

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

K. ANNE KETZ, M.A., RPA

PRESIDENT AND TECHNICAL DIRECTOR

THE 106 GROUP LTD.

MARCH 15, 2006



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TESTIMONY OF K. ANNE KETZ

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BEFORE THE SOUTH DAKOTA PUBLIC UTILITIES COMMISSION

TESTIMONY OF K. ANNE KETZ, M.A., RPA

I. INTRODUCTION

Q: Please state your name and business address.

A: My name is Anne Ketz. My business address is The Dacotah Building, 370 Selby Ave
St. Paul, MN 55102.

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

A: I am the President and Technical Director of The 106 Group Ltd., a Cultural Resource
Management firm in St. Paul, Minnesota.

Q: Describe your educational background.

A: I graduated from the University of Manchester, England with a Bachelor's degree (with
honors) in Ancient History and Archaeology. I hold a Graduate Certificate in Museum Studies
from the University of Leicester, England, and a Masters degree in Historical Archaeology from
the University of Massachusetts-Boston.

Q: Describe your professional experience.

A: My career in cultural resources management and planning extends over 25 years and
three continents, including projects in North America, Europe, the Middle East and India. I am
certified with the Register of Professional Archaeologists (RPA). My experience is as follows:

- 1992-date The 106 Group Ltd., St. Paul, MN - President and Technical Director
- 1991-1992 BRW, Inc., (now URS) Minneapolis, MN - Principal Investigator
- 1990-1991 Babar Kot, Gujurat, India - Archaeology Trench Supervisor
- 1987-1990 Engineering-Science, Inc., (Parson Corporation) Washington, D.C. -
Laboratory Director *and Data Manager*

- 1 1985-1986 Central Artery North Project, Boston, Massachusetts - *Laboratory*
 2 *Supervisor*
- 3 1985-1986 Whydah Ship Project, Maritime Explorations Inc., Massachusetts and
 4 London, England - *Researcher*
- 5 1984-1985 University of Massachusetts-Boston. Research Assistant, Coordinator of
 6 Boston Cemetery Project
- 7 University of Massachusetts-Boston. *Tutor in Archaeology, Anthropology*
 8 *and English as a Second Language.*
- 9 Professor of History, University of Massachusetts-Boston. *Private*
 10 *Research Assistant*
- 11 1985 Peabody Museum, Harvard University, Massachusetts - *Historical*
 12 *Archaeologist*
- 13 1984 Museum of the City of New York - *Archaeologist and Museum Assistant*
 14 Strawberry Banke, Portsmouth, New Hampshire - *Archaeologist*
- 15 1981 Royal Albert Museum, Exeter, England - *Museum Assistant and*
 16 *Archaeologist*
- 17 Royal Ontario Museum, Toronto, Canada - *Museum Assistant and Exhibit*
 18 *Design Programmer*
- 19 1980 Southampton Museum, England. *Post-Mediaeval Archaeologist and*
 20 *Museum Assistant*
- 21 1979-1980 Manchester Museum, England. *Near Eastern Archaeologist and Museum*
 22 *Assistant*
- 23 1978-1978 Salisbury and South Wiltshire Museum, England - *Museum Assistant*

1 1978 Melandra Roman Fort, Lancashire, England - *Field Archaeologist*

2 **Q: What honors or certifications have you received?**

3 A: The honors and certifications I have received are as follows:

- 4 ▪ Certified with the Register of Professional Archaeologists (RPA)
- 5 ▪ Museology Certification Committee, Society of Professional Archaeologists,
- 6 1993-1995
- 7 ▪ American Institute of Indian Studies, New Delhi; Research Fellowship 1990-
- 8 1991
- 9 ▪ University of Massachusetts - Boston; Graduate Research Fellowship 1984-85
- 10 ▪ University of Leicester, England; Departmental Graduate Scholarship 1980-81
- 11 ▪ University of Manchester, England; Department of Education and Science,
- 12 Government Education Grant, 1977-80
- 13 ▪ Duke of Edinburgh's Award; Bronze, Silver and Gold Awards 1973-76
- 14 ▪ Course Participant - St. George's College, Jerusalem, Israel, 1976. Participated
- 15 in a course studying the region's history, cultures, political and religious
- 16 diversity, etc. and visited many archaeological and religious sites

17 **Q: What work experience do you have that is relevant to your testimony?**

18 A: During my 14 years as co-owner, President and Technical Director of The 106 Group, I
 19 have worked on a wide variety of cultural resource management projects for dozens of clients
 20 throughout the Midwest. I have published articles and presented papers at regional, national and
 21 international conferences, and have authored or co-authored over 100 survey reports and ten data
 22 recovery/mitigation reports in the District of Columbia, Maine, Maryland, Massachusetts,
 23 Minnesota, New Hampshire, New Jersey, North Dakota, Virginia, Washington, and Wisconsin.

