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DEPARTMENT OF ENVIRONMENTAL QUALITY  
LANSING



KEITH CREAGH  
DIRECTOR

January 12, 2016

Dr. Susan Hedman, Administrator  
United States Environmental Protection Agency  
Region 5  
77 West Jackson Boulevard (R-19J)  
Chicago, Illinois 60604-3507

Dear Dr. Hedman:

The Michigan Department of Environmental Quality (MDEQ) submits for your approval the enclosed State Implementation Plan (SIP) for the Five-Year Regional Haze Progress Report as required by Section 169 of the federal Clean Air Act and the United States Environmental Protection Agency's Regional Haze Program.

The Progress Report documents the State's determination that its current Regional Haze SIP is adequate and requires no further revision at this time to achieve 2018 visibility goals for the Michigan Class I areas, Isle Royale National Park and Seney National Wildlife Refuge.

If you have any questions regarding this matter, please contact Ms. Lynn Fiedler, Chief, Air Quality Division, at 517-284-6773; [fiedlerl@michigan.gov](mailto:fiedlerl@michigan.gov); or MDEQ, P.O. Box 30260, Lansing, Michigan 48909-7760; or you may contact me.

Sincerely,

Keith Creagh  
Director  
517-284-6700

Enclosure

cc/enc: Mr. Rob Kaleel, Lake Michigan Air Directors Consortium  
Mr. Jim Sygo, Chief Deputy Director, MDEQ  
Ms. Lynn Fiedler, MDEQ  
Mr. Robert Irvine, MDEQ

# Five-Year Regional Haze Progress Report State Implementation Plan



Michigan Department of Environmental Quality  
Air Quality Division  
P.O. Box 30260  
Lansing, Michigan 48909-7760

January 12, 2016

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## **EXECUTIVE SUMMARY**

The Clean Air Act (CAA) §169A and B requires the protection of visibility in 156 federal Class I areas. The United States Environmental Protection Agency's (USEPA) 1999 Regional Haze Rule, Title 40 Code of Federal Regulations (CFR) 51.308, requires states to develop and implement State Implementation Plan (SIP) revisions to reduce visibility impairment resulting from "manmade air pollution" or regional haze.

The Michigan Department of Environmental Quality (MDEQ) submitted its Regional Haze SIP on November 5, 2010. The USEPA approved the State of Michigan's (State) Regional Haze SIP on January 3, 2013, as satisfying all applicable requirements, except for Best Available Retrofit Technology (BART) emission limits for the St. Marys Cement, Escanaba Paper Company, and Tilden Mining Company (TMC) facilities. Federal Implementation Plans (FIPs) were issued for these facilities.

The Regional Haze Rule also requires states to provide interim progress reports outlining the status of required Regional Haze SIP elements, due five years after submittal of each state's initial Regional Haze SIP. The State submits this five-year progress report to evaluate implementation of the SIP requirements and the resulting emissions reductions and visibility improvements. The report documents the State's determination that its current Regional Haze SIP is adequate and requires no further revision at this time to achieve 2018 visibility goals.

## **INTRODUCTION**

### **Michigan's Regional Haze SIP**

The State is home to two federal Class I areas: Isle Royale National Park (Isle Royale) located on Lake Superior and Seney National Wildlife Refuge (Seney) located in Michigan's Upper Peninsula.

The State's Regional Haze SIP calculated baseline and natural visibility conditions for these areas, established reasonable progress goals (RPGs) for them, provided BART determinations, adopted a long-term strategy supporting progress towards visibility goals, and documented consultation with other states and federal land managers (FLMs) in developing its plan.

The State's SIP relies on emission reductions from what are referred to as "on the books" controls. These are control programs that are already in place or soon will be. This includes the Cross-State Air Pollution Rule (CSAPR), which the USEPA determined to be "better than BART" for electric-generating units (EGUs). Legal challenges to the rule postponed implementation, though the United States Supreme Court upheld the rule and issued administrative actions to formally implement CSAPR beginning in 2015. Other "on the books" controls include federally-mandated reductions at Lafarge Midwest, Inc. – Alpena Plant (Lafarge), BART control programs at four other non-EGU facilities, and several federal programs affecting both on-road and off-road mobile sources.

