STATE OF MICHIGAN
Jennifer M. Granholm, Governor

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
Steven E. Chester, Director

AIR QUALITY DIVISION
CONSTITUTION HALL, 525 W ALLEGAN STREET, PO BOX 30260, LANSING MI 48909
INTERNET: http://www.michigan.gov

PUBLIC PARTICIPATION DOCUMENTS

For

Northern Michigan University Ripley Heating Plant
1401 Presque Isle Avenue
Marquette, Michigan

PERMIT APPLICATION NUMBER

60-07

October 19, 2007

Exhibit 5

FACT SHEET

October 19, 2007

Purpose and Summary

The Michigan Department of Environmental Quality (MDEQ), Air Quality Division (AQD), is proposing to act on Permit Application No. 60-07 from Northern Michigan University. The permit application is for the installation and operation of a coal and wood-fired boiler at the Ripley Heating Plant. The proposed project is subject to permitting requirements of the federal and state Prevention of Significant Deterioration (PSD) Regulations. Prior to acting on this application, AQD is holding a 30-day public comment period and a public hearing, if requested, to allow all interested parties the opportunity to comment on the proposed Permit to Install. All relevant information received during the comment period and hearing, if requested, will be considered by the decision-maker prior to taking final action on the application.

Background Information

Northern Michigan University is requesting to install a new coal and wood-fired circulating fluidized bed (CFB) boiler, with a heat input rating of 185 million British thermal units per hour (MMBtu/hr) when firing 100 percent coal and 205 MMBtu/hr when firing 100 percent wood. Another common measure of boiler size is steam output capacity. The proposed boiler will be capable of producing 120,000 pounds of steam per hour. The project will include a steam turbine and generator capable of producing 10 MW (megawatts) gross electrical output.

The circulating fluidized bed is designed to limit emissions to the air. Additional control is to be achieved using a cyclone and fabric filter for particulate matter and selective non-catalytic reduction (SNCR) for oxides of nitrogen as well as a wet-dry mechanical draft cooling tower. The boiler will provide additional steam generation capacity, expanding the reliability and efficiency of the Northern Michigan University combined heat and power facilities. The proposed maximum operating schedule for the CFB boiler is 8,760 hours per year.

The planned location of the proposed CFB boiler is adjacent to the existing Ripley Heating Plant which was constructed in 1966. The most recent upgrade to the Ripley Heating Plant was the replacement of two boilers in 2005. The existing equipment consists of one natural gas/fuel oil-fired boiler operated since 1967, with a maximum capacity of 70,000 pounds steam per hour and two natural gas/fuel oil-fired boilers installed in 2005, each with a maximum capacity of 70,000 pounds steam per hour and utilizing low-nitrogen oxides (NOx) burners and flue gas recirculation for control of emissions of NOx. The heat input rating for each of these existing boilers is 70 MMBtu/hr when firing natural gas and 85 MMBtu/hr when firing oil. Normal operation has consisted of simultaneous operation of one or two of the three boilers, depending on seasonal energy needs, with the third operated as a standby unit. The current permit for the existing boilers restricts emissions to levels less than the rate defined to be a major stationary source.

Key Permit Review Issues

- Emission rates evaluated are based on simultaneous operation of two existing boilers and the proposed CFB boiler.

- The expected mercury emission rate (estimated 5.4 pounds per year) was evaluated by AQD toxicologists. The impacts of this emission may be characterized as minimal and do not raise significant concerns under Michigan Air Pollution Control Rules 228 or 901.

- As proposed, the facility would become a major source under the federal Prevention of Significant Deterioration (PSD) regulations (40 CFR 52.21) and Part 18 of the Michigan Air Pollution Control Rules. The installation of the CFB boiler will increase the potential to emit sulfur dioxide (SO_2) by 125 tons per year and carbon monoxide (CO) by 152.6 tons per year.

- Emissions of SO_2 and NOx from the three existing boilers will be limited to 99.9 tons per year for each pollutant.

- As a major stationary source due to the potential emissions of SO_2, the proposed CFB boiler was evaluated for meeting the best available control technology (BACT) emission limits.

- The proposed CFB boiler is subject to New Source Performance Standards (40 CFR 60), Subparts A and Db. The boiler must meet monitoring, reporting, recordkeeping and testing requirements specified in Subparts A and Db.

- There is sufficient storage area for three days fuel supply. Fuel will be delivered by trucks. Coal will be obtained from one of two utilities, Marquette Board of Power and Light or Wisconsin Energies Presque Isle power plant. Wood will be obtained from independent suppliers. Heavy snowfalls occur on a regular basis in the Upper Peninsula of Michigan, and the short term availability of any of the fuel supplies could be interrupted.

