MID-MICHIGAN ENERGY
MID-MICHIGAN ENERGY, LLC
c/o LS Power Development, LLC
400 Chesterfield Center, Suite 110
St. Louis, Missouri 63017
(636) 532-2200 · Fax (636) 532-2250

Via Overnight Mail

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AIR QUALITY DIV.

June 30, 2008

Mr. D. John Vial, Sr. Environmental Engineer
Michigan Department of Environmental Quality, Air Quality Division
Constitution Hall
525 West Allegan Street
3rd Floor, North Tower
Lansing, MI 48933

Re: Permit to Install (PTI) Application Number 297-07
Mid-Michigan Energy Station
Midland, Michigan

Dear Mr. Vial:

On June 27, 2008, Mid-Michigan Energy, LLC (MME) met with the Michigan Department of Environmental Quality (MDEQ) to discuss additional items needed for review of the subject PTI application. This information is summarized below.

1. Supplement and provide additional information identified in a MDEQ letter dated June 26, 2008 for the 112(g) maximum available control technology (MACT) evaluation.
2. Supplement and provide additional information regarding the best available control technology (BACT) limit for material handling and transfer point baghouses and vent filters.
3. Supplement and provide additional information regarding the particulate matter (PM) BACT analysis for the auxiliary boiler and steam boilers.
4. Confirm that the project will be defined by fuel heat input and that either boiler technology under consideration (supercritical or ultrasupercritical) can achieve the requested permit limits.
5. Confirm the reducing agent used for nitrogen oxides (NOx) control.

1. 112(g)

A response to MDEQ's request for supplemental information pertaining to the 112(g) analysis as described in the letter dated June 26, 2008 will follow under separate cover.

2. Material Handling Baghouses

A response to MDEQ's request for supplemental information on emission rates for material handing vent filters and baghouses will follow under separate cover.

3. Auxiliary Boiler and Steam Boilers PM BACT

A complete top-down PM BACT for the auxiliary boiler and steam boilers was previously presented in Appendix D, Section D.6.4 of the subject PTI application. This section of the BACT analysis has now been modified to address MDEQ's comments. A redline version, indicating changes, is provided in Attachment 1. A clean version, accepting these changes, is provided in Attachment 2.

4. Boiler Technology and Permit Limits

As detailed in a January 9, 2008 letter to the MDEQ, the Mid-Michigan Energy Station (MMES) will utilize a pulverized coal-fired, dry bottom, once-through steam generator. Main steam conditions shall be a minimum pressure of 3,500 psia and a minimum temperature of 1,050 °F. Reheat steam temperature shall be a minimum of 1,050 °F. Other than the minimum design conditions presented above, MME is unable to commit to a specific boiler type or efficiency at this stage of the project. The final efficiency and boiler type will be chosen after project financing and through a competitive bid process. At that time, boiler type and efficiency will be available. Project financing will occur sometime after issuance of all final permits.

However, it is noted that MME has requested a specific boiler heat input of 6,785 million British thermal units per hour (MMBtu/hr) in the subject PTI application. This heat input will not change irrespective of boiler type and efficiency chosen. MME has requested mass based limits, pounds per hour (lb/hr) and tons per year (tpy), and mass limits based on heat input, lb/MMBtu for all emissions. Therefore, choice of boiler technology does not impact these limits.

Mercury emissions are mass based (lb/hr and tpy); but, the MDEQ has indicated the emission limit will also be mass based on gross generation, pounds per megawatt-hour of gross generation (lb/MWhr-gross). In setting this limit, MME has committed to a worst-case mercury emission permit limit of 15×10^{-6} lb/MWhr (gross), assuming 90% control of input mercury levels[1]. If MME were to use a more efficient boiler than assumed under the worse case, the mercury emission rate on a lb/MW-hr (gross) level would be slightly lower but the mass emission rate (lb/hr and tpy) would remain unchanged since the heat input to the boiler would remain unchanged from 6,785 MMBtu/hr.

5. NOx Control Reducing Agent

MME commits to the use of aqueous ammonia for NOx control in the SCR unit.

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[1] It is noted that 90% removal of mercury based on input mercury levels is consistent with the proposed Michigan mercury rule (Part 15. Emission Limitations and Prohibitions – Mercury).