### **Five-Year Progress Report**

The Regional Haze Rule requires states to submit a SIP revision to the USEPA every five years evaluating progress toward the reasonable progress goals for each Class I area within the state and each Class I area located outside the state which may be affected by emissions from within the state (40 CFR 51.308(g)). The Regional Haze Rule also requires the State to determine

adequacy of its existing Regional Haze SIP (40 CFR 51.308(h)). This document fulfills the applicable requirements of the five-year progress report, and the State has determined that the State's current Regional Haze SIP is adequate and requires no further substantive revision at this time to achieve 2018 reasonable progress goals.

### **Summary of Progress Report Elements**

This Progress Report was assembled using the April 2013 USEPA regional haze progress reports guidance ("General Principles for the five-year Regional Haze Progress Reports for the Initial Regional Haze State Implementation Plans (Intended to Assist States and USEPA Regional Offices in Development and Review of the Progress Reports)," USEPA, OAQPS, April 2013). The sections of the report follow the listed required elements in the guidance document.

Summaries of each element in the five-year progress report follow.

#### **Status of Control Strategies in the Regional Haze SIP**

This element of the Progress Report is intended to give a qualitative description of the status of each of the emission reduction strategies in the original Regional Haze SIP. To summarize, controls identified in the State's Regional Haze SIP have either been implemented or are expected to be implemented by 2018. Emission reductions are also being achieved by other mechanisms than the Regional Haze SIP, such as the FIPs addressing three of the State's BART sources.

#### **Emissions Reductions from Regional Haze SIP Strategies**

This element of the Progress Report is intended to give a quantitative description of the emission reductions being achieved by sources addressed in the Regional Haze SIP. Though some of the Regional Haze SIP strategies have not produced quantifiable emission reductions to date, Michigan sulfur dioxide (SO<sub>2</sub>) and nitrogen dioxide (NO<sub>x</sub>) emissions are consistently decreasing.

#### **Visibility Progress**

This element of the Progress Report provides a description of the improvement in visibility being monitored for the two Class I areas. Both of the State's Class I areas have seen improvements in worst-day visibility conditions. The 2018 reasonable progress goals for Isle Royale and Seney have already been achieved, with the monitored values being well below goals, based on 2013 monitoring data for the 20% worst visibility days.

#### **Emissions Progress**

This element of the Progress Report provides a description of the overall reduction in SO<sub>2</sub> and NO<sub>x</sub> in the State's inventory. The data further demonstrates that sources are achieving significant emission reductions necessary to bring visibility impacts below the RPG.

## **Assessment of Changes Impeding Visibility Progress**

This element of the Progress Report provides an indication on whether conditions may change to impede the progress currently being made in improving the visibility at the two Class I areas. The State does not currently anticipate any significant changes in either in-state or out-of-state emissions that would impede visibility progress.

## **Assessment of Current Strategy**

This element of the Progress Report provides a final conclusion on the ability of the existing Regional Haze SIP and related control programs to achieve the 2018 visibility goals at the two Class I areas, or whether more needs to be done. Based on emission reductions already achieved and reasonable progress goals and the anticipation of further emissions reductions, the State believes its current Regional Haze SIP strategy to be sufficient.

## **Review of Visibility Monitoring Strategy**

The State continues to rely upon participation in the Interagency Monitoring of Protected Visual Environments (IMPROVE) Program to meet its monitoring strategy requirements with no modifications to the strategy determined necessary at this time.

## **Determination of Adequacy**

The State makes a negative declaration, per the USEPA guidance, that further revision of the existing implementation plan is not needed at this time.

## **STATUS OF CONTROL STRATEGIES IN THE REGIONAL HAZE SIP**

### **Haze SIP Control Measures/Limits and Status**

#### **Non-EGU BART-Subject Sources**

Five non-EGU sources in the State were identified in the 2010 Regional Haze SIP submittal as being subject to BART. These sources are evaluated below in terms of Haze SIP control measures/limits and status relative to compliance deadlines. This part also describes how three of the five State BART sources are now required to apply additional or more stringent controls beyond those required in the Michigan BART determinations due to USEPA disapprovals of the State BART determinations and issuance of FIPs.