- The combustion of coal in the proposed CFB boiler has the potential to emit toxic air contaminants (TACs) as defined in the Department's Rules for Air Pollution Control and hazardous air pollutants (HAPs) as defined by Section 112(b) of the Clean Air Act Amendments of 1990. Modern state-of-the-art combustion techniques will control the emission of TACs and HAPs and ensure the applicable health based screening levels are not exceeded. Each screening level is established to protect public health.

- Dispersion modeling was performed for emissions of SO_2 from the proposed CFB boiler. Impacts are all below the applicable National Ambient Air Quality Standard and PSD increment. Modeling for TAC and HAP emissions from the boilers shows impacts less than the applicable health based screening levels.

Key Aspects of Draft Permit Conditions

The draft permit conditions include the following to provide safeguards for the public's health and welfare:

- Limits on emissions from the CFB boiler for particulate matter (PM), sulfur dioxide (SO_2), nitrogen oxides (NOx), and carbon monoxide (CO).

- The CFB boiler will be equipped with selective non-catalytic reduction (SNCR) for NOx control and fabric filter for particulate matter control.

- Testing for the following pollutants will be required for the CFB boiler after initial startup:
  - PM, Total PM-10
  - SO_2
  - NOx
  - mercury

- The CFB boiler emissions will be quantified using a continuous emissions monitoring system for emissions of NOx, SO_2, CO_2, and O_2.

- A continuous opacity monitoring system will be required to monitor and record the visible emissions from the CFB boiler.

- Fuel use rates and coal composition will be monitored for the CFB boiler.

- Records of emissions and operating information will be kept on file

Control Technology Review

The applicant is required by federal PSD regulations to demonstrate that it will apply best available control technology (BACT) on all pollutants that are emitted in significant quantities. Northern Michigan University performed a PSD BACT analysis for PM, PM-10/PM-2.5, SO_2, NOx. and CO. The Environmental Protection Agency's (EPA) BACT Clearinghouse database and a separate EPA database of coal fired power plant projects were used to compare emission limits and control options with recent BACT determinations across the nation. The results of the BACT analysis as well as discussions of the emission limits for lead and mercury are presented in the table on page 4.

A secondary impact analysis is required to evaluate impacts relating to soils, vegetation and wildlife, visibility impairment, associated growth, and threatened and endangered species

Soils, Vegetation, and Wildlife--
Typically, impacts of criteria pollutants below the national standards will not result in harmful effects to soils, vegetation and wildlife. Emissions are in compliance with the primary and secondary National Ambient Air Quality Standards (NAAQS) and will have an insignificant impact based on the modeling analysis.

Visibility and Impact to Class 1 areas—

Visibility (opacity) is a function of particulate matter. The nearest Class 1 areas are the Seney National Wildlife Refuge and Isle Royale National Park. Modeling predicts a less than 10% change in the light extinction coefficient at Isle Royale for one day per year using available meteorological data for 2002 and 2003. No adverse effect was predicted using 2004 data.

Growth--
Air quality impacts from the growth resulting from construction and operation of the proposed facility must be assessed. Impacts on the ambient air and surrounding community resulting from the installation of the new CFB boiler, if it is approved, will be minor.

Threatened and Endangered Species—
Correspondence from Michigan Department of Natural Resources and the U.S. Fish and Wildlife Service indicates that there should be no adverse impacts from the proposed project.

Conclusion

Based on the analyses conducted to date, the AQD concludes that the proposed permit will comply with all applicable federal air quality requirements and with all Michigan Department of Environmental Quality, Air Quality Division regulations. It is also staff's conclusion that this project, as proposed, would not violate the federal National Ambient Air Quality Standards. Based on these conclusions, staff has developed draft permit terms and conditions attached to this Fact Sheet which would ensure that the facility design and operation are enforceable and that sufficient monitoring, record-keeping, and reporting will be performed to determine compliance with these terms and conditions. If the permit application is deemed approvable, the delegated decision-maker may determine a need for additional or revised conditions to address issues raised during the public participation process.

If you would like additional information about this proposal, please contact David Riddle of the Air Quality Division Permit Section at 517-373-7081

