MPUC Docket No. E-6472/GS-06-668
OAH Docket No. 12-2500-17512-2

BEFORE THE
MINNESOTA OFFICE OF ADMINISTRATIVE HEARINGS

100 Washington Square, Suite 1700
Minneapolis, Minnesota 55401-2138

FOR THE
MINNESOTA PUBLIC UTILITIES COMMISSION

127 7th Place East, Suite 350
St. Paul, Minnesota 55101-2147

In the Matter of a Joint LEPGP Site Permit,
HVTL Route Permit and Pipeline (Partial Exemption)
Route Permit Application for the Mesaba Energy Project

PREPARED DIRECT TESTIMONY AND EXHIBITS OF

EXCELSIOR ENERGY INC., MEP-I LLC, AND MEP-II LLC

THOMAS A. HENNING

JANUARY 16, 2007

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EXCELSIOR ENERGY, INC.

BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION

PREPARED DIRECT TESTIMONY OF

THOMAS A. HENNING

Q Please state your name, current employment position and business address.

A Thomas A. Henning. I am the Senior Air Quality Engineer for Short Elliott Hendrickson Inc. ("SEH"), a consulting firm of engineers, architects, planners with offices in ten states throughout the Upper Midwest and Rocky Mountain regions. I assisted in the preparation of a Prevention of Significant Deterioration ("PSD") air permit application for Phase I and Phase II of the Mesaba Energy Project ("Mesaba One" and Mesaba Two," respectively). My business address is 809 North 8th Street, Suite 205, Sheboygan, Wisconsin 53081-4032.

Q Would you please describe your educational and professional background.

A I have over 20 years experience as an environmental engineer and have worked in a variety of areas including project management, permit negotiations, regulatory compliance and air emission control. I have managed, provided technical direction, or helped complete air operating and construction permit applications for more than 50 facilities. I received a Bachelor of Science in Natural Science in 1984 from St. John's University in Collegeville, Minnesota, and a Masters of Science in Civil Engineering from the University of Minnesota in 1990. I am a licensed Professional Engineer in the State of Minnesota (license number 21828). My resume is appended as Exhibit ___ (TAH-1).

Q On whose behalf are you testifying?

A I am testifying on behalf of MEP-I LLC, MEP-II LLC, and Excelsior Energy Inc. (collectively "Excelsior"), the developers of the Mesaba Energy Project (the "Project").

Scope and Summary

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

A. The purpose of my testimony is to generally describe the Air Emissions Risk Assessment ("AERA") performed for the Mesaba Project. I will also identify the portions of the Joint Application, Environmental Supplement, and Air Permit Application (attached as Appendix 5 to the Joint Application) (the "Applications") which I will sponsor and on which I will be able to provide testimony.

In particular, I am sponsoring the following sections:

Joint Application.

Section 7.4.5 (Class II NAAQS Evaluation)

Section 7.4.6 (Risks to Human Health and Ecology)

Section 8.4.2 (Air Emissions Risk Assessment (AERA))

Environmental Supplement

Section 3.2.5 (Risks to Human Health and Ecology)

Air Permit Application

Section 3.10 (State of Minnesota Requirements)

Appendix E (Air Emissions Risk Analysis)

During the preparation of the Applications, I worked closely with Excelsior in preparing and reviewing these sections. I coordinated the preparation of the AERA and completed the mercury-in-fish assessment portion of the AERA. I also reviewed

and edited draft versions of the AERA. I coordinated the Class II air dispersion modeling and reviewed the Air Permit Application text related to the dispersion modeling. I wrote the initial version of the State of Minnesota Requirements text (Section 3.10) of the Air Permit Application.

Considerations in Determining Whether to Issue a Site Permit for the Project

Q Please describe the potential public health effects due to the estimated air emissions from the Project.

A Class II Ambient Air Quality Standards are set by the federal government to ensure protection of the public health and welfare. Modeling was conducted to determine if emissions from the Project, in conjunction with emissions from both nearby sources and the regional inventory of air emission sources provided by the Minnesota Pollution Control Agency ("MPCA"), would exceed these standards. In the case of Mesaba One and Mesaba Two, the modeling clearly demonstrated that the highest predicted impacts in the analysis due to these sources are far below the applicable standards, and that there are very low impacts of regional sources within their significant area of impact.

In addition, an initial AERA was conducted to determine whether air emissions from the IGCC Power Station could pose an unacceptable health risk to people living or farming nearby, or from eating fish from nearby lakes. The MPCA benchmark for determining whether a facility's emissions present either an acute, sub-chronic, and/or chronic (non-carcinogenic) health risk to nearby residents through inhalation is called a total "hazard index." The total hazard index accounts for the risk due to inhalation of all chemicals of potential concern by a maximally exposed person. The acceptable MPCA total hazard index for chemicals producing a non-carcinogenic effect is 1.0 or

less. For chemicals producing carcinogenic effects, the acceptable MPCA benchmark is a total cancer risk of less than one in 100,000 (10^{-5}) for a maximally exposed person.

