

SOUTH DAKOTA PUBLIC UTILITIES COMMISSION

CASE NO. EL05-022

IN THE MATTER OF THE APPLICATION BY OTTER TAIL POWER COMPANY

ON BEHALF OF THE BIG STONE II CO-OWNERS

FOR AN ENERGY CONVERSION FACILITY SITING PERMIT FOR THE

CONSTRUCTION OF THE BIG STONE II PROJECT

DIRECT TESTIMONY

OF

RAYMOND J. WAHLE

DIRECTOR, POWER SUPPLY AND OPERATIONS

MISSOURI RIVER ENERGY SERVICES

MARCH 15, 2006



TESTIMONY OF RAYMOND J. WAHLE

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1 **BEFORE THE SOUTH DAKOTA PUBLIC UTILITIES COMMISSION**

2 **DIRECT TESTIMONY OF RAYMOND J. WAHLE**

3 **I. INTRODUCTION**

4 **Q: State your name and business address.**

5 A: Raymond J. Wahle, 3724 West Avera Drive, Sioux Falls, 57105.

6 **Q: By whom are you employed and in what capacity?**

7 A: I am the Power Supply & Operations Director for Missouri River Energy Services. I am
8 responsible for directing activities relating to MRES' power supply including directing the
9 operation and maintenance of the WMMPA owned and operated generationg assets; purchases
10 and sales of energy to optimize MRES' power supply costs; the submitting of bids and offers,
11 market settlements, financial transmission rights, asset registration and meter data submittal in
12 the Midwest Independent System Operator energy market; and planning for future power supply
13 resources including negotiating contractual arrangements associated with acquiring future
14 resources.

15 I am also responsible for acquiring the necessary transmission assets or making the
16 necessary transmission arrangements to deliver the output of our acquired resources to MRES
17 members. This includes transmission studies, planning future transmission assets, and
18 negotating contractual arrangements associated with owned transmission facilities.

19 **Q: What is your educational background?**

20 I earned a Bachelor of Science degree in Electrical Engineering from the South Dakota
21 School of Mines and Technology in 1979. I also earned a Masters degree in Business
22 Administration from the University of South Dakota in 1989.

1 **Q: What is your employment history?**

2 A: From 1972 until 1975 I served in U.S. Army. I was a Personnel Security Specialist and
 3 was responsible for control and dissemination of classified information and the initiation of
 4 personnel security investigations. After I earned my Bachelor of Science degree in Electrical
 5 Engineering, I joined Missouri River Energy Services in 1979. From 1979 until 1980 I held the
 6 position of Electrical Engineer and reported to the Supervisory Engineer in the Engineering
 7 Department. In 1980 I was promoted to Planning Engineer and held that position until 1986. In
 8 1986 I was promoted to Manager, System Operations Department and was responsible for
 9 purchases and sales of energy to meet MRES' needs and the scheduling of maintenance for
 10 generating equipment. I reported to the General Manager. In 1990, I was promoted to my
 11 present position of Director, Power Supply & Operations Department and I report directly to the
 12 MRES CEO.

13 **Q: What professional organizations do you belong to?**

14 A: I am a member of Institute of Electrical and Electronics Engineers and I am a registered
 15 professional engineer in the State of South Dakota.

16 **Q: Have you submitted testimony in other administrative or judicial proceedings**
 17 **dealing with energy and related issues?**

18 A: Yes. I submitted pre-filed testimony and testified in Missouri Basin Municipal Power
 19 Agency v. Western Area Power Administration, Federal Energy Regulatory Commission Docket
 20 No. TX97-7-000. I also testified in the Application for Waiver Requested by Western Minnesota
 21 Municipal Power Agency ("WMMPA") from the Iowa Utilities Board ("IUB") for the
 22 construction of WMMPA's Exira Station, IUB Docket No. WRU-03-19.

1 **II. PURPOSE AND SUMMARY OF TESTIMONY**

2 **Q: Describe the purpose of your testimony.**

3 A: The purpose of my testimony is to provide information on why Western Minnesota
 4 Municipal Power Agency and Missouri River Energy Services chose to participate in the Big
 5 Stone Unit II project and to discuss our level of participation. I am also providing information
 6 regarding WMMPA and MRES.

