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

DANIEL JONES

ENVIRONMENTAL SCIENTIST

BARR ENGINEERING COMPANY

MARCH 15, 2006

TESTIMONY OF DANIEL JONES

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BEFORE THE SOUTH DAKOTA PUBLIC UTILITIES COMMISSION

TESTIMONY OF DANIEL JONES

I. INTRODUCTION

Q: Please state your name and business address.

A: Daniel Jones, 4700 West 77th St., Suite 200, Minneapolis, MN 55435-4803.

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

A: Barr Engineering Co., as an Environmental Scientist. My responsibilities include natural resources management, focusing on terrestrial and aquatic ecosystems. My work involves identification, impact analysis, applicable permitting and mitigation planning for wetlands, prairies, forests, sensitive species habitats and unique/rare vegetation communities. I do some similar work with wildlife habitat identification and impact analysis.

Q: What is your educational background?

A: I have a B.S. in Botany and Plant Pathology from Michigan State University (1988), and an M.S. in Biology (Ecology and Evolution) from the University of Oregon (1997).

Q: What is your employment history?

A: I have been in natural resources planning and management since 1984, when I began work as an environmental specialist with the Illinois Department of Transportation (IDOT). My duties there included identification of wetlands, prairies, savanna remnants, threatened/endangered species habitat and cultural resources, and assessment of impacts to these resources that may result from IDOT highway/local road projects. In 1993 I worked as a seasonal employee for the US Forest Service (USFS) Willamette National Forest, where I installed Continuous Vegetation Survey (CVS) plots. These are long-term forest vegetation survey-and-monitor plots. In 1994, the USFS privatized the CVS project, and I began a small

business installing CVS plots. Over a six-year period, I installed over 250 CVS plots on USFS National Forests in Washington, Oregon and northern California. In 1999, I began work with Sheldon & Associates in Seattle, where I conducted wetland delineations and vegetation surveys, and prepared applicable permits. In 2000, I joined Jones & Stokes Associates in Seattle, where I continued to conduct vegetation surveys, rare plant surveys, wetland delineations and other natural resource management projects. Clients and projects included the Williams Companies Seattle-Portland fiber-optic line; Bonneville Power Administration high-voltage transmission line projects in Washington and Oregon; Tacoma Public Utilities water supply lines; ski area expansions in five locations for The SE Group; and the Discovery Park Vegetation Management Plan for the City of Seattle Department of Parks and Recreation.

I joined Barr Engineering Co. in March 2005, and have worked on a variety of pipeline, power plant and mining projects, providing vegetation, wetlands, rare plant species and permitting expertise to those efforts.

Q: What professional organizations do you belong to?

A: I have been a Certified Ecologist in the Ecological Society of America certification program since 2001. This is a national peer-reviewed certification process based on education, professional experience and literature contributions in ecology and natural resources management. I am on the state board of the Minnesota Native Plant Society, and am vice-chair of the Northfield (MN) Environmental Quality Commission. Professional affiliations include the Ecological Society of America, the Society for Ecological Restoration, the Minnesota Wetland Delineators Association and the Society of Wetland Scientists.

II. SITING PERMIT APPLICATION

Q: Were you involved in the preparation of the "Application for a South Dakota Energy Conversion Facility Siting Permit," (Application) dated July 2005, prepared for the Big Stone II Applicants?

A: Yes. I wrote portions of Section 4 of the Application, and reviewed and edited the exhibits for Sections 1, 4 and 5.

III. WATER QUALITY AND RELATED ISSUES (Hydrology and Aquatic Ecosystems) HYDROLOGY (ARSD 20:10:22:15)

Q: Were you involved in evaluating the potential impacts of the proposed Big Stone Unit II on local hydrology?

A: Yes, from the perspective of surface water drainage.

Q: Please describe your involvement.

A: I compiled information on the watersheds, streams and local drainage patterns on and immediately adjacent to the Big Stone property. I used this information to discuss existing surface water drainage and the impacts to surface drainage that would potentially result from construction of Big Stone Unit II.

Q: Please explain hydrology issues as they relate to the proposed Big Stone Unit II.