#### **Lafarge Midwest, Inc. – Alpena Plant**

A Consent Decree between Lafarge Midwest, Inc., the United States, the State of Michigan and other states and jurisdictions (USA, USEPA, Michigan, *et al.* v. Lafarge; U.S. District Court Civil Action No. 3:10-cv-00044-JPG-CJP) was entered March 18, 2010, requiring NO<sub>x</sub> and SO<sub>2</sub> control for the Alpena plant and other Lafarge plants. A copy of the Consent Decree is available at: [http://yosemite.epa.gov/r5/r5ard.nsf/6a2817f3f71298e28625759a0045ba96/568e7b286ddc865c8625785d0062c24d/\\$file/lafarge%20consent%20decree%20as%20entered.pdf](http://yosemite.epa.gov/r5/r5ard.nsf/6a2817f3f71298e28625759a0045ba96/568e7b286ddc865c8625785d0062c24d/$file/lafarge%20consent%20decree%20as%20entered.pdf).

The Consent Decree allowed Lafarge to apply NO<sub>x</sub> and SO<sub>2</sub> control or to retire or replace any of their five kilns according to a specified schedule to achieve specified facility-wide tons per year limits. The control program also set demonstration-phase facility-wide, 12-month rolling limits of 4.89 pounds NO<sub>x</sub> per ton of clinker and 3.68 pounds SO<sub>2</sub> per ton of clinker for a period during which individual limits were also to be set for each kiln based on emission testing. These Consent Decree requirements had previously been accepted as BART in the 2010 Regional Haze SIP submittal.

Lafarge opted to install selective non-catalytic reduction (SNCR) NO<sub>x</sub> control on each kiln, along with dry absorbent addition (DAA) for SO<sub>2</sub> control on Kilns 19, 20, 21 and wet flue gas desulfurization (FGD) SO<sub>2</sub> control on Kilns 22 and 23. The limits and other requirements of the Consent Decree and the selected SO<sub>2</sub> and NO<sub>x</sub> control systems were incorporated in the State Permit to Install (PTI) No. 195-10B (copy attached as Appendix A), issued on September 13, 2013.

The interim facility-wide, 12-month rolling limits of the Consent Decree are listed below. Annual actual facility-wide emission rates for 2011 (6,907 tons per year NO<sub>x</sub> and 10,905 tons per year SO<sub>2</sub>) were well below the Consent Decree 2011 interim 12-month rolling limits.

Consent Decree Deadlines/Limits - USA, USEPA, Michigan, *et al.* v. Lafarge; U.S. District Court Civil Action No. 3:10-cv-00044-JPG-CJP:

**NO<sub>x</sub>**

Interim Limit (facility-wide 12-month rolling): 8,650 tons by January 1, 2011

Install SNCR Control on 3 KG5 Kilns by December 1, 2011

Install SNCR Control on 2 KG6 Kilns by January 1, 2012

**SO<sub>2</sub>**

Interim Limit (facility-wide 12-month rolling): 13,100 tons by January 1, 2011

Install DAA Control on 3 KG5 Kilns by March 1, 2014

Install Wet FGD on 2 KG6 Kilns by March 1, 2014

Compliance Status: Current status as of September 4, 2015, listed in the Michigan Air Compliance and Enforcement System (MACES), indicates compliance with applicable permits (which include the Consent Decree requirements) and Michigan rules. Also, no current enforcement action was found in MACES.

The control measures noted in the above description are summarized in Table 1, which includes the five State BART sources.

**Escanaba Paper Company (referenced in State 2010 Regional Haze SIP Submittal as New Page)**

The 2010 Regional Haze SIP submittal indicated that the State had accepted Escanaba Paper Company's existing particulate matter (PM), NO<sub>x</sub>, and SO<sub>2</sub> emission limits as representing BART for their subject equipment. The USEPA later issued a final rule effective on January 3, 2013, disapproving the portion of the State's Regional Haze SIP that applied to the BART determination for Escanaba Paper Company's Boilers 8 and 9. The final rule also included a FIP for Escanaba Paper Company's Boilers 8 and 9 that imposed NO<sub>x</sub> BART limits.

The *Federal Register* publication of the USEPA disapproval action and the FIP can be accessed at: <http://www.gpo.gov/fdsys/pkg/FR-2012-12-03/pdf/2012-29014.pdf>.

The USEPA noted in their final rulemaking that Escanaba Paper Company had already implemented improvements in combustion control for its boilers and that the limits in the FIP required that the current levels of NO<sub>x</sub> control be maintained.