The acute and sub-chronic potential hazard indices were predicted at various receptors. The acute and sub-chronic health risks attributable to chemicals producing non-carcinogenic effects are 0.52 and 0.13, respectively, and chronic health risks from non-cancer causing chemicals ranged from 0.032 to 0.0028, all well within the acceptable MPCA total hazard index of 1.0. Cancer risks from all combined facility emission sources and chemicals of potential concern ranged from 2.9×10^{-7} to 3.8×10^{-8}, also well within the MPCA benchmark.

Although mercury deposition from Project emissions have the potential to increase the mercury concentrations in fish populations in nearby lakes, in comparison to the existing hazard quotient for subsistence fishers eating fish from a nearby lake (8.5 to 12.2), the incremental hazard quotient predicted for inputs of mercury from Mesaba One and Mesaba Two is negligible (0.04 to 0.06).

Q Please describe the effects on the natural environment due to the estimated air emissions from the Project.

A Risks to both human health and the environment were calculated for Big Diamond Lake, which is located within three kilometers of the IGCC Power Station Footprint. Portions of Colby Lake are within three kilometers of the East Range Power Station Footprint. Colby Lake is similar in size and approximate distance from the East Range Power Station Footprint as Big Diamond Lake is from the West Range Power Station Footprint. Therefore, the results from the Big Diamond Lake analysis are presumed to be similar to those at Colby Lake.

The results of the analysis conducted for Big Diamond Lake using MPCA's "Local Mercury Assessment" spreadsheet (based on guidance from "Summary for the Fish Consumption Pathway (Local Impacts Assessment): April 7, 2006) indicate that mercury loading to the lake of 0.08 grams per year (g/yr) from the project may occur, in addition to the background mercury loading to the lake of 16.51 g/yr. As noted, the incremental increase in mercury in fish tissue resulting from this loading ranges from 0.002 parts per million (ppm) to 0.003 ppm depending on the size of the fish (compared to 0.39 to 0.56 ppm in fish tissue arising from background mercury levels). The corresponding incremental hazard quotient attributable to Mesaba One and Mesaba Two is predicted to range between 0.04 to 0.06 compared to the hazard quotient attributed to ambient mercury levels which is predicted to range between 8.5 and 12.2.

Q What are the implications of the results from the Fish Consumption modeling studies prescribed by the MPCA?

A The studies predict that the risk to a West or East Range subsistence fisher due to ingestion of fish tissue is increased roughly 0.5% due to the combined mercury emissions from Mesaba One and Mesaba Two. I believe that this result is very conservative given the speciation of mercury expected from the power plant, the capture of mercury expected from the control equipment, and the conservative deposition rate assigned to the predictions.

Q On the basis of your studies, are there any significant adverse human or natural environment effects due to the estimated air emissions from the Project which cannot be avoided?

A No. Based on the Class II dispersion modeling and the AERA, the effects of the air emissions will be well below National and Minnesota Ambient Air Quality Standards set to protect public health (including the health of "sensitive" populations such as asthmatics, children and the elderly) and public welfare (including protection against decreased visibility, damage to animals, crops, vegetation and buildings).

Supplements and Clarifications

Q Are there any parts of the sections that you have sponsored that you would like to supplement or clarify at this time?

A Yes.

Clarifications

Section 3.2.5.1 of the Environmental Supplement states that "Predicted risk associated with the ingestion of fish tissue caught from Big Diamond Lake indicates that the hazard quotient incremental contribution of mercury in fish tissue ranges from 0.45 to 0.65 (dependant on fish size)." This should read " . . . 0.04 to 0.06."

Section 7.4.6.5 of the Joint Application refers to an "incremental increase in the hazard quotient of 0.01 for a subsistence fisher on Big Diamond Lake." The incremental increase in hazard quotient is 0.04 to 0.06, not 0.01. In this same section, the ambient hazard quotient for a subsistence fisher eating fish from Big Diamond Lake should be 8.5 to 12.2, not 1.95 to 2.80.

Supplements

Excelsior has received comments from the MPCA on the initial version of the AERA, which will be addressed through adjusting some of the inputs to the risk model and re-running the model. The results from this additional modeling will be submitted to the MPCA in accordance with permitting rules and regulations. Although the

results from this additional modeling are not expected to cause a significant change in the conclusions presented in the Applications with respect to the health risks posed by air emissions, it is possible that some of the results presented in the Applications and in this testimony will change.

Conclusion

Q Does this conclude your testimony?

A Yes.

EXHIBITS

EXHIBIT ___ (TAH-1)

Thomas A. Henning, PE, CHMM

Senior Air Quality Engineer

Education

Masters of Science
Civil Engineering
University of Minnesota
Minneapolis, Minnesota (1989)

Bachelor of Science
Natural Science
St. John's University
Collegeville, Minnesota (1984)

Professional Registrations

Professional Engineer in Wisconsin, Minnesota, and Nebraska

Certification/Training

Certified Hazardous Materials Manager, Master Level (1997)

ISO 14001 Lead Auditor Training

Professional Memberships

Air and Waste Management Association
Federation of Environmental Technologists

Publications

Coauthor, "Atmospheric Mercury Deposition to Lakes and Watersheds: A Quantitative Reconstruction from Multiple Sediment Cores, "Environmental Chemistry of Lakes and Reservoirs, Baker, L.A. ed., American Chemical Society, Washington, DC, 1994.