A: With the exception of the makeup storage pond, the proposed Big Stone Unit II does not yield notable changes in surface water drainage. This is primarily because the plant is a Zero Liquid Discharge (ZLD) design, and as such does not contribute additional discharge to existing surface water drainage patterns. The makeup storage pond will alter local surface water drainage patterns because of its size and configuration. However, this alteration is not expected to have deleterious impacts on local surface water drainage. The source and discharge of surface water

drainage into and off of the Big Stone property remains more or less unchanged; the makeup storage pond simply alters the route of that drainage.

IV. WORK STUDIES REFLECTED IN THE APPLICATION

Q: Did you prepare any written studies/work product that are reflected in the Application?

A: I wrote most of Section 4.2.1 of the Application, which describes the Big Stone property watersheds, streams and local drainage patterns and the potential for impacts to these.

Q: Describe the results of your work.

A: The primary surface water drainage issue involved in the Big Stone Unit II Project is the impact of the makeup storage pond on local surface water drainage patterns. The makeup storage pond will intercept a local surface drainage pattern in the southwestern portion of the proposed project. This surface drainage pattern is overland flow, with an undefined channel, that currently flows roughly southeasterly through the western third of the Big Stone property. The overland flow then enters a large wetland in the southwestern portion of the property and/or flows directly into an unnamed tributary to the Whetstone River that flows easterly out of the wetland. The makeup storage pond will remove the wetland and approximately half of the length of the unnamed tributary. The dikes that will be built to contain the pond will force surface water drainage to flow more easterly, along the northern edge of the new pond, before turning south along the east edge of the pond and returning back to the existing flow into the remaining section of the unnamed tributary to the Whetstone River.

Q: Did you review other studies or work product in making your evaluation and/conclusions?

A: I based most of my work on information compiled in the February 2005 "Big Stone II Project Facility Siting Permit and Transmission Corridors Final Data Collection Report" prepared by Barr Engineering. This includes Geographic Information Systems (GIS) layers showing watersheds, streams and topography. GIS layers are data sets compiled by various government, private and non-profit agencies and organizations. They provide geographically-referenced visual information (aerial photos, maps) that is electronically linked to quantitative and/or descriptive data for a given resource, demographic, landscape feature, etc. GIS layers are available from a variety of sources, and range from free, open-use data to licensed, paid-usage access. The GIS layers that I used for my hydrology work in the Application were from the U.S. Geological Survey (USGS) Digital Elevation Model for topography and watershed divides; the USGS Natural Resources Conservation Service (NRCS) for soils and hydric soils; and the Federal Emergency Management Agency (FEMA) for floodplains. I also consulted South Dakota Department of Game, Fish and Parks, South Dakota Department of Environment and Natural Resources, and South Dakota Rivers, Trails and Conservation Program data and information on Grant County streams

Q: Will the proposed Big Stone Unit II comply with all federal, state and local standards and regulations relating to hydrology once it is constructed and operating?

A: Yes.

Q: How did you obtain and analyze information relevant to your work?

A: I obtained information through consultation with the February 2005 Barr data compilation and web searches on South Dakota state agency sites. As discussed above, the GIS layers compiled in the February 2005 Barr data compilation contain quantitative and descriptive data that I used to determine directions of overland surface flow and the extents of local sub-

watersheds. With this information I was able to estimate the sources of overland flow, the likely drainage patterns that the flows would follow, and the points and/or areas where those flows would discharge into the larger regional drainage system. Streams data from the South Dakota agency websites was used to provide information on mean annual flow of the Whetstone River, and to describe the river's origins and confluence with the Minnesota River.

Q: What other information would you like to add to your testimony?

A: The information provided in Section 4.2, Hydrology, of the Application satisfies most of the requirements of South Dakota Administrative Rules (ARSD) 20:10:22:15. ARSD 20:10:22:15(1) requires a map "showing surface water drainage patterns before and anticipated patterns after construction of the facility." The siting permit application provides a figure with watershed boundaries and topography that show current drainage patterns. However, the figure does not indicate drainage patterns anticipated after construction. This information is provided in the text in Section 4.2.1. Also, ARSD 20:10:22:15(2) requires "a map drawn to scale of the current planned water uses by communities, agriculture, recreation, fish, and wildlife which may be affected by the location of the proposed facility and a summary of those effects." The Application discusses water use within the text of Section 4.2.2 but does not provide a map. The Application meets the remaining applicable requirements of ARSD 20:10:22:15.