The Boiler 8 NO<sub>x</sub> limit was changed by the USEPA to a fixed, rolling 30-day average limit of 1.35 pound (lb.) of NO<sub>x</sub> per million British Thermal Units (MMBtu), rather than a weighted average of separate limits for oil firing and gas firing. A continuous emission monitor (CEM) system was the required means of compliance determination for Boiler 8. The Boiler 9 NO<sub>x</sub> limit was set by the FIP at 0.27 lb per MMBtu with compliance determination by means of emission testing.

Compliance Status: Most recent inspection on September 3, 2014, Escanaba Paper was determined to be in compliance with MI-ROP-A0884-2008a and the Air Pollution Control Rules. Current status as of September 4, 2015, in MACES indicates compliance with applicable permits, Michigan Rules, and the FIP. No current enforcement action was found in MACES.

The control measures noted in the above description are summarized in Table 1, which includes the five State BART sources.

### **St. Marys Cement**

The State's 2010 Regional Haze SIP indicated that the State had accepted the St. Marys Cement existing permitted PM, NO<sub>x</sub>, and SO<sub>2</sub> emission limits as representing BART for their subject equipment. The USEPA later issued a final rule effective on January 3, 2013, disapproving the portion of the State's Regional Haze SIP that applied to the NO<sub>x</sub> and SO<sub>2</sub> BART determination for the cement kiln and associated equipment at St. Marys Cement. The final rule also included a FIP for this equipment that imposed NO<sub>x</sub> and SO<sub>2</sub> BART limits. The *Federal Register* publication of the USEPA disapproval action and FIP can be accessed at: <http://www.gpo.gov/fdsys/pkg/FR-2012-12-03/pdf/2012-29014.pdf>.

The USEPA noted in their final rulemaking that their BART determination for the facility includes operation of SNCR and a 50% reduction in NO<sub>x</sub> emissions. The following NO<sub>x</sub> emission limits were set in the FIP effective January 1, 2017, along with testing, monitoring, recordkeeping, and reporting requirements:

2.80 lbs NO<sub>x</sub> per ton of clinker (30-day rolling average as NO<sub>2</sub>); and 2.40 lbs NO<sub>x</sub> per ton of clinker (12-month average as NO<sub>2</sub>); 7.50 lbs SO<sub>2</sub> per ton of clinker (12-month average).

The USEPA also concluded in the rulemaking that add-on SO<sub>2</sub> control was not warranted as BART set an SO<sub>2</sub> limit of 7.5 lbs per ton of clinker.

The current limits in the facility's Renewable Operating Permit (ROP) are higher for NO<sub>x</sub> : 6.50 lbs per ton of clinker monthly average (May through September); and 7.67 lbs per ton of clinker monthly average (October through April). The SO<sub>2</sub> limits are 2,800 lbs per hour, 550 tons per month, and 4,404 tons per year limits. The ROP has since been modified to add a requirement specifying that St. Marys Cement must comply with applicable BART requirements effective January 1, 2017. The State will re-open the ROP to incorporate the specific FIP BART requirements into the ROP at that time.

Compliance Status: Most recent inspection on September 10, 2014, St. Marys Cement was determined to be in compliance with MI-ROP-B1559-2014. No current enforcement action was found in MACES.

The control measures noted in the above description are summarized in Table 1, which includes the five State BART sources.

#### **Smurfit Stone Container Corporation**

The State 2010 Regional Haze SIP indicated that the Smurfit Stone Container Corporation plant had been shut down since February 2010. The company was listed as American Iron & Metal (SRN A5754) in the Michigan Air Emissions Reporting System (MAERS) as of 2004. No emissions were recorded in MAERS after 2010 and no active permits for the facility were found in the Michigan records of PTIs and ROPs. A report of an MDEQ inspection on August 27, 2010, indicates the mill had been closed since the Autumn of 2009. The Smurfit-Stone Ontonagon Mill was sold to Rock-Tenn Company effective May 27, 2011. The name of the new company will be RockTenn CP, LLC, per a note in the MACES filed by the State District staff. No new air permits were found in the Michigan permit system for the new owner.

As expected, there have been no reported emissions since the shutdown reported for late 2009 or early 2010.

The control measures noted in the above description are summarized in Table 1, which includes the five State BART sources.