1 The most recent example is a paper presented to US/ICOMOS 8th International Symposium on
 2 Heritage Interpretation in Charleston, South Carolina, May 2005 entitled *Dakota Stories and*
 3 *Places: Collaboration with, and New Interpretations of a Neglected Native Community.*

4 I maintain close and open communication between clients, State Historic Preservation Officers
 5 (SHPO), State Archaeologists, American Indian leaders, community stakeholders, project team
 6 members, and other concerned parties, to ensure smooth progress of projects. I also define
 7 project scopes and processes in consultation with clients and review agencies. Examples of
 8 projects include

- 9 2005-2006 Mesaba Energy Project, Excelsior Energy, Iron Range, MN
- 10 2004-2005 Smith Avenue Transit Hub, Data Recovery Program, St. Paul, MN
- 11 2004-2005 PolyMet Mining Cultural Resources Planning, Iron Range, MN
- 12 2003-2006 Historic Murphy's Landing Master Plan, Scott County, MN
- 13 2001-2005 Bruce Vento Nature Sanctuary at Lower Phalen Creek, St. Paul, MN
- 14 1997-1999 Science Museum of Minnesota, Archaeological Data Recovery of the
 15 Washington Street Residential District, St. Paul, MN
- 16 1995-2003 Phalen Boulevard, St. Paul, MN
- 17 1997-2002 Literature Search for Devil's Lake Basin and Sheyenne River, ND
- 18 2003-2005 Spring Lake Park Interpretive Plan, Cultural Resources, Dakota County,
 19 MN
- 20 2001-2002 Shakopee Mdewakanton Dakota Community, Cultural Resources
 21 Consultation

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

23 **A: International Council on Monuments and Sites (ICOMOS)**

- 1 ▪ Minnesota Historical Society
- 2 ▪ National Trust for Historic Preservation
- 3 ▪ Society for American Archaeology
- 4 ▪ Society for Historical Archaeology

5 **Q: What classes and other training have you taken relating to the subject matter of**
 6 **your testimony?**

7 A: Integrating Cultural Resources in NEPA Compliance. Training course by the National
 8 Preservation Institute, November 2004.
 9 40-hour Hazardous Waste Operations Worker (HAZWOPER) (OSHA 29 CFR
 10 1910.120)

11 **II. EVALUATION OF POTENTIAL EFFECTS TO CULTURAL RESOURCES**

12 **Q: Were you involved in evaluating the potential effects of the proposed Big Stone II**
 13 **unit to cultural resources?**

14 A: Yes.

15 **Q: Please describe your involvement.**

16 A: The 106 Group has been hired as a consultant by Otter Tail Power to conduct cultural
 17 resource investigations for the Big Stone II Plant. During March and April of 2005, The 106
 18 Group Ltd. conducted a preliminary cultural resources survey of the Big Stone II project area.
 19 These investigations were conducted under contract with Barr Engineering Company for the Big
 20 Stone II Applicants. Fundamentally, this research and my expertise will serve as
 21 recommendations to Western Area Power Administration (Western) and SHPO. In concert, they
 22 will make the final cultural resource management decisions and will dictate the procedures for all
 23 work.

1 As the *Technical Director* for all cultural resources projects conducted by The 106
 2 Group, I oversaw all aspects of architectural history and archaeology research, survey,
 3 identification and evaluation for Big Stone Unit II assessment. As well, I reviewed and edited
 4 the Programmatic Agreement (PA), which assigns roles and responsibilities for the federal
 5 process related to archaeological, historic and cultural resources. It is the role of the PA to
 6 ensure that all interested parties are involved in decisions regarding the treatment of
 7 archaeological sites, historic properties and traditional cultural properties (TCPs) (places
 8 associated with cultural practices or beliefs of a living community's history or identity) that may
 9 be affected by the Project. I am not directly involved in any Native consultation in the Big Stone
 10 Unit II Project, however. Western has taken the lead on Native consultation, including sending
 11 government-to-government consultation letters in June of 2005.

