings in my Direct Testimony.

26
27 Q. WAS THE BIG STONE AQCS PROJECT COMPLETED ON SCHEDULE?

28 A. Yes. The Big Stone AQCS project was completed on schedule and within the time period
29 required by the regulations. Commercial operation was delayed by approximately two

1 months from the anticipated in-service date because of issues identified during routine
2 maintenance of the Big Stone plant. The delay was not related to the AQCS project.

3
4 Q. HAS THE ON TIME AND UNDER-BUDGET COMPLETION OF THESE CAPITAL
5 EXPENDITURES RESULTED IN SIGNIFICANT CUSTOMER SAVINGS?

6 A. Yes. Mr. Tommerdahl explains the significant savings that have resulted for all OTP
7 customers, including a significantly lower revenue requirement for South Dakota
8 customers in this rate case. Mr. Tommerdahl also explains the lasting benefits to customers
9 that will continue for many years into the future.

10
11 Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

12 A. Yes, it does.