#### **Tilden Mining Company, LLC (TMC)**

The State 2010 Regional Haze SIP indicated that the State had accepted the TMC existing permitted PM emission limits based on the taconite Maximum Achievable Control Technology (MACT) as representing BART for the indurating furnace/grate-kiln (EUKILN1), EU PRIMARY CRUSHER, EU COOLER 1, EU DRYER 1, EU BOILER 1, and EU BOILER 2. The SIP submittal also accepted the TMC cost analysis showing that all technically feasible SO<sub>2</sub> control measures evaluated as BART were not cost-effective. Finally, the State's SIP submittal accepted a TMC proposal to set a BART NO<sub>x</sub> limit for the indurating furnace/grate-kiln (EUKILN1) before December 31, 2012, based on "good combustion practices" and emission testing.

The USEPA subsequently issued a final rule effective on March 8, 2013, that specified a FIP for certain equipment that imposed NO<sub>x</sub> limits for the indurating furnace/grate-kiln (EUKILN1). The *Federal Register* publication of the USEPA disapproval action and FIP can be accessed at: <http://www.gpo.gov/fdsys/pkg/FR-2013-02-06/pdf/2013-01473.pdf>. After subsequent litigation, a settlement was entered in April, 2015. The indurating furnace NO<sub>x</sub> limits were revised as shown below. These changes to the limits were included in the proposed FIP Rule that was published in the *Federal Register* on October 22, 2015.

The indurating furnace NO<sub>x</sub> limits based on the proposed FIP Rule will be 2.8 lbs NO<sub>x</sub>/MMBtu, based on a 720-hour rolling average, when burning natural gas, and 1.5 lbs NO<sub>x</sub>/MMBtu, based on a 720-hour rolling average, when burning coal or a mixture of coal and natural gas. The limits apply beginning 60 months from the effective date of the revised FIP. According to the USEPA, to meet these limits, the furnace will need to be equipped with low NO<sub>x</sub> burners. In accordance

with the settlement, TMC has the opportunity to assess the impact of the controls and process changes on product quality and propose revised limits for approval by the USEPA.

The FIP also sets SO<sub>2</sub> limits:

*(2) SO<sub>2</sub> Emission Limits. A fuel sulfur content limit of no greater than 1.20 percent sulfur content by weight shall apply to fuel combusted in Process Boiler #1 (EUBOILER1) and Process Boiler #2 (EUBOILER2) beginning three months from March 8, 2013. A fuel sulfur content limit of no greater than 1.50 percent sulfur content by weight shall apply to fuel combusted in the Line 1 Dryer (EUDRYER1) beginning 3 months from March 8, 2013...*

*(3) The owner or operator of the Tilden Grate Kiln Line 1 furnace shall meet an emission limit of 500 lbs SO<sub>2</sub>/hr based on a 30-day rolling average beginning six months after [EFFECTIVE DATE OF FINAL RULE]... The Tilden Grate Kiln Line 1 furnace shall not be limited to natural gas fuel... EPA may adjust the 500 lbs/hr SO<sub>2</sub> limit downward to reflect the calculated SO<sub>2</sub> emission rate; however, EPA will not increase the SO<sub>2</sub> limit above 500 lbs/hr.*

Another separate Final Rule was published October 1, 2013, in the *Federal Register* disapproving the portions of the State Regional Haze SIP related to BART for TMC. The *Federal Register* publication of the USEPA disapproval action can be accessed at: <http://www.gpo.gov/fdsys/pkg/FR-2013-09-30/pdf/2013-23394.pdf>.

Compliance Status: Most recent inspection on September 23, 2014, TMC was determined to be in compliance with MI-ROP-B4885-2008a and PTI 148-12A. The FIP NO<sub>x</sub> limits are not yet applicable. No current enforcement action was found in MACES. The control measures noted in the above description are summarized in Table 1, which includes the five State BART sources.