12 My role on the Big Stone Unit II Project, more specifically, was as *Principal Investigator*
 13 for Archaeology. This entailed overseeing and directing all aspects of the archaeological
 14 assessment, from defining methodology, the literature research, site visit, determination of areas
 15 of high archaeological potential, and final results report. I did not make an initial site visit with
 16 the project archaeologist, but have made subsequent visits.

17 **III. PROGRAMMATIC AGREEMENT**

18 **Q: What is the Programmatic Agreement and what is its role?**

19 A: As stated above, the PA assigns roles and responsibilities for the federal process related
 20 to archaeological, historic and cultural resources. It is the role of the PA to ensure that all
 21 required parties concur with a decision making process, and all interested parties are involved in
 22 decisions regarding the identification, evaluation and treatment of archaeological sites, historic
 23 properties and traditional cultural properties (TCPs) that may be affected by the Project. The PA

1 is the primary dictator of rules and expectations dealing with cultural resources prior to the
 2 construction of the proposed Big Stone Unit II. It is the "go-to" document when questions arise,
 3 and it determines the scope of all work to be undertaken by The 106 Group. At time of writing
 4 this testimony the PA is in draft form.

5 **Q: Who are the key players involved in the PA?**

6 A: The Minnesota State Historic Preservation Office, South Dakota State Historic
 7 Preservation Office, and Western Area Power Association are the primary, required signatories.
 8 Otter Tail Corporation is an invited party, as are several American Indian Tribes who have
 9 cultural interest in the area. These Tribes are the Flandreau Santee Sioux Tribe, Sisseton-
 10 Wahpeton Oyate of the Lake Traverse Reservation, Yankton Sioux Tribe of South Dakota,
 11 Prairie Island Indian Community, Lower Sioux Indian Community, Upper Sioux Indian
 12 Community, Shakopee Mdewekanton Sioux Community, and the Santee Sioux Nation of
 13 Nebraska. Probable consulting parties consist of the Minnesota Department of Natural
 14 Resources, the Minnesota Public Utilities Commission, the Minnesota Environmental Quality
 15 Board, and the South Dakota Public Utilities Commission.

16 **Q: Describe who Western is and what their role is in the process.**

17 A: Western Area Power Administration is a branch of the federal government, Department
 18 of Energy that markets and delivers electric power in a 15 state region of the central and western
 19 United States. It is their charge to oversee and implement all federal requirements pertaining to
 20 cultural resources. To systematize and regulate cultural resource management, Western has
 21 developed a Cultural Resources Protection Manual. This Manual and the definitions outlined
 22 within form the backbone to cultural resource investigations at Big Stone II Plant.

1 **Q: What portion(s) of the Application for a South Dakota Energy Conversion Facility**
 2 **Siting Permit did you write or contribute to?**

3 A: The 106 Group, for which I was the Principal Investigator for Archeology, prepared the
 4 May 2005 report entitled, "Archaeological Assessment and Architectural History Survey for the
 5 Big Stone II Project, Big Stone City, Grant County, South Dakota" is included as Exhibit D in
 6 the Application for a South Dakota Energy Conversion Facility Siting Permit.

7 **Q: Describe the cultural resources issues as they relate to the proposed Big Stone Unit I**

8 A: Big Stone Unit II construction will include a new power plant and adjacent exterior
 9 equipment of the coal-fired steam generator, including a smoke stack; a cooling tower and
 10 adjacent cooling tower blowdown pond; and a new coal handling and storage equipment, all to
 11 be positioned in close proximity to the existing Big Stone power plant. Based on the cultural
 12 resources survey done to date, no material adverse effects on cultural resources appear evident.
 13 If further cultural resource investigations become necessary, they will be addressed according to
 14 the terms of the Programmatic Agreement.