Coauthor, "Increasing Rates of Atmospheric Mercury Deposition in Midcontinental North America," Science, Vol 257, pp. 784-787, 1992.

General Background

Twenty years experience as an environmental engineer working in a variety of areas including project management, permit negotiations, regulatory compliance and air emission control. Mr. Henning has managed, provided technical direction, or helped complete air operating and construction permit evaluations and applications for more than 50 facilities. He helps clients obtain expedited construction approvals and helps negotiate permit conditions with regulatory agencies to obtain maximum operational flexibility and manageable reporting requirements.

Experiences

Power and Combustion Related Projects

Mesaba Energy Project, Northern Minnesota – Assisted in the preparation of a Prevention of Significant Deterioration (PSD) air permit application for a new 1200 megawatt coal gasification plant. Tasks included emission calculations, coordinating Class I and Class II modeling, determining state and federal rule applicability, and preparation of an Air Emissions Risk Assessment (human health risk assessment).

PGE/Badger Generating – Southeastern, Wisconsin. Prepared a PSD permit application for a 1080 megawatt natural gas fired electrical generating facility. Two potential sites were evaluated both of which are located within a severe ozone non-attainment area. The application included a LAER analysis for emissions of volatile organic compounds and BACT analysis for pollutants subject to the PSD requirements.

Ispat Inland Steel – East Chicago, Indiana. Prepared PSD permit application for the re-construction of a Blast Furnace. Application included a detailed netting analysis to avoid NSR review for some pollutants. Project was located in an area designated as non-attainment for ozone, sulfur dioxide and particulate matter.

Northern States Power Company (Xcel Energy) – Minneapolis, Minnesota. Assisted in preparation of Best Available Control Technology (BACT) Evaluation for the Black Dog Generating Plant. The project included evaluating the cost and effectiveness of multiple emission control technologies, and identifying BACT determinations made for similar facilities located throughout the United States.

Ispat Inland Steel – East Chicago, Indiana. Evaluated air permitting options for the operation of a coal fired power plant at the Ispat Inland Steel facility. Strategy was to permit the operation of the unit while maximizing offset emission credits that would be available for sale. Worked with a major public utility that considered purchasing the power plant to determine if the plant was economical for their needs.

SEH

Confidential Municipal Utility – Wisconsin. Provided air quality consulting services to a municipal utility that uses diesel fired engines to provide backup power. Reviewed draft Title V permit, evaluated applicability of the recently finalized New Source Performance Standards for diesel engines, and conducted a hazardous air pollutant analysis for the plant.

Wisconsin Paperboard – Milwaukee, Wisconsin. Prepared a construction permit application for a new boiler subject to the 40 CFR 60 Subpart Db (New Source Performance Standard for Industrial-Commercial-Institutional Steam Generating Units). Helped develop NOx continuous emission monitoring and continuous opacity monitoring plan for the unit. Also prepared Title V Air operating permit application for this recycled fiberboard mill.

Medical Waste Incinerators, Stericycle - Chandler, Arizona and Terrell, Texas. Provided air quality engineering for Title V air operating permit applications for a medical waste incinerator in Chandler, Arizona, and another in Dallas, Texas. Coordinating stack testing for NSPS compliance.

BFI Medical Waste Incinerator – Illinois. Prepared a Title V operating permit application for this medical waste incinerator. The facility is subject to the Hospital/Medical/Infections Waste Incinerator rule found in 35 IAC.

Waste Management, Gas to Energy Plants – Wisconsin. Participated in design and permitting landfill gas-fired electrical generation plants at four landfills. The plants used turbine or engine to combust landfill gas and generate electricity. Some of these sites are located in Wisconsin's severe ozone non-attainment area. The applications contained synthetic limits designed to avoid Federal New Source Review requirements. One application included a synthetic limit to reduce nitrogen oxide emissions to below federal Prevention of Significant Deterioration (PSD) requirements. The permit reviews for these projects included significant negotiation with the WDNR staff and participation in public hearings.

Ziegler Power Systems – Minnesota. Obtained a construction and operating permit for a backup power system for a large manufacturing facility located in Minnesota.

Milwaukee Metropolitan Sewerage District – Milwaukee, Wisconsin. Provided on-going air quality services at the Jones Island and South Shore wastewater treatment plants. Services included Title V and construction permit applications, rule applicability evaluations, and other compliance services. Two 16 megawatt turbines are operated at the Jones Island plant. Five reciprocating engines burn digester gas and natural gas at the South Shore plant.

Sludge Incinerator, Green Bay Metropolitan Sewerage District – Green Bay, Wisconsin. Conducted air dispersion modeling, a facility-wide hazardous air pollutant evaluation, and a Title V permit review for this facility. The plant includes two multiple hearth municipal sewage sludge incinerators and associate air pollution control equipment.