V. WATER QUALITY (ARSD 20:10:22:20)

Q: Were you involved in evaluating the potential impacts of the proposed Big Stone Unit II unit to water quality?

A: Yes.

Q: Please describe your involvement.

A: I assisted in identifying the major and minor watersheds, local streams and drainage ways for the Big Stone property.

Q: Please explain the water quality issues as they are related to the proposed Big Stone Unit II.

A: Water quality is a relatively minor issue at Big Stone Unit II because the plant is designed as a Zero Liquid Discharge (ZLD) facility, meaning that there will be no release of water from the plant into local watersheds and/or streams. Moreover, the potential for construction-related impacts will be limited and controlled by the implementation of best management practices (BMPs) for soil erosion. Best management practices are actions, techniques, and measures that prevent or reduce water pollution from nonpoint sources, such as soils exposed by grading or excavation. Examples include the installation of silt fencing around exposed soils areas, the temporary placement of straw bales in ditches or swales that drain a construction site, installation of sediment traps and/or settling ponds and seeding or erosion control blankets on exposed soil piles. The specific BMPs for the Big Stone Unit II project will be detailed in the Stormwater Pollution Prevention Plan (SWPPP) that is part of the National Pollutant Discharge Elimination System (NPDES) permit that will be required prior to the beginning of construction.

Q: Did you prepare any written studies/work product that are reflected in the Application?

A: I wrote most of Section 4.6, Water Quality, in the Application. I worked with Jeff Lee, a limnologist at Barr, to prepare Section 4.6.2 on water quality in the proposed makeup storage pond.

Q: Describe the results of your work.

A: Section 4.6.1 of the Application is similar to the surface water hydrology discussion in Section 4.2.1. It describes surface water drainage within the Big Stone property area. It also discusses the origin and path of the Whetstone River, average flow data for the river, and the impairment status of the Whetstone River. The Whetstone River was on the 2002 South Dakota 303(d) impaired waters list for high ammonia concentrations. A Total Maximum Daily Load (TMDL) study for ammonia was completed and approved by the US Environmental Protection Agency (USEPA) in October 2003. This study determined the maximum daily amount of ammonia that the Whetstone can receive and still meet the water quality standards. The Big Stone Unit II plant will not discharge any water to the Whetstone River, therefore, it will not contribute any additional ammonia to the river. Section 4.6.2 discusses predicted water quality parameters for the makeup storage pond. The water quality analysis conducted by Barr limnologist Jeff Lee indicated that the proposed makeup storage pond will have water quality characteristic of a mildly eutrophic lake, which is similar to the shallow lakes typical of the region. Section 4.6.3 outlines the requirements for construction stormwater management.

Q: Did you review other studies or work product in making your evaluation and/conclusions?

A: As discussed above, I used calculations and analyses prepared by Jeff Lee, a Barr limnologist, to discuss predicted water quality in the makeup storage pond. Water quality analyses were based on Canfield & Bachman water quality modeling methods. Other information consulted included the February 2005 "Big Stone II Project Facility Siting Permit and Transmission Corridors Final Data Collection Report" prepared by Barr Engineering. I also accessed South Dakota Department of Environment and Natural Resources web data and information on Grant County streams.

Q: Please describe the water quality permitting process in South Dakota.

A: Water quality certification required by Section 401 of the Clean Water Act (CWA) is delegated by USEPA to the South Dakota Department of Environment and Natural Resources (DENR). The DENR also reviews NPDES permit applications for construction and for industrial operation. An NPDES permit application requires a Storm Water Pollution Prevention Program (SWPPP), which is a plan outlining the control and capture of sediments and other pollutants in storm water runoff from the plant site.

Q: Will the proposed Big Stone Unit II comply with all federal, state and local standards and regulations relating to water quality once it is constructed and operating?

A: Yes.

Q: How did you obtain and analyze information relevant to your work?