Please contact me at (636) 532-2200 or via email at dmulvey@lspower.com if you have questions on this submittal. Can you also please provide written confirmation that the listed five items accurately reflect the information being sought by the MDEQ and that Items #3, #4, and #5 have been satisfied by this submittal?

Very truly yours,

Douglas Mulvey, P.E.
Environmental Engineer

Cc: Bill Presson, MDEQ, via email
Julie Brunner, MDEQ, via email
Janet Vanderpool, MME, via email
Bruce Goodman, VRSH, via email

Enclosures: as noted

ATTACHMENT 1

D.6.4 Particulate Matter (PM/PM_{10})

Filterable particulate matter emissions depend predominantly on the grade of fuel fired. Natural gas contains only trace amounts of ash. The use of other fuels such as fuel oil would be accompanied by higher fuel ash contents.

Step 1 – Identify All Control Technologies

A listing of potential control technologies is provided below.

Lower Emitting Processes/Practices

Lower emitting processes/practices for control of PM/PM_{10} emissions are pre-combustion technologies that have the potential to result in lower levels of particulate formation. Lower emitting processes/practices include the following:

Fuel Selection

Natural gas has the lowest ash content of any of the fossil fuels.

Add-On Controls

Due to the use of natural gas, the PM/PM_{10} concentration in the boiler exhaust will be extremely low. Add on control devices such as fabric filters, electrostatic precipitators (ESPs), and scrubbers are not technically feasible for this application because of the high operating temperatures, high volumes of airflow, fine PM distribution, and very low PM emission rates. Based on availability and applicability, add-on control technology was eliminated from consideration due to technical infeasibility for practical use for small auxiliary and steam boilers.

Based on a review of the RBLC database, permits for other power plants, and discussions with vendors, no add-on PM/PM_{10} controls have been installed on a boiler firing natural gas, and no add-on controls have been demonstrated as available for reducing emissions below these baseline emissions level. Thus, consistent with EPA guidance,[2] add-on controls are not considered in this analysis.

Deleted: Due to the use of natural gas, the PM/PM_{10} concentration in the boiler exhaust will be extremely low.

Step 2 – Eliminate Technically Infeasible Options

In this step, the potentially applicable particulate control technologies identified in Step 1 are each evaluated for technical feasibility. Fuel selection (i.e., the use of natural gas) is widely used to minimize PM/PM_{10} emissions and is considered technically feasible.

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[2] U.S. EPA, *New Source Review Workshop Manual (Draft)*, 1990, p. B.73. The example illustrates that EPA does not expect analysis of add-on controls when the emission rate with a clean-burning fuel is on the same order as other sources controlled with stringent add-on controls.

Step 3 – Rank Remaining Control Technologies by Effectiveness

Step 3 of the top-down process includes a ranking of the control technologies by effectiveness and a listing of the energy, environmental, and economic impacts for each technology. The elements of the analysis are presented below.

Ranking by Control Effectiveness

Fuel selection is the only remaining feasible control technology.

Table D.29 ranks the feasible particulate control technologies by effectiveness when applied to the Facility.

Table D.1 - Ranking of Particulate Control Technologies by Effectiveness

Control Technology	Control Effectiveness (lb/MMBtu) (1)
Fuel Selection: Natural Gas	5.0×10^{-3}

Notes:
(1) Represents filterable particulate as measured using EPA Method 5.

Energy Impacts

Natural gas has a heating value of 20,000 Btu/lb and does not present any energy impacts.

Environmental Impacts

Natural gas will be delivered to the site via a pipeline. No storage tanks are involved and no environmental impacts are expected.

Economic Impacts

Although natural gas may present a higher cost than lower-grade distillate fuels, economic impacts are not calculated since natural gas is considered the base case.

Step 4 – Evaluate Most Effective Controls and Document Results

The potential energy, environmental, and economic impacts of the control technologies are evaluated below, starting with the most effective control.

Energy Impacts

There are no energy impacts that preclude the selection of natural gas as PM/PM_{10} BACT.

Environmental Impacts

There are no environmental impacts that preclude the selection of natural gas as PM/PM_{10} BACT.

Economic Impacts

There are no economic impacts that preclude the selection of natural gas as PM/PM_{10} BACT.