15 Cultural resources under examination in relation to the Big Stone Unit II Project are: 1)
 16 archaeological materials and sites dating to pre-European settlement and Euro-American
 17 settlement periods that are, or may be, currently located within the project area; and 2) historic
 18 properties (buildings and structures), eligible for the National Register of Historic Places
 19 (NRHP). The NRHP is a list of properties, maintained by the National Park Service, that
 20 represent a major historical theme, style, person or era. Typically, a property needs to be at least
 21 50 years old to be considered eligible for listing on the NRHP. Properties in Big Stone Unit II
 22 area were examined based on NRHP criteria.

1 **IV. IDENTIFICATION AND EVALUATION PROCESS**

2 **Q: Explain the process of identifying and evaluating cultural resources at Big Stone**
 3 **and discuss what has been carried out thus far.**

4 A: The process of cultural resource identification and evaluation involves several steps.
 5 Thus far, the following steps 1- 4 have been completed. I directed the work associated with these
 6 steps.

7 Step 1) It is necessary to determine the geographic area within which development may
 8 alter site or property character or use. This area is known as the APE, or area of potential effects.
 9 The APE was defined by The 106 Group and through informal consultation with the South
 10 Dakota SHPO (SD SHPO) for the Big Stone Unit II Project as extending 1-mile outward from
 11 the center of the proposed Plant, and ½ mile outward from the proposed water storage pond.
 12 This APE was informally defined with regard to physical, auditory, or visual impacts to historic
 13 properties during a SD SHPO/106 Group meeting on March 7, 2005, and later reinforced in a
 14 telephone conversation, March 23, 2005, between Betsy Bradley, Ph.D. (The 106 Group
 15 Principal Investigator for Architectural History) and Stephen Rogers of the SD SHPO. The
 16 architectural history APE at BSII is approximately 3,599 acres (1,456 hectares [metric
 17 equivalent]). The area of potential effects for archaeology is the same as the project area and
 18 includes all areas of proposed construction activities or other potential ground-disturbing
 19 activities associated with the construction of the Big Stone II power plant. At the time of the
 20 study in March 2005, the APE for archaeological resources at Big Stone Unit II was
 21 approximately 3,189 acres (1,291 hectares). Based on areas of impact in the site permitting
 22 application, plans will not impact areas of high archaeological potential.

23 Step 2) It is necessary to identify what cultural resources may exist in the area;

1 A Class I archaeological study has been completed within the current project boundaries.
2 A Class III study has been completed that identifies and determines the NRHP-eligibility of
3 architectural history resources in the SD SHPO-defined 1-mile APE.

4 Step 3) It is necessary to evaluate these cultural resources to determine if they are eligible
5 for listing on the NRHP. A Class III archaeological survey has not yet been determined
6 necessary.

7 Step 4) It is necessary to identify potential adverse effects of disturbing or damaging
8 resources. In terms of architectural history, a preliminary determination of effects to NRHP-
9 eligible buildings and structures has occurred.

10 **Q: What is the area of potential effect?**

11 A: The area of potential affect (APE) for historic buildings and structures is currently a 1 –
12 mile radius from the proposed new power plant building, and is based on informal SHPO
13 consultation. Our studies to date have been based on the 1- mile radial area, and no materially
14 significant adverse effects have been found in this defined area. On Wednesday, March 15,
15 2006, I will be attending a meeting with Western, who at that time is expected to determine
16 whether a different area of potential affects will be adopted. Western may decide to define the
17 APE as any of the following: the current 1-mile area from the proposed new plant; a two-mile
18 radius from the center of the proposed power plant building itself; a two-mile radius from the
19 project area; or a two-mile radius from the property border. If one of the broader options should
20 be implemented by Western, then our study will expand accordingly, and will follow the rules
21 and stipulations of the Programmatic Agreement.

22 **Q: What is your professional opinion as to the Big Stone II project's effects on cultural**
23 **resources?**

1 A: In my professional opinion, no adverse effects were found on any of the National
2 Register eligible buildings within the one-mile radial area we have studied to date. In terms of
3 archaeology, once the Class III archaeological survey has occurred, the potential effects to
4 archaeological resources can be fully determined. However, pursuant with the PA, Western has
5 agreed to develop measures to avoid, reduce or mitigate any adverse effects, and address
6 unexpected discoveries of cultural resources.

