Otter Tail Power Company
Update of Minnesota Voluntary Mercury Reduction Initiative
June 2004

I. Background

Otter Tail Power Company has one coal-fired facility in Minnesota. Hoot Lake Plant is 136 MW and is located in Fergus Falls. Although this facility emits less than 50 pounds of mercury per year, we submitted a voluntary plan in order to be proactive in the reduction of mercury emissions in Minnesota.

Otter Tail Power Company has had a history of good stewardship. This is exemplified by some of the mercury reduction activities that were conducted prior to the creation of the voluntary reduction initiative.

- In 1988, Hoot Lake Plant switched from using a lignite coal to a subbituminous coal as a primary fuel. Although both lignite and subbituminous have relatively low concentrations of mercury, the mercury content of the subbituminous coal is about two-thirds the mercury content of lignite. Due to the higher Btu of subbituminous, 25% less fuel was needed to produce the same number of kWh. As a result, subbituminous coal emits approximately half of the mercury produced by lignite.
- Since 1989 bulk mercury has been collected and shipped to mercury recycling facilities. To date, 476 pounds have been recycled.
- Otter Tail Power Company financially contributes to the University of North Dakota Energy and Environment Research Center's Center (EERC) for Air Toxic Metals. Otter Tail Power is a charter member of the group and has financially supported its research since 1992. The Center conducted number of research projects that would support development of new technologies to remove mercury and other toxics from emissions at Big Stone Plant. The Department of Energy's National Energy Technology Laboratory (DOE NETL) provided funding for the projects as part of their mercury reduction program. Finally, Otter Tail Power is contributing to a mercury control technologies study for electric utilities burning lignite coal that is also being conducted by the EERC in cooperation with North Dakota lignite industry. Phase I of the study was $833,000. The DOE National Energy Technology Laboratory has approved additional projects totaling over $12 million.

  Applications for similar testing has been made to the DOE National Energy Technology Laboratory for funding of a full-scale mercury control project at Otter Tail Power Company's Hoot Lake Plant in Fergus Falls, Minnesota. If approved, this project will be conducted in conjunction with other subbituminous coal interests. We are expecting the DOE to decide on the funding award in late 2004.
- Otter Tail Power Company is in the process of phasing out mercury containing switches in communications equipment and SCADA and microwave site mercury relays. As of June 2004 most of the mercury containing equipment has been replaced with the exception of two microwave sites.
- In 2000 and 2001 Otter Tail Power Company partnered with the Otter Tail County and the City of Fergus Falls to reduce the amount of mercury disposed of in the local solid waste stream. During 2001 Otter Tail Power Company donated 576 digital thermometers (cost $1,782) and participated with Otter Tail County in a mercury thermometer collection and swap. About 15 pounds of mercury was collected.

- Education on the proper handling and disposal of mercury containing products is ongoing. In 2001 Otter Tail Power Company participated in electrical contractor training and discussed disposal options with approximately 100 electrical contractors. Spill kits and education in the proper cleanup of mercury spills is part of the mercury reduction program at Hoot Lake Plant.

II. Barriers to Reducing Mercury Emissions

There are currently no viable mercury removal systems for coal burning power plants. Different types of boilers, types of coal, and also emission control equipment affect the quality and the type of emissions. Only through research will effective methods be determined. Researchers have concluded that most of the anthropogenic emissions that fall on Minnesota are from outside the state and even the country and there would be no improvement in the mercury concentrations in the waters of the state if the mercury emissions in Minnesota dropped to zero.

Mercury emissions from subbituminous coal and lignite coal are comparably lower than those from bituminous coal. However, lignite and subbituminous coals release elemental mercury, which is considerably more difficult to collect using conventional emission control equipment.

III. Releases of Mercury

A. Estimate of 1990 Emissions

Based on the fuel used and an estimate of mercury content in the coal burned at Hoot Lake Plant in 1990, the total amount of mercury that contained in the coal that could potentially be emitted was 21.24 pounds. Based on Electric Power Research Institute (EPRI) testing, an emission factor of 0.8 is used to estimate 17.19 pounds emitted to the air in 1990.

B. Mercury content in pounds beginning in 2000.

Calculations are based on amount of fuel used and results of mercury analyses on the coal. These numbers are calculated using the total amount of mercury available in the coal and the EPRI 0.8 emission factor. There are currently no actual test emissions for the Hoot Lake Plant facility.

2000	36.57 pounds to air	
2001	26.81 pounds to air	7.9 pounds to land
2002	32.0 pounds to air	8.9 pounds to land
2003	29.0 pounds to air	7.2 pounds to land

The land application figures are from the TRI reports for those years.

C. Future Projections

As of June 2004, we predict that the emissions for the year 2004 will most likely be lower than those seen in 2003. There was an extended outage on one of the units during May and June 2004, which will impact the total amount of coal burned at Hoot Lake Plant. At this time we do not have any plans to change to the fuel source or the operating schedule.