**TABLE 1  
UPDATE OF BART CONTROL REQUIREMENTS**

Source Name	SO <sub>2</sub> BART Controls	NO <sub>x</sub> BART Controls	Comments
Lafarge Midwest, Inc.	DAA for SO <sub>2</sub> control on Kilns 19, 20, 21 (due by March 1, 2014) Wet FGD SO <sub>2</sub> control in Kilns 22 and 23 (due by March 1, 2014)	SNCR NO <sub>x</sub> control on each of five kilns (due by January 1, 2012)	Consent decree NO <sub>x</sub> interim limit (facility-wide 12-month rolling): 8,650 tons, applies January 1, 2011. Consent decree NO <sub>x</sub> SO <sub>2</sub> interim limit (facility-wide 12-month rolling): 13,100 tons, applies January 1, 2011.
Escanaba Paper Company (previously New Page) No. 8 Boiler	Existing operation with natural gas and residual oil	Improvements in combustion control already implemented; limits in the FIP require that the current levels of NO <sub>x</sub> control be maintained. Existing flue gas recirculation system considered an additional option for meeting NO <sub>x</sub> limit specified in the FIP.	MI Reg. Haze SIP proposed existing controls as BART for Boiler 8. USEPA disapproved of NO <sub>x</sub> BART limits in MI Reg. Haze SIP for Boiler 8. <b>USEPA FIP BART Requirements:</b> 0.35 lb. NO <sub>x</sub> /MMBtu (30-day avg); NO <sub>x</sub> CEM system to verify compliance. Limit effective January 2, 2013.
Escanaba Paper Company (previously New Page) No. 9 Boiler	MI Reg. Haze SIP proposed existing use of inherently low sulfur biomass fuel as BART for Boiler 9.	Improvements in combustion control already implemented; limits in the FIP require that the current levels of NO <sub>x</sub> control be maintained.	MI Reg. Haze SIP proposed existing controls as BART for Boiler 9. USEPA disapproved of NO <sub>x</sub> BART limits in MI Reg. Haze SIP for Boiler 9. <b>USEPA FIP BART Requirements:</b> 0.27 lb. NO <sub>x</sub> /MMBtu; NO <sub>x</sub> emission testing requirement to verify compliance. Limit effective January 2, 2013.
St. Marys Cement	Management of raw feed content of sulfur (lime, limestone) The FIP BART determination sets an SO <sub>2</sub> lbs/ton of clinker limit	Pre-calcliner and indirect firing system (IDF) for cement kiln; FIP BART Determination is operation of existing SNCR system (for a 50% reduction in NO <sub>x</sub> emissions).	MI Reg. Haze SIP proposed existing controls as BART for cement kiln. USEPA disapproved of NO <sub>x</sub> and SO <sub>2</sub> BART limits in MI Reg. Haze SIP for cement kiln. <b>USEPA FIP BART Requirements:</b> SNCR and a 50% reduction in NO <sub>x</sub> emissions. NO <sub>x</sub> emission limits were set in the FIP effective January 1, 2017. <b>USEPA FIP BART Limits:</b> 2.80 lb NO <sub>x</sub> /ton clinker (30-day rolling avg), 2.40 lbs NO <sub>x</sub> /ton clinker (12-month avg), and 7.50 lbs SO <sub>2</sub> /ton clinker (12-month avg) effective date January 1, 2017.
Smurfit Stone Container Corp.	Mobotec's Furnace Sorbent Injection (FSI) System.	Mobotec's Rotating Opposed Fire Air (ROFA) fan system.	Existing Mobotec ROFA and proposed FSI are BART. Plant has been shut down since February 2010.

Source Name	SO <sub>2</sub> BART Controls	NO <sub>x</sub> BART Controls	Comments
Tilden Mining Company (TMC)	Existing equipment is BART.	Low NOX burners to be installed on the indurating furnace.	<p>MI SIP proposed existing equipment/limits as BART. USEPA disapproved NOx and SO2 BART limits in SIP for indurating furnace, boilers, line dryers, grate kiln. EPA Proposed FIP BART</p> <p><b>Requirements:</b> Low NOX burners on indurating furnace; NOX limits of 1.5 lb NOX/MMBtu (720-hr rolling avg) coal or coal/nat gas mixture firing; or 2.8 lb/MMBtu (720-hr rolling avg) nat gas firing. S content limit of 1.2% S fuel - process boilers #1 and #2, 1.50% S fuel - Line 1 Dryer. By 6 mo. after the effective date of Rule, Grate Kiln Line 1 0.60 %S (wt) coal limit (monthly block avg); Line 1 initial SO2 limit - 500lbs SO2/hr (30 day rolling avg). CEMS to confirm or modify the SO2 limit - may not increase &gt; 500 lbs/hr.</p>

## **Additional Control Measures Michigan Relied Upon for the Regional Haze Program**

In addition to the BART sources discussed in the previous part, the MDEQ includes the following control programs in achieving the emission reductions needed in the Regional Haze SIP to reduce haze impacts.