7 **Q: Describe the process of identification and evaluation in the 2005 Archaeological**
8 **Assessment and Architectural History Survey Report.**

9 A: To determine both the precedent for and the fact of cultural resources in the area, a
10 comprehensive Class I survey was undertaken, including background research and field
11 assessment, as articulated below

12 **Q: What research was done to identify historic properties?**

13 A: One of the first steps is the identification of potential sites and properties having
14 historical significance. The 106 Group conducted background research at the SD SHPO on
15 March 3, 2005, for information on previously identified historic properties and previously
16 conducted archaeological surveys in the project area and the APE. We used SD SHPO's
17 searchable database for historic structures and archaeological sites. This database comes with
18 digital maps for locating properties. It is known as the CRGRID (Cultural Resource Geographic
19 Research Information Display). We also examined newspaper records from the early 20th
20 century to identify construction dates of historic structures.

21 **Q: What did the research reveal about archaeological sites?**

22 A: Four archaeological sites have been recorded and confirmed within one mile of the
23 proposed Big Stone Unit II construction areas. One survey of architectural properties has

1 occurred within project area (a reconnaissance and intensive architectural survey in Grant
 2 County and 11 other counties in order to complete a larger Barns of Northeastern South Dakota
 3 survey project). No properties in the APE have been inventoried. Within one-mile of the project
 4 property, three resources in Big Stone City have been inventoried and evaluated. The Big Stone
 5 City Hall (GT-000-00037) is listed on the NRHP. The Milwaukee Road Bridge O-262½ (GT-
 6 000-0006) at Second Avenue in Big Stone City is considered eligible for listing on the NRHP.
 7 The Big Stone City School (GT-000-00010) has been inventoried and is considered not eligible
 8 for NRHP listing.

9 **Q: Were site visits made to the proposed Big Stone II area?**

10 A: Yes. Once precedent and context were established (we know sites and historic properties
 11 exist in the area) The 106 Group visited the site to evaluate the cultural resources more closely.
 12 A preliminary survey was conducted on site, and field notes and digital photographs were taken
 13 to assist in property evaluation.

14 **Q: Were architectural properties evaluated?**

15 A: Yes. Five architectural properties were identified and evaluated within the APE. Of
 16 these, two were historic, dating from the early to mid 20th century. Buildings on these two
 17 properties were evaluated for eligibility for the NRHP. South Dakota Historic Sites Inventory
 18 Reconnaissance Forms were completed for each architectural history property 49 years in age or
 19 older.

20 **Q: What architectural criteria were considered?**

21 A: Architectural historians evaluated each property's association with historic events or
 22 people, embodiment of a type or architectural distinction, and overall potential to yield important
 23 historic information. These are clearly defined by the National Park Service as:

- 1 • Criterion A – association with the events that have made a significant contribution
- 2 to the broad patterns of our history;
- 3 • Criterion B – association with the lives of persons significant in our past;
- 4 • Criterion C – embodiment of the distinctive characteristics of a type, period, or
- 5 method of construction; representation of the work of a master; possession of high
- 6 artistic values; or representation of a significant and distinguishable entity whose
- 7 components may lack individual distinction; or
- 8 • Criterion D – potential to yield information important to prehistory or history
- 9 (NPS 1995).

10 **Q: What other archeological assessment was done?**

11 A: A walkover assessment (also called a windshield survey in South Dakota) of the project

12 area identified areas of high archaeological potential. Archaeological sites are more likely to

13 occur within 500 ft. (150 m) of an existing or former water source of 40 acres (19 hectares) or

14 greater in extent, or within 500 ft. (150 m) of a former or existing perennial stream; on

15 topographically prominent landscape features; within 300 ft. (100 m) of a previously reported

16 site; or within 300 ft. (100 m) of a former or existing historic structure or feature (such as a

17 building foundation or cellar depression). Archaeologists compared historical documentation,

18 such as plat maps and recent aerial photographs, with current field conditions to assess the

19 potential within the survey area for intact historical archaeological sites.