7 **Q: Please summarize your testimony.**

8 A: MRES has undertaken, through its S-1 contracts with most of its members, the obligation
 9 to provide supplemental power to meet the power and energy requirements of these members
 10 through January 1, 2046. Using only existing generation resources, however, MRES will fall
 11 short of capacity by 2011. In order to meet these growing needs in a responsible and reliable
 12 manner, MRES needs to add base load generation to its resource mix. At the same time, MRES
 13 must be mindful of the costs of transmission constraints, efficiency, reliability, and many other
 14 factors that impact the rates of MRES members and their customers. In its search for practical
 15 generation alternatives that provided reliable power in a fiscally responsible manner, MRES
 16 determined that the proposed Big Stone Unit II project would provide reliable, low-cost energy
 17 and other benefits to MRES members and their customers in the most practical and least-cost
 18 manner.

19 **III. WESTERN MINNESOTA MUNICIPAL POWER AGENCY**

20 **Q: Please describe WMMPA.**

21 A: Western Minnesota Municipal Power Agency (WMMPA) was incorporated on June 16,
 22 1976 as a municipal corporation and political subdivision of the State of Minnesota, for the
 23 purpose of providing a means for its members to secure, by individual or joint action among

1 themselves or by contract with other public or private entities within or outside of the State of
 2 Minnesota, an adequate, economical and reliable supply of electric energy. Currently WMMPA
 3 consists of 23 member municipal utilities, 22 of which are also members of MRES. WMMPA's
 4 principal activity is the acquisition and ownership of power supply and transmission projects and
 5 the sale of WMMPA's entitlement to the power, energy and transmission capability associated
 6 with these projects to MRES pursuant to the Power Supply Contract between WMMPA and
 7 MRES.

8 **Q: Describe the governance structure of WMMPA.**

9 A: The powers of WMMPA are exercised by its board of directors and WMMPA may
 10 perform any act authorized by the Minnesota Statutes through or by means of its officers, agents
 11 or employees or by contract with any person. WMMPA is governed by a seven person board of
 12 directors. Four of the directors are representatives of the four Minnesota cities that pay the
 13 largest amount of revenue collected by MRES, pledged as security for repayment of WMMPA
 14 bonds, with the remaining three directors elected by the vote of a majority of representatives of
 15 the member municipalities.

16 **IV. MISSOURI RIVER ENERGY SERVICES**

17 **Q: Please describe MRES.**

18 A: Missouri River Energy Services (MRES) began in early 1960's as an informal association
 19 of northwest Iowa municipalities which owned their own municipal electric systems who
 20 decided to coordinate their efforts in negotiating the purchase of power and energy from the
 21 United States Bureau of Reclamation of the United States Department of Interior (USBR), the
 22 predecessor to the Western Area Power Administration (WAPA). MRES was established as
 23 body corporate and politic organized in 1965 under Chapter 28E of the Iowa Code and existing

1 under the intergovernmental cooperation laws of the States of Iowa, Minnesota, North Dakota
 2 and South Dakota. Municipalities in Minnesota, North Dakota and South Dakota subsequently
 3 joined MRES pursuant to compatible enabling legislation in each state.

4 In response to the 1970 notice by the USBR that the preference customers purchasing
 5 their full power and energy requirements from the UBSR would have to look elsewhere for
 6 power and energy to meet their load growth requirements beyond 1977 levels, MRES developed
 7 a power supply program to deliver firm power and energy to supplement the hydroelectric power
 8 and energy available to the members from the USBR.

9 MRES is a not-for-profit joint-action agency serving 60 member communities, including
 10 our newest member Hutchinson, Minnesota. Fifty-seven of these members have long-term
 11 power supply contracts under the Power Sale Agreement (S-1) with MRES. Each MRES
 12 member owns and operates its local electric utility and the residents of each city determine how
 13 their individual utility is operated.

14 **Q: Describe the governance structure of MRES.**

15 A: MRES' board is comprised of 13 persons elected by the membership from among the
 16 representatives of the member municipalities. Each director serves for a term of three years.
 17 Five of MRES' current board members are also members of the board of directors of WMMPA.

18 **Q: Please describe the relationship between MRES and WMMPA.**

19 A: On October 1, 1976, MRES and WMMPA entered into a Power Supply Contract. The
 20 Power Supply Contract provides that WMMPA shall sell and MRES shall purchase on a "take
 21 and pay" basis all of WMMPA's entitlement with respect to each project covered by the Power
 22 Supply Contract to meet MRES' contractual obligations to provide supplemental power to
 23 MRES' S-1 customers.