A: I obtained information through consultation with the February 2005 Barr data compilation and web searches on South Dakota state agency sites. Specific GIS layers used for my work included layers from the U.S. Geological Survey (USGS) Digital Elevation Model for topography and watershed divides. Data sets found in the GIS layers in the February 2005 Barr data compilation enabled me to determine the drainage patterns of overland surface flow and the extents of local sub-watersheds. With this information I was able to estimate the sources of overland flow, the likely drainage patterns that the flows would follow, and the points and/or areas where those flows would discharge into the larger regional drainage system. Streams data from the South Dakota agency websites was used to provide information on mean annual flow of the Whetstone River, and to describe the river's origins and confluence with the Minnesota River. The water quality analysis conducted by Jeff Lee for predicting water quality in the

proposed makeup storage pond utilized Canfield & Bachman modeling and analysis methods. This is a commonly-used model for northern temperate lakes.

Q: What other information would you like to add to your testimony?

A: The information provided in Section 4.6 of the Application meets the requirements of South Dakota Administrative Rules 20:10:22:20 on water quality, in that it "provide(s) evidence that the proposed facility will comply with all water quality standards and regulations of any federal or state agency having jurisdiction."

VI. EFFECT ON AQUATIC ECOSYSTEMS (ARSD 20:10:22:17)

Q: Were you involved in evaluating the potential impacts of the proposed Big Stone Unit II unit to aquatic ecosystems?

A: Yes.

Q: Please describe your involvement.

A: I worked with Barr wetland ecologist Mark Jacobson to delineate and classify wetlands on the Big Stone property. Along with Mark Jacobson, I met in the field with John Mitzel from the US Army Corps of Engineers (USACE) office (Omaha District) to review the delineations in the field, to make preliminary jurisdictional decisions and to discuss mitigation options. I continue to work with Mr. Mitzel as I prepare the Section 404 (Clean Water Act) permit application for the filling of Corps jurisdictional wetlands and the preparation of a compensatory mitigation plan. I am currently working with the US Fish & Wildlife Service (USFWS) Partners for Fish & Wildlife (PFW) program to negotiate and coordinate a mitigation plan.

Q: Please explain the aquatic ecosystem issues as they are related to the proposed Big Stone Unit II.

A: There are eighteen wetland basins totaling approximately 105 acres on the Big Stone property. Four of these basins, totaling 82.4 acres are under the jurisdiction of the USACE. The remaining wetland basins are isolated, meaning they have no surface hydrologic connection to waters of the United States. Of the four jurisdictional wetlands, three basins totaling 57.7 acres will be removed by construction of the makeup storage pond. This removal of jurisdictional wetlands necessitates the preparation of a permit to fill wetlands under Section 404 of the Clean Water Act. As part of the permit, a compensatory mitigation plan will be submitted to the USACE to provide wetland area and function equal or greater to the area and function of the wetlands removed. Also, the proximity of the plant to Big Stone Lake and the Whetstone River, and the appropriation of water from Big Stone Lake require a description of fish population present in the lake and river, and an evaluation of potential impacts to fish populations.

Q: Did you prepare any written studies/work product that are reflected in the Application?

A: Yes. I wrote Section 4.4 (on Aquatic Ecosystems (wetlands and fisheries) of the Application.

Q: Describe the results of your work.

A: In Section 4.4.1, I describe the number and types of wetlands present on the Big Stone property. I describe the rationale for determining which of the wetlands are under the jurisdiction of the USACE, and I provide the results of a function assessment for the jurisdictional wetlands. I provide a discussion of mitigation sequencing, which details the reasons why wetlands cannot be prudently or feasibly avoided by the project, and how the proposed design minimizes wetland impacts to the extent practicable. This mitigation sequencing discussion includes an evaluation of the impacts of alternative makeup storage pond

locations and configurations, including an alternative for several smaller ponds instead of one large pond. The mitigation sequencing analysis concludes that the proposed makeup storage pond location is the alternative that minimizes impacts to wetlands. A final component of the wetland discussion that I wrote for the Application is the USACE requirements for mitigation and a conceptual plan for meeting those requirements. The Omaha District of the USACE typically utilizes replacement ratios ranging from 1.5:1 to 10:1 for compensatory mitigation, depending on the mitigation strategy proposed. While the mitigation plan for the Big Stone Unit II project is not yet finalized, the conceptual plan (which is based on conversations with Mr. Mitzel at USACE and with Kurt Forman at USFWS) calls for approximately 87 acres (1.5:1) of restoration to degraded wetlands within the same watershed as the proposed project, or as close as possible to the same watershed. The locations of the degraded wetlands, which will be coordinated with USACE and USFWS, will determine the final acreage of wetlands to be restored.