20 **Q: Did you prepare any written studies/work product that is reflected in the**

21 **Application?**

22 A: Yes.

23 **Q: What were the results of your work?**

1 A: The result of our company's work is a report entitled "Archaeological Assessment and
2 Architectural History Survey for the Big Stone II Project, Big Stone City, Grant County, South
3 Dakota". This report includes an archaeological assessment and an evaluation of all architectural
4 resources within the APE discussed with SD SHPO. It meets the requirements defined by
5 Western in the PA of a Class I archaeological survey and a Class III architectural history survey,
6 unless the APE is expanded. It was submitted to Barr Engineering in May of 2005. Western will
7 develop a comprehensive Historic Properties Treatment Plan based on the results of further
8 survey work, which will be submitted for review comment and consultation to the SD SHPO,
9 Minnesota SHPO, the Tribes, Otter Tail Power Company and all other signatories and consulting
10 parties for review and comment.

11 **Q: What are the cultural resources recommendations for Big Stone Unit II, as reported**
12 **in the 2005 Assessment and Survey and undertaken in the architectural history Class III**
13 **survey?**

14 A: Based on the NRHP criteria, two properties were found to embody a specific type of
15 design, and represent an important historic theme. First, the Rabe Round Barn (GT-004-00001)
16 is recommended as eligible for listing on the NRHP because it embodies the distinctive
17 characteristics of the second stage of round barn building in South Dakota. Second, the Rabe
18 Livestock and Hay Barn (GT-004-00002), is recommended as eligible for listing on the NRHP in
19 the area of architecture because it represents two eras of barn building in South Dakota. There
20 will be insignificant change to view, minimal changes in traffic patterns (largely only during
21 construction), imperceptible increases in noise or vibration, and no change in land use or setting.
22 These recommendations were based largely on the fact that Big Stone Power currently operates a
23 facility immediately adjacent the proposed new BSII. Although these properties are eligible, The

1 106 Group recommended a finding of no adverse effect for the Big Stone II project on the Rabe
 2 Round Barn (GT-004-00001) and the Rabe Livestock and Hay Barn (GT-004-00002).

3 **Q: Might there be an additional level of archaeological survey?**

4 A: Based on direction from Western and on the stipulations of the PA, a Class III
 5 archaeological survey will be undertaken. If any archaeological resources are found upon
 6 additional study, they will be addressed according to the appropriate standards and the
 7 stipulations of the PA.

8 **Q: Did you refer to or rely on other studies or work product in making your evaluation
 9 and/conclusions?**

10 A: Yes. The Archaeological Assessment and Architectural History Survey and my
 11 evaluation and conclusions contained herein are based on information provided by several
 12 previous authors, archaeologists and architectural historians.

13 To make determinations on the eligibility of the historic properties, we looked at:

14 Ahrendt, Steph J.

15 1995 South Dakota's Round and Polygonal Barns and Pavilions National Register of
 16 Historic Places Multiple Property Documentation Form. On file at the South
 17 Dakota Historical Preservation Center, Pierre, South Dakota.

18 Deiber, Camilla R. and Megan Rupnik

19 2005 *Barns of Northeastern South Dakota*. The Louis Berger Group, Inc., Marion,
 20 Iowa. On file at the South Dakota State Historical Preservation Center, Pierre,
 21 South Dakota.

22 Wilhelm, Hubert G. H.

1 1995 Midwestern Barns and their Germanic Connections. In *Barns of the Midwest*,
 2 edited by Allen G. Noble and Hubert G. H. Wilhelm, pp. 62-79. Ohio University
 3 Press, Athens, Ohio

4 Brooks, Allyson and Steph Jacon

5 1994 *Homesteading and Agricultural Development Context*. South Dakota State
 6 Historical Preservation Center, Vermillion, South Dakota.

7 Grant County Historical Society

8 *100 Years in Grant County, South Dakota, 1878-1978*. State Publishing
 9 Company, Pierre, South Dakota.

10 To situate and understand the archaeological context, we looked at:

11 Hanson Engineers Inc.

12 1995 Phase I Cultural Resource Survey, Ortonville-Big Stone Line of Rail
 13 Construction, Grant County, South Dakota, Big Stone City, Minnesota. Copies
 14 available from the South Dakota State Historical Society, Archaeological
 15 Research Center, Rapid City, South Dakota.