1 The projects under the Power Supply Contract available to MRES includes the output
 2 from the Missouri Basin Power Project, a three unit coal fired power plant located near
 3 Wheatland, Wyoming; the Watertown Peaking Plant, a combustion turbine operated on fuel oil
 4 located in Watertown, South Dakota; the Exira Station, consisting of two combustion turbines
 5 operated on natural gas located near Brayton, Iowa; and the Worthington Wind Project, located
 6 near Worthington, Minnesota.

7 Given the close relationship between WMMPA and MRES, I will include all the
 8 information for both WMMPA and MRES, but will refer to MRES when answering the
 9 following questions about WMMPA and MRES.

10 **Q: Please describe MRES' service territory, load and capability, generation and**
 11 **delivery resources.**

12 A: The MRES' service area extends some 650 miles north and south and approximately 400
 13 miles from east to west over portions of eastern North Dakota, eastern South Dakota, western
 14 Minnesota and western Iowa. The total population of MRES' S-1 member communities was
 15 233,403 in the 2000 U.S. census. In 2000, the smallest S-1 member community was Pickstown,
 16 South Dakota with a population of 168. The largest S-1 member is Moorhead, Minnesota with a
 17 population of 32,177. On average, S-1 members have a population of about 4,100.

18 One of the major power supply resources for MRES' S-1 members is their allocation of
 19 hydroelectric power produced from the dams on the Missouri River. The U. S. Army Corps of
 20 Engineers (Corps) constructed the dams on the Missouri River and U. S. Bureau of Reclamation
 21 and the Western Area Power Administration (WAPA) markets the output of these dams. The
 22 WAPA contracts with the MRES' S-1 members have been extended until December 31, 2020.
 23 WAPA also operates over 8,000 miles of high voltage transmission lines and associated

1 substation facilities. These transmission facilities are used by WAPA and MRES to deliver
 2 power and energy to MRES' S-1 members.

3 The other major source of electric energy for each of MRES' S-1 members is the power
 4 and energy provided by MRES. Under each S-1 Agreement, MRES has agreed to sell, and each
 5 S-1 customer has agreed to purchase, all electric power and energy required by the municipality
 6 to meet the needs of its customers over and above the power and energy supplied by WAPA (and
 7 Heartland Consumer Power District) to the municipality.

8 The S-1 Agreement provides for the MRES' S-1 members to receive their supplemental
 9 power at points of delivery designated on the federal transmission system. Of the 57 S-1
 10 members, 13 are connected directly to the federal transmission system and 44 receive their
 11 power and energy over intervening, connected systems. The contracts between WAPA and its
 12 preference customers providing for the sale and delivery of firm power include provisions for
 13 delivery of WAPA power either to the direct interconnection between a preference customer
 14 system and the federal transmission system, or to the interconnection between the federal
 15 transmission system and an intermediary transmission provider for delivery to the preference
 16 customer.

17 Those MRES S-1 members who receive their WAPA hydroelectric power from
 18 transmission systems of intervening utilities located between the federal transmission system and
 19 their systems also have arranged with those intervening utilities for similar transmission service
 20 for their supplemental power purchased from MRES.

21 In 1999, MRES entered into a network open access transmission agreement with WAPA
 22 for delivery of its energy over the federal transmission system known as the Integrated System
 23 (WAPA IS). The WAPA IS consists of all of WAPA's transmission facilities of the Pick-Sloan

1 Eastern Division in the Eastern and Western Interconnections as well as the transmission
 2 facilities owned by two other regional utilities in the Eastern Interconnection. The WAPA IS
 3 rate is established by WAPA and confirmed by the Federal Energy Regulatory Commission.

4 **V. MRES AGREEMENTS**

5 **Q: Please describe the key terms of the S-1 Agreement.**

6 A: The S-1 Agreement is a long-term contract whereby MRES has the obligation to acquire
 7 a supply of firm power and energy and ancillary services to meet the needs of the S-1 members
 8 over and above the power and energy supplied by WAPA. The end point of the S-1 contract is
 9 January 1, 2046, with S-1 contract holders having the ability to cap their purchases from MRES
 10 starting in 2020. The S-1 contract provides for the unbundling of the S-1 rate in 2007 by
 11 establishing a separate rate for power supply and transmission. The power supply rate will be
 12 the same for each member, but the transmission rate will reflect the actual costs incurred by
 13 MRES to deliver its power, energy and ancillary services. The rates under the S-1 are set by the
 14 MRES board, typically on an annual basis.