Fish populations were determined based on information compiled by the Minnesota Department of Natural Resources (DNR) and the South Dakota Department of Game, Fish and Parks and Department of Environment and Natural Resources. There are approximately 31 species of fish potentially present in Big Stone Lake and/or the Whetstone River. Construction and operation of the Big Stone Unit II plant will not result in impacts to fish populations in the Whetstone River, because there will be no discharge to the river. Potential project impacts to fish populations in Big Stone Lake include entrainment, which is the drawing of fish and/or fish eggs into water intakes. The design of the water intake structures currently minimizes entrainment impacts to fish. The design of the water intakes precludes impingement, which is the trapping of fish against intake screens.

Q: Did you review other studies or work product in making your evaluation and/conclusions?

A: I based most of my work on information compiled in the February 2005 "Big Stone II Project Facility Siting Permit and Transmission Corridors Final Data Collection Report" prepared by Barr Engineering. This includes GIS layers showing watersheds, streams and topography, as well as the results of wetland delineations conducted by Barr wetland ecologist Mark Jacobson in September 2004 and June 2005. These delineations were conducted following the 1987 USACE manual on wetland delineations, and were recorded with a Global Positioning System (GPS) unit. I also consulted USFWS National Wetland Inventory mapping for general wetland presence in the region; USACE Omaha District wetland delineation and general wetland information for permitting and mitigation guidance; the Minnesota Board of Water and Soil Resources (MN BWSR) Minnesota Rapid Assessment Methodology (MnRAM) for wetland function assessment; and South Dakota Department of Game, Fish and Parks, the South Dakota Department of Environment and Natural Resources and the Minnesota DNR for information on fish populations in Grant County, the Whetstone River and Big Stone Lake.

Q: Will the proposed Big Stone Unit II comply with all federal, state and local standards and regulations relating to aquatic ecosystems once it is constructed and operating?

A: Yes. The primary permitting issue related to aquatic ecosystems is the USACE Section 404 wetland permit.

Q: How did you obtain and analyze information relevant to your work?

A: I obtained information through consultation with the February 2005 Barr data compilation and web searches to USACE, Minnesota DNR and South Dakota state agency sites.

Specific GIS data used included layers from the USGS Natural Resources Conservation Service (NRCS) for soils and hydric soils; USFWS National Wetlands Inventory for initial wetlands investigations and regional wetland presence; shape files (layers describing specific physical boundaries) generated by Barr and by Burns and MacDonnell showing the proposed project features, and shape files generated by Barr based on GPS coordinates obtained in the field by Barr wetland ecologist Mark Jacobson and me, for the specific delineation of wetlands on the Big Stone property. I used the data contained within the GIS layers to first determine the area of wetlands on the Big Stone property. I then generated an intersection of the wetlands layer and the project features layer to analyze the direct impacts of the project on wetlands. I used the Minnesota Rapid Assessment Methodology (MnRAM) to assess the ecological functions provided by the wetlands affected by the project. The MnRAM was used because there is no analogous methodology from a South Dakota natural resource agency. The wetlands analyzed are similar to wetlands in western Minnesota, and can be accurately and effectively assessed using MnRAM. I also contacted Omaha District USACE wetland specialist John Mitzel both by phone and in person to discuss the 404 permit application and mitigation strategies.

Q: What other information would you like to add to your testimony?

A: The information provided in Section 4.4 (Aquatic Ecosystems) of the Application is consistent with the requirements of ARSD 20:10:22:17. Section 4.4 provides information on "the effect of the proposed facility on aquatic ecosystems, and include(s) existing information resulting from biological surveys conducted to identify and quantify the aquatic fauna and flora, potentially affected within the...siting area, (and) an analysis of the impact of the construction and operation of the proposed facility on the total aquatic biotic environment and planned measures to ameliorate negative biological impacts as a result of construction and operation of

the proposed facility." Also, I would like to emphasize that the Section 404 permit is still an ongoing process. I am currently coordinating the mitigation planning with John Mitzel at the Omaha District USACE and Kurt Forman at USFWS.

Q: Does this conclude your testimony?

A: Yes.