### **Clean Air Interstate Rule (CAIR) and Cross State Air Pollution Rule (CSAPR)**

The State implemented the CAIR NO<sub>x</sub> budget program under the Michigan Part 8 Air Pollution Control Rules from 2009 through 2014. CAIR was replaced by CSAPR beginning in 2015. CSAPR will continue the allocation of NO<sub>x</sub> and SO<sub>2</sub> allowances to EGUs, along with a trading program administered by the USEPA. Within the past few months, NO<sub>x</sub> and SO<sub>2</sub> allowances through 2020 have been distributed to the State EGUs by the USEPA.

Tables 7, 8, 9, and 10 of this report list the NO<sub>x</sub> and SO<sub>2</sub> emission reductions from EGUs subject to CAIR/CSAPR and BART over the 2009-2013 period. The emission reductions are substantial, especially from the CAIR/CSAPR-subject EGUs. For example, for the top 12 sources impacting Seney listed in Table 10 (all of which are EGUs) the combined SO<sub>2</sub> and NO<sub>x</sub> reduction over the 2009-2013 timeframe exceeds 100,000 tons.

### **Other Federal Programs**

Significant emission reductions from several federal rules were included in the modeling of predicted 2018 emissions as part of the 2010 Regional Haze SIP. The federal controls listed below were included in the SIP modeling.

- Tier II for on-highway mobile sources.
- Heavy-duty diesel (2007) engine standards.
- Low sulfur fuel standards.
- Federal control programs for non-road mobile sources.

As detailed in the 2010 Regional Haze SIP, these controls were predicted to result in substantial SO<sub>2</sub> and NO<sub>x</sub> emissions reductions by 2018. Estimates were approximately 80% reductions in both SO<sub>2</sub> and NO<sub>x</sub> emissions by 2018 from the federal highway vehicle programs, and approximately 27% reductions in SO<sub>2</sub> emissions and 39% in NO<sub>x</sub> emissions by 2018 for non-road mobile sources (Table 10.3.2.e - "Summary of Four Factor Analysis of on-the-books Controls," 2010 Michigan Regional Haze SIP).

### **Noteworthy Source Activity Changes**

This part provides information on additional sources of significant emission reductions impacting visibility at the Class I areas.

#### **Detroit Edison (DTE) Monroe Power Plant**

Very large reductions in SO<sub>2</sub> emissions were achieved for the DTE Monroe Power Plant over the 2009-2013 time period due to the installation of wet FGD systems on the four boilers at the plant. The wet FGD began operation in 2009 for Units 3 and 4 and in 2014 for Units 1 and 2. Actual SO<sub>2</sub> emissions were reduced from 85,899 tons in 2009 to 43,765 tons in 2013 for a total reduction of approximately 43,000 tons over the five year period. This reduction has almost

doubled since 2014 with the added controls on the other two units. The plant has also achieved a substantial reduction in actual NO<sub>x</sub> emissions over the 2009-2013 time period (approximately 5,000 tons). The facility has been permitted for low-NO<sub>x</sub> burners and selective catalytic reduction (SCR) NO<sub>x</sub> controls on all four units.

In summary, combined SO<sub>2</sub> and NO<sub>x</sub> emissions from DTE Monroe Power Plant have been reduced over 47,000 tons over the 2009-2013 period. See Tables 7 and 10 for actual emissions data for 2009-2013 and a comparison to the other facilities with significant modeled impacts on visibility in the Isle Royale and Seney Class I areas. It should be noted that DTE Monroe Power Plant has reduced combined actual SO<sub>2</sub> and NO<sub>x</sub> emissions over 2009-2013 far more than any of the other plants listed in Tables 7 and 10.

### **Smurfit Stone Container Corporation**

As also described earlier in this report, the SSCC plant had been shut down since approximately late 2009 or early 2010. No emissions were recorded in MAERS after 2010 and no active permits for the facility were found in the Michigan records of PTIs and ROPs. The shutdown has resulted in a reduction of approximately 1,400 tons of combined SO<sub>2</sub> and NO<sub>x</sub> actual emissions since 2009 (last year with significant reported emissions).