15 **Q: Please describe the key terms of the Hutchinson Power Sale Agreement.**

16 A: The Power Sale Agreement (PSA) between WMMPA, MRES and Hutchinson is a long-
 17 term "participation agreement" for the joint development, construction and operation of the Big
 18 Stone Unit II. The PSA has a base term of 35 years beginning from the commercial operating
 19 date of the unit. Beginning with the commercial operation date, the PSA requires MRES to
 20 supply, and Hutchinson to purchase and receive from MRES, approximately 40 MW of capacity
 21 and related energy from the Big Stone Unit II, depending on the actual rating of Big Stone Unit
 22 II.

1 **VI. DECISION TO PARTICIPATE IN THE BIG STONE UNIT II PROJECT**

2 **Q: What general factors did the company consider in determining there was a need for**
 3 **participating in the ownership of the proposed Big Stone Unit II?**

4 A: MRES has a predicted shortage of low cost generating resources beginning in 2011. The
 5 Big Stone Unit II project fits the time frame in which MRES needs additional reliable generation
 6 that can supply the needed low cost base load energy. MRES also needs dispatchable generation
 7 in the MISO footprint so that MRES can better match its generation and load. The Big Stone
 8 Unit II project is available in this time period. Also, there is a lack of other practical reliable
 9 options that can meet all the benefits that the unit has to offer.

10 MRES and WMMPA have adopted the planning philosophy and goal of owning and
 11 controlling the majority of their generation resources rather than relying on the market or short-
 12 term power purchase arrangements. The Big Stone Unit II ownership arrangement allows
 13 MRES/WMMPA to own the Big Stone Unit II generation asset as a tenant in common with the
 14 other project owners.

15 **Q: What other factors led MRES to participate in this proposed project?**

16 A: Because MRES has the obligation to meet the increasing needs of its S-1 members,
 17 MRES must plan for and acquire the necessary power supply resources required to meet these
 18 needs. MRES' share of the 2005 peak demand of the S-1 members was 352 MW. As discussed
 19 in Mr. Gerald Tielke's Direct Testimony, MRES' total S-1 member demand load is forecasted to
 20 grow at an annual rate of 1.8% from 2005 to 2014. While MRES only currently supplies about
 21 half of its S-1 members' needs, the amount of power and energy that the members purchase from
 22 WAPA and Heartland Consumers Power District is fixed (the amount of power on the federal
 23 hydro projects is limited), MRES effectively has the obligation to provide for the entire growth

1 in demand and energy of its members. This means that MRES' energy growth rate is 3.6% from
 2 2006 to 2015. Big Stone Unit II is intended to help meet the needs of MRES members for
 3 capacity and energy in a timeframe in which MRES needs additional capacity and energy.

4 As discussed in Mr. Tielke's Direct Testimony, Big Stone Unit II turned out to be the
 5 most economic option. This is due in part because the location of Big Stone Unit II eliminates
 6 pancaked transmission rates for MRES. Currently, most of MRES generation is interconnected
 7 with the WAPA IS transmission system. This means that MRES must pay a transmission service
 8 charge to WAPA to get the generation interconnected with the WAPA system to the MRES
 9 member load located on other transmission systems. Paying a transmission service fee to
 10 WAPA, plus paying for the transmission service to the owner of the transmission facilities on
 11 which a member is located, is referred to as pancaked transmission fees. Since the Big Stone
 12 Unit II will be interconnected to the Otter Tail Power Company transmission system, MRES will
 13 avoid paying a pancaked transmission service fee to WAPA for the output of the Big Stone Unit
 14 II facility.

15 Big Stone Unit II will be in the Midwest Independent System Operator (MISO) footprint.
 16 Even though MRES has a significant amount of load in the MISO footprint, MRES does not
 17 have any significant generation assets in the MISO footprint. Having base load generation in the
 18 MISO footprint would increase MRES efficiency due to a reduction in losses of energy on the
 19 transmission system.

20 Big Stone Unit II is dispatchable. Some generating technologies are non-dispatchable,
 21 e.g., wind. Having a dispatchable resource in the MISO footprint allows MRES to change the
 22 output of its share of Big Stone Unit II to match either the MRES load or the dispatch
 23 instructions of MISO. This will enable MRES to fully utilize the output of MRES' share of the

1 Big Stone Unit II resource without having to acquire additional transmission service, a huge
 2 benefit.

3 Big Stone Unit II location will also create a long-term hedge on future congestion costs
 4 and losses. Big Stone Unit II will almost be in the geographic center of the MRES native load.
 5 Of the 57 MRES S-1 members, 44 are within 150 miles of Big Stone Unit II. It is not possible to
 6 have a perfect hedge of long-term congestion costs or to have a hedge on losses. However,
 7 having generation close to your load reduces the probability of incurring significant congestion
 8 costs or loss costs. Congestion costs arise when there is a constrained transmission path between
 9 the point of receipt and point of delivery. Having generation close to load reduces this
 10 possibility. Likewise, transmission losses tend to increase due to distance of load from the
 11 generation. Again, having the generation close to the load reduces this probability.