Control Technology Review Summary Table

Pollutant	Draft Permit 60-07 Emission Limit	Basis for the draft emission limit and additional information
PM	0.03 lb/MMBtu	NSPS (40 CFR 60) Subpart Db allowable limit is 0.10 lb/MMBtu. Emissions are controlled with a cyclone and a fabric filter collector. The BACT emission limit for PM from similar sized boilers ranges from 0.02 to 0.25 lb/MMBtu heat input.
SO_2	0.20 lb/MMBtu (24 hr. avg.) 0.15 lb/MMBtu (30 day avg.)	0.20 lb/MMBtu is the NSPS Subpart Db limit for coal firing. A lower emission limit was met by one facility burning low sulfur coal. The CFB boiler is designed to achieve 92% control of SO_2 emissions by mixing limestone with the coal to react with the SO_2, forming calcium sulfate. A review of control technologies for boilers shows this level of control to be BACT for the process. 0.15 lb/MMBtu allows 100% coal firing for more than 22 days in any 30 day period, or requires the equivalent of more than 7 days of wood fuel to be used during full operation in any 30 day period. A 30 day average facilitates continuous operation during unpredictable interruptions in the availability of a single fuel. Firing wood produces less SO_2 due to a lack of sulfur in the wood. Coal will be limited to 1.5% sulfur. Emissions will be monitored using a continuous emission monitoring system (CEMS).
NOx	0.10 lb/MMBtu	Control using selective non-catalytic reduction (SNCR) which achieves the PSD BACT (40 CFR 52.21(j)) emission rate. The BACT emission limit for NOx from similar boilers ranges from 0.15 to 0.7 lb/MMBtu heat input. Also, the draft limit is well below the NSPS Subpart Db emission limit of 0.60 lb/MMBtu. Emissions will be monitored using a continuous emission monitoring system (CEMS).
CO	0.17 lb/MMBtu	This emission rate represents BACT for CO based on emissions from similar equipment. The reported range of BACT emission limits for CO is 0.022 to 1.8 lb/MMBtu heat input. BACT is good combustion.
lead	1.34 E-05 lb/MMBtu	This emission limit represents 99% control of the estimated potential lead emissions which will be controlled using a fabric filter collector.
mercury	3.0 E-06 lb/MMBtu	The fabric filter collector will reduce the potential mercury emissions. This emission rate (estimated 5.4 pounds per year) was evaluated by AQD toxicologists. The impacts of this emission may be characterized as minimal and do not raise significant concerns under Michigan Air Pollution Control Rules 228 or 901.

STATE AIR REGULATIONS

State Rule	Description of State Air Regulations
R 336.1201	Requires an Air Use Permit for new or modified equipment that emits, or could emit, an air pollutant. However, there are other rules that allow smaller emission sources to be installed without a permit (see Rules 336.1279 through 336.1290 below). Rule 336.1201 also states that the Department can add conditions to a permit to assure the air laws are met.
R 336.1205	Outlines the permit conditions that are required by the federal Prevention of Significant Deterioration (PSD) Regulations and/or Section 112 of the Clean Air Act. Also, the same types of conditions are added to their permit when a plant is limiting their air emissions to legally avoid these federal requirements. (See the Federal Regulations table for more details on PSD.)
R 336.1220	Applies to new "major offset sources" and "major offset modifications" as defined in R 336.1113. This rule contains the permitting requirements for sources located in nonattainment areas that have the potential to emit large amounts of air pollutants. To help the area meet the National Ambient Air Quality Standards (NAAQS), the applicant must install equipment that achieves the Lowest Achievable Emission Rate (LAER). LAER is the lowest emission rate required by a federal rule, state rule, or by a previously issued construction permit. The applicant must also provide emission offsets – which means the applicant must remove more pollutants from the air than the proposed equipment will emit. This can be done by reducing emissions at other existing facilities. As part of its evaluation, the AQD verifies that no other similar equipment throughout the nation is required to meet a lower emission rate and verifies that proposed emission offsets are permanent and enforceable.
R 336.1224	New or modified equipment that emits toxic air contaminants must use the Best Available Control Technology for Toxics (T-BACT). The T-BACT review determines what control technology must be applied to the equipment. A T-BACT review considers energy needs, environmental and economic impacts, and other costs. T-BACT may include a change in the raw materials used, the design of the process, or add-on air pollution control equipment. This rule also includes a list of instances where other regulations apply and T-BACT is not required.
R 336.1225 to R 336.1232	The concentration of each toxic air contaminant present in the outdoor air must be less than specified levels. These levels, called the initial risk screening level (IRSL) for cancer causing air contaminants and the initial threshold screening level (ITSL) for non-cancer causing air contaminants, are health-based standards. Air Quality Division toxicologists develop these standards following the methods in the rules. The standards are designed to protect all humans, including the most sensitive populations such as the young, elderly, and ill.
R 336.1279 to R 336.1290	These rules list equipment to processes that have very low emissions and do not need to get an Air Use permit. However, these sources must meet all requirements identified in the specific rule and other rules that apply.
R 336.1301	Limits how air emissions are allowed to look at the end of a stack. The color and intensity of the color of the emissions is called opacity.
R 336.1331	The particulate emission limits for certain sources are listed. These limits apply to both new and existing equipment.
R 336.1370	Material collected by air pollution control equipment, such as dust, must be disposed of in a manner, which does not cause more air emissions.
R 336.1401 and R 336.1402	Limit the sulfur dioxide emissions from power plants and other fuel burning equipment.
R 336.1601 to R 336.1651	Volatile organic compounds (VOCs) are a group of chemicals found in such things as paint solvents, degreasing materials, and gasoline. VOCs contribute to the formation of smog. The rules set VOC limits or work practice standards for existing equipment. The limits are based upon Reasonably Available Control Technology (RACT). RACT is required for all equipment listed in Rules 336.1601 through 336.1651.
R 336.1702	New equipment that emits VOCs is required to install the Best Available Control Technology (BACT). The technology is reviewed on a case-by-case basis. The VOC limits and/or work practice standards set for a particular piece of new equipment cannot be less restrictive than the Reasonably Available Control Technology limits for existing equipment outlined in Rules 336.1601 through 336.1651.
R 336.1801	Nitrogen oxide emission limits for larger boilers and stationary internal combustion engines are listed.
R 336.1901	Prohibits the emission of an air contaminant in quantities that cause injurious effects to human health and welfare, or prevent the comfortable enjoyment of life and property. As an example, a violation may be cited if excessive amounts of odor emissions were found to be preventing residents from enjoying outdoor activities.
R 336.1910	Air pollution control equipment must be installed, maintained, and operated properly.