16 Johnson, Eldon

17 1975 Archaeological Survey and Testing for the Upstream Work. Big Stone Lake-
 18 Whetstone River Project Area. Submitted to the Department of the Army, St.
 19 Paul District, Corps of Engineers, Contract No. DACW37-75-C-0198. Copies
 20 available from the South Dakota State Historical Society, Archaeological
 21 Research Center, Rapid City, South Dakota.

22 To establish guidelines for making determinations and understand the processes of
 23 evaluation, we looked at:

1 National Park Service

2 1983 Secretary of the Interior's Standards and Guidelines for Archeology and Historic
3 Preservation. *Federal Register* 48(190):44716-44740.

4 1995 *National Register Bulletin 15: How to Apply the National Register Criteria for*
5 *Evaluation*. U.S. Government Printing Office. Washington, D.C.

6 2004 36 CFR 800 Protection of Historic Properties. As amended August 5, 2004.

7 **V. COMPLIANCE WITH REGULATIONS**

8 **Q: Does the Big Stone Unit II comply with all federal, state and local standards and**
9 **regulations relating to cultural resources?**

10 A: Yes, to date. The 106 Group, under contract with Barr Engineering Company for the Big
11 Stone II Co-owners, is in the process of assisting Western in complying with all state and federal
12 standards for archaeology and architectural history surveys. All work to date was conducted in
13 accordance with *Guidelines for Cultural Resource Surveys and Survey Reports in South Dakota*
14 (SHPO 2005), *South Dakota Historic Resource Survey Manual* (SHPO 2000), and *The Secretary*
15 *of the Interior's Standards and Guidelines for Archeology and Historic Preservation* [48 Federal
16 Register 44716-44740] (National Park Service [NPS] 1983). We have and will continue to apply
17 these standards and guidelines to our work.

18 **VI. FUTURE MITIGATION**

19 **Q: What plans are in place if unforeseen cultural resources are discovered during**
20 **construction?**

21 A: As defined in the PA, Western is in the process of developing a Plan for Discovery of
22 Cultural Resources that clearly outlines all necessary steps if unforeseen cultural resources are
23 discovered during construction. Under the initial plan, all work within 200 feet of the find would

1 cease until Western, in consultation with the SHPOs, the Tribes, Otter Tail Power Company and
 2 other PA signatories and consulting parties, provided avoidance, data recovery or mitigation
 3 measures to be undertaken in this case. If human remains are encountered, all work within 200
 4 feet of discovery would cease and the appropriate Federal land managing agency would
 5 implement internal procedures for complying with NAGPRA and South Dakota Codified Law:
 6 34-27-22 through 24-27-28, Human Skeletal Remains and Funerary Objects, Prohibitions and
 7 Notification, the Native American Graves Protection and Repatriation Act.

8 **Q: In the event of accidental release of contaminants, what are the plans to coordinate**
 9 **with officers, pursuant to ARSD 20:10:22:23, regarding the cultural resources and**
 10 **landmarks that have been identified in your study?**

11 A: At the moment there are no known archaeological sites on the plant property, so such
 12 coordination is unnecessary.

13 **Q: Do you have anything further you would like to add to your testimony?**

14 A: Yes. We at The 106 Group Ltd. have done all that we have been required to do as of the
 15 date of the submission of this testimony, and our professional opinion at this time is that there are
 16 no material adverse effects from the proposed Big Stone Unit II regarding any archeological and
 17 architectural historical impacts. We recognize that, subsequent to the submission of this
 18 testimony, and most likely prior to the final hearing for the proposed Big Stone II siting permit
 19 application, we may receive further directive from Western to conduct additional survey work..
 20 Although we do not anticipate uncovering significant cultural resources, should such an event
 21 occur, the appropriate steps would be taken to ensure mitigation.