12 Last, OTP is the current operator of Big Stone Unit I and OTP operates other coal fired
 13 generation plants. OTP is a proven operator. Big Stone Unit II will use a reliable and proven
 14 technology to generate electricity. It will also use stable priced domestic fuel for generation.
 15 This means that Big Stone Unit II will be a long-term reliable generation resource for MRES and
 16 its members.

17 **Q: What percentage of the output of the proposed Big Stone Unit II has your company**
 18 **contractually committed to own?**

19 A: MRES has committed to take 25%, or an estimated 150 MW of the unit. This includes
 20 110 MW to meet our S-1 member needs and 40 MW to fulfill our obligation to the city of
 21 Hutchinson, Minnesota.

22 **Q: How is your company going to pay its share of the construction and operating costs**
 23 **of the proposed Big Stone Unit II?**

1 A: WMMPA intends to issue short- and long-term debt to acquire the necessary capital to
 2 cover the construction cost. Once the plant becomes operational, MRES intends to adjust the
 3 rates it charges to its members to cover the debt service costs and all of the operating costs. The
 4 Power Supply Contract between MRES and WMMPA and the S-1 Agreement between
 5 WMMPA, MRES and its members provide the long-term security of the WMMPA bonds.

6 **Q: What benefits do you see Big Stone Unit II affording your company's customers?**

7 A: One of the benefits of the proposed Big Stone Unit II offers to MRES members and their
 8 customers is stable and long-term price certainty because: (1) the unit will be a dispatchable
 9 resource using proven technology; (2) the project has the advantage of MRES owning generation
 10 and therefore not being subject to fluctuations of buying power in the current volatile wholesale
 11 capacity and energy markets; (3) the Big Stone Unit II project reduces pancaked transmission
 12 rates for MRES and its members; (4) Big Stone Unit II is an investment in proven, less expensive
 13 technology versus more expensive emerging, unproven technology; and (5) Big Stone Unit II is
 14 an investment in a cost-efficient resource that uses domestic fuel supplies versus relying on
 15 natural gas combustion turbines or combined cycle units which are subject to natural gas market
 16 fluctuations and volatility and subject to foreign government interruption.

17 In addition, the project proposes to invest in substantial interconnection facilities that
 18 will increase the reliability of the regional grid which will enhance regional reliability and
 19 enhance potential for wind and other development in the region. It will also provide geographic
 20 diversity from other MRES resources, adding to the reliability of the MRES generation portfolio.

21 A third benefit the project offers to MRES and its members is synergy because: (1) the
 22 unit is being built on a brown-field site adjacent to the existing Big Stone Plant, which will
 23 minimize the impact on the environment; (2) it takes advantage of existing infrastructure such as

1 rail, coal handling and water intake structure; and (3) the proposed Big Stone Unit II will use
 2 some of the same staff as the existing Big Stone Plant, thus utilizing the experience and
 3 knowledge of the current Big Stone staff and reducing the staffing that would be required for two
 4 separate plants.

5 **Q: What alternatives exist to Big Stone Unit II for your customers in the timeframe**
 6 **beginning in 2011 and beyond?**

7 A: Big Stone Unit II is the only feasible base load resource that is available to MRES by
 8 2011. If Big Stone Unit II is not built, or if MRES does not participate in the project, MRES
 9 would need to develop other options in order to fulfill its contractual obligations to its S-1
 10 members and Hutchinson. Beyond 2011, there are very few base load facilities available to
 11 MRES and none of the potential facilities will deliver the same benefits as the proposed Big
 12 Stone Unit II. Currently there is a group of utilities discussing the possibility of forming a
 13 project similar to Big Stone Unit II, the Resource Coalition. Any project that might come out of
 14 this group, however, will not be on line before 2014. Because the earliest the Resource Coalition
 15 project could be available is 2014, MRES would have to develop other alternatives to the
 16 proposed Big Stone Unit II. These alternatives, which include additional combustion turbine
 17 units or combined cycle units, would be more expensive, and less predictable than the proposed
 18 Big Stone Unit II.

19 **Q: Does this conclude your testimony?**

20 A: Yes.