Since there are no energy, environmental, or economic impacts that preclude the use of natural gas, this technology is selected as PM/PM_{10} BACT for the Main Auxiliary Boiler and three Steam Boilers.

Step 5 – Select BACT

Based on the preceding analysis, BACT for PM/PM_{10} emission control is the use of natural gas with a total emission limit of 5×10^{-3} lb/MMBtu, on a 3-hour average basis.

ATTACHMENT 2

D.6.4 Particulate Matter (PM/PM_{10})

Filterable particulate matter emissions depend predominantly on the grade of fuel fired. Natural gas contains only trace amounts of ash. The use of other fuels such as fuel oil would be accompanied by higher fuel ash contents.

Step 1 – Identify All Control Technologies

A listing of potential control technologies is provided below.

Lower Emitting Processes/Practices

Lower emitting processes/practices for control of PM/PM_{10} emissions are pre-combustion technologies that have the potential to result in lower levels of particulate formation. Lower emitting processes/practices include the following:

Fuel Selection

Natural gas has the lowest ash content of any of the fossil fuels.

Add-On Controls

Due to the use of natural gas, the PM/PM_{10} concentration in the boiler exhaust will be extremely low. Add on control devices such as fabric filters, electrostatic precipitators (ESPs), and scrubbers are not technically feasible for this application because of the high operating temperatures, high volumes of airflow, fine PM distribution, and very low PM emission rates. Based on availability and applicability, add-on control technology was eliminated from consideration due to technical infeasibility for practical use for small auxiliary and steam boilers.

Based on a review of the RBLC database, permits for other power plants, and discussions with vendors, no add-on PM/PM_{10} controls have been installed on a boiler firing natural gas, and no add-on controls have been demonstrated as available for reducing emissions below these baseline emissions level. Thus, consistent with EPA guidance,[3] add-on controls are not considered in this analysis.

Step 2 – Eliminate Technically Infeasible Options

In this step, the potentially applicable particulate control technologies identified in Step 1 are each evaluated for technical feasibility. Fuel selection (i.e., the use of natural gas) is widely used to minimize PM/PM_{10} emissions and is considered technically feasible.

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[3] U.S. EPA, *New Source Review Workshop Manual (Draft)*, 1990, p. B.73. The example illustrates that EPA does not expect analysis of add-on controls when the emission rate with a clean-burning fuel is on the same order as other sources controlled with stringent add-on controls.

Step 3 – Rank Remaining Control Technologies by Effectiveness

Step 3 of the top-down process includes a ranking of the control technologies by effectiveness and a listing of the energy, environmental, and economic impacts for each technology. The elements of the analysis are presented below.

Ranking by Control Effectiveness

Fuel selection is the only remaining feasible control technology.

Table D.29 ranks the feasible particulate control technologies by effectiveness when applied to the Facility.

Table D.2 - Ranking of Particulate Control Technologies by Effectiveness

Control Technology	Control Effectiveness (lb/MMBtu) (1)
Fuel Selection: Natural Gas	5.0×10^{-3}

Notes:
(1) Represents filterable particulate as measured using EPA Method 5.

Energy Impacts

Natural gas has a heating value of 20,000 Btu/lb and does not present any energy impacts.

Environmental Impacts

Natural gas will be delivered to the site via a pipeline. No storage tanks are involved and no environmental impacts are expected.

Economic Impacts

Although natural gas may present a higher cost than lower-grade distillate fuels, economic impacts are not calculated since natural gas is considered the base case.

Step 4 – Evaluate Most Effective Controls and Document Results

The potential energy, environmental, and economic impacts of the control technologies are evaluated below, starting with the most effective control.

Energy Impacts

There are no energy impacts that preclude the selection of natural gas as PM/PM_{10} BACT.

Environmental Impacts

There are no environmental impacts that preclude the selection of natural gas as PM/PM_{10} BACT.

Economic Impacts

There are no economic impacts that preclude the selection of natural gas as PM/PM_{10} BACT.

Since there are no energy, environmental, or economic impacts that preclude the use of natural gas, this technology is selected as PM/PM_{10} BACT for the Main Auxiliary Boiler and three Steam Boilers.

Step 5 – Select BACT

Based on the preceding analysis, BACT for PM/PM_{10} emission control is the use of natural gas with a total emission limit of 5×10^{-3} lb/MMBtu, on a 3-hour average basis.