STATE AIR REGULATIONS

State Rule	Description of State Air Regulations
R 336.1911	When requested by the Department, a facility must develop and submit a malfunction abatement plan (MAP). This plan is to prevent, detect, and correct malfunctions and equipment failures.
R 336.1912	A facility is required to notify the Department if a condition arises which causes emissions that exceed the allowable emission rate in a rule and/or permit.
R 336.2001 to R 336.2060	Allow the Department to request that a facility test its emissions and to approve the protocol used for these tests.

FEDERAL AIR REGULATIONS

Citation	Description of Federal Air Regulations or Requirements
Section 109 of the Clean Air Act – National Ambient Air Quality Standards (NAAQS)	The United States Environmental Protection Agency has set maximum permissible levels for seven pollutants. These National Ambient Air Quality Standards (NAAQS) are designed to protect the public health of everyone, including the most susceptible individuals, children, the elderly, and those with chronic respiratory ailments. The seven pollutants, called the criteria pollutants, are carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter less than 10 microns (PM10), particulate matter less than 2.5 microns (PM2.5), and sulfur dioxide. Portions of Michigan are currently non-attainment for either ozone or PM2.5. Further, in Michigan, State Rules 336.1225 to 336.1232 are used to ensure the public health is protected from other compounds.
40 CFR 52.21 – Prevention of Significant Deterioration (PSD) Regulations **Best Available Control Technology (BACT)**	The Prevention of Significant Deterioration (PSD) regulations allow the installation and operation of large, new sources and the modification of existing large sources in areas that are meeting the NAAQS. The regulations define what is considered a large or significant source, or modification. In order to assure that the area will continue to meet the NAAQS, the permit applicant must demonstrate that it is installing the Best Available Control Technology (BACT). By law, BACT must consider the economic, environmental, and energy impacts of each installation on a case-by-case basis. As a result, BACT can be different for similar facilities. In its permit application, the applicant identifies all air pollution control options available, the feasibility of these options, the effectiveness of each option, and why the option proposed represents BACT. As part of its evaluation, the Air Quality Division verifies the applicant's determination and reviews BACT determinations made for similar facilities in Michigan and throughout the nation.
40 CFR 60 – New Source Performance Standards (NSPS)	The United States Environmental Protection Agency has set national standards for specific sources of pollutants. These New Source Performance Standards (NSPS) apply to new or modified equipment in a particular industrial category. These NSPS set emission limits or work practice standards for over 60 categories of sources.
Section 112 of the Clean Air Act **Maximum Achievable Control Technology (MACT)** **Section 112g**	In the Clean Air Act, Congress listed 189 compounds as Hazardous Air Pollutants (HAPS). For facilities which emit, or could emit, HAPS above a certain level, one of the following two requirements must be met: 1) The United States Environmental Protection Agency has established standards for specific types of sources. These Maximum Achievable Control Technology (MACT) standards are based upon the best-demonstrated control technology or practices found in similar sources. 2) For sources where a MACT standard has not been established, the level of control technology required is determined on a case-by-case basis.

Notes:

An "Air Use Permit," sometimes called a "Permit to Install," provides permission to emit air contaminants up to certain specified levels. These levels are set by state and federal law, and are set to protect health and welfare. By staying within the levels set by the permit, a facility is operating lawfully, and public health and air quality are protected.

The Air Quality Division does not have the authority to regulate noise, local zoning, property values, truck traffic, or lighting.

These tables list the most frequently applied state and federal regulations. Not all regulations listed may be applicable in each case. In addition, there may be other regulations that must be met. Please refer to the draft permit conditions provided to determine which regulations apply.