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

23 A: Yes.

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FOR AN ENERGY CONVERSION FACILITY SITING PERMIT FOR THE

CONSTRUCTION OF THE BIG STONE II PROJECT

DIRECT TESTIMONY

OF

ANDREW SKOGLUND

ACOUSTICAL ENGINEER

BARR ENGINEERING COMPANY

MARCH 15, 2006



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TESTIMONY OF ANDREW J. SKOGLUND

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

2 **DIRECT TESTIMONY OF ANDREW J. SKOGLUND**

3 **I. INTRODUCTION**

4 **Q: Please state your name and business address.**

5 A: Andrew J. Skoglund, 4700 West 77th St., Suite 200, Minneapolis, MN 55435-4803.

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

7 A: I am employed by Barr Engineering Co. as an Acoustical Engineer.

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

9 A: I graduated from Iowa State University in 2004 with a Bachelor of Science degree in
10 Engineering Science with a focus in acoustics. This included studies in the areas of indoor and
11 outdoor acoustics, attenuation and propagation of noise and vibration, finite elements analysis,
12 and non-destructive evaluation. I performed a study of the noise behavior of a commercial
13 blender and options to attenuate its noise, as well as a vibration study of sanding discs.

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

15 A: I started working at Barr Engineering Co. in 2004.

16 **Q: What work experience have you had that is relevant to your testimony?**

17 A: I have been involved in the permitting process for several mining and power industry
18 clients, performing both noise analysis and air quality modeling. I performed noise monitoring
19 for the City of Inver Grove Heights, MN. This involved monitoring the noise levels being
20 emitted from a warehouse facility adjacent to residences. I also modeled future noise effects of
21 Xcel Energy's High Bridge Combined Cycle Project. This involved modeling of a proposed
22 power generation facility in close proximity to residential development. My air quality modeling

1 experience involves primarily Class I dispersion modeling using the CALPUFF suite of
 2 software. I also have some experience running ISC-PRIME and AERMOD.

3 **II. NOISE**

4 **Q: Were you involved in evaluating the potential noise impacts of the proposed Big Stone**
 5 **Unit II?**

6 **A: Yes.**

7 **Q: Please describe your involvement.**

8 **A:** I performed on-site monitoring of existing noise levels around the current Big Stone
 9 facility on June 23 and 24, 2005. I also performed noise modeling of the proposed Big Stone
 10 Unit II, analyzing the potential for impact on surrounding properties.

11 **Q: Did you prepare any particular sections of the Application?**

12 **A:** I prepared Section 4.5.4 of the Application, which reflects the results of the noise
 13 monitoring and noise modeling.

14 **Q: How did you obtain ambient noise levels at the plant site?**

15 **A:** I obtained the existing noise levels at the facility myself, using several calibrated
 16 NoisePro DLX units. These units were placed at four locations around the plant for a 24 hour
 17 period June 23-24, 2005. Locations were chosen to be representative of surrounding receptors.
 18 Noise levels for the proposed equipment were provided by Burns and McDonnell.

19 **Q: Did you consider noise emissions associated with equipment to be used at the site?**

20 **A:** Yes. The noise levels of the equipment that will be part of Big Stone Unit II, used in the
 21 modeling, were provided by Burns and McDonnell. This data consisted of the sound power
 22 levels emitted, divided into octave bands.

23 **Q: How did you estimate future noise levels after Big Stone Unit II is in operation?**

1 A: I analyzed the potential noise levels using the SPM9613 computer model. This model
2 implements the International Standards Organization (ISO) 9613 standard for calculating the
3 propagation and attenuation of outdoor noise. Combination of the modeled results with the
4 existing background was used to give an estimate of the future noise environment.

5 **Q: Will snow machines be utilized in the maintenance of the ponds after Big Stone Unit II is**
6 **in operation?**

7 A: No. Snow machines located on evaporation pond dikes have previously been used to
8 enhance evaporation of water from the plant evaporation pond. This noise source, discussed in
9 Section 4.5.4 of the Application, will be eliminated as part of the Big Stone Unit II construction
10 and associated changes in plant water management.

11 **Q: Are there any federal, state, and local requirements related to noise applicable to Big**
12 **Stone Unit II?**

13 A: There are no specific federal, South Dakota, or local quantitative standards applicable to
14 noise for the Big Stone Unit II site. Minnesota noise standards were used for reference purposes
15 only. The proposed Big Stone Unit II site will comply with the Minnesota noise standards.

16 **Q: What are the results of your evaluation of the potential noise impacts?**

17 A: No significantly greater noise effects are expected from Big Stone Unit II compared to
18 existing conditions. South Dakota has no applicable noise standards. A comparison was made
19 to Minnesota standards, which would apply if the plant were located in Minnesota, and Big
20 Stone Unit II will be in compliance with those standards.

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

22 A: Yes.

23