### **Emissions Reductions from Regional Haze SIP Strategies**

As in our 2010 Regional Haze SIP submittal, the State continues to believe that SO<sub>2</sub> and NO<sub>x</sub> emissions are the most important contributors to haze formation that impacts the Isle Royale and Seney Class I areas. In addition, the recent USEPA guidance for the five-year progress reports identified SO<sub>2</sub> and NO<sub>x</sub> emissions reductions from EGUs as critical elements of the States' regional haze strategies (USEPA guidance document, April 2013, p.8). Accordingly, the following evaluations of emission reductions have been limited to include only SO<sub>2</sub> and NO<sub>x</sub>.

### **Emission Reductions from SIP Control Measures**

This part of the Progress Report addresses the emission reductions from the five BART sources over the 2009-2013 period resulting from the Regional Haze SIP control measures based on actual emission information. The annual emission data do not yet show significant reductions for NO<sub>x</sub> and SO<sub>2</sub> for most of these sources. More specifically, the control measure implementation deadline dates had not as yet passed by the end of 2013 for certain controls at Lafarge and St. Marys Cement. However, the shutdown of the SSCC facility resulted in a 1,400-ton SO<sub>2</sub> and NO<sub>x</sub> reduction from 2009 levels for 2010 and beyond.

### **Lafarge Midwest, Inc. – Alpena Plant**

The interim, facility-wide 12-month rolling limits of the federal/state Consent Decree (Consent Decree Limits - USA, USEPA, Michigan, et al. v. Lafarge; U.S. District Court Civil Action No. 3:10-cv-00044-JPG-CJP) are listed below along with actual annual facility-wide emission estimates (Table 2, below) for the 2009-2013 period. Annual actual facility-wide emission rates for 2011 (6,907 tons per year NO<sub>x</sub> and 10,905 tons per year SO<sub>2</sub>) were well below the Consent Decree 2011 interim 12-month rolling limits. Annual actual facility-wide emission rates for 2013 were further reduced for NO<sub>x</sub> (to 4,504 tons per year); however, 2013 actual SO<sub>2</sub> emissions increased (10,087 tons per year) while remaining below the Consent Decree interim limit.

**NO<sub>x</sub>**

Interim Limit (facility-wide 12-Month Rolling): 8,650 tons by January 1, 2011

**SO<sub>2</sub>**

Interim Limit (facility-wide 12-Month Rolling): 13,100 tons by January 1, 2011.

**TABLE 2  
LAFARGE MIDWEST, INC. – ALPENA  
FACILITY-WIDE ACTUAL EMISSIONS**

<b>Year</b>	<b>NO<sub>x</sub> (tons/year)</b>	<b>SO<sub>2</sub> (tons/year)</b>
2013	4,504	10,087
2012	5,102	7,820
2011	6,907	10,905
2010	6,894	8,466
2009	6,271	7,469

**Escanaba Paper Company (referenced in Michigan 2010 Regional Haze SIP  
Submittal as New Page)**

The USEPA issued a final rule effective on January 3, 2013, imposing a FIP for Escanaba Paper Company's Boilers 8 and 9 that specified NO<sub>x</sub> BART limits. The Boiler 8 NO<sub>x</sub> limit was changed by USEPA to a fixed, rolling 30-day average limit of 0.35 lb of NO<sub>x</sub> per MMBtu, rather than a weighted average of separate limits for oil-firing and gas-firing. A CEM system was the required means of compliance determination for Boiler 8. The Boiler 9 NO<sub>x</sub> limit was set by the FIP at 0.27 lb per MMBtu with compliance determination by means of emission testing.

Annual actual facility-wide emission rates for 2009 through 2013 for NO<sub>x</sub> and SO<sub>2</sub> are provided in Table 3. The annual emission data do not show any significant reductions for NO<sub>x</sub> and SO<sub>2</sub>.

**TABLE 3  
ESCANABA PAPER COMPANY  
FACILITY-WIDE ACTUAL EMISSIONS**

<b>Year</b>	<b>NO<sub>x</sub> (tons/year)</b>	<b>SO<sub>2</sub> (tons/year)</b>
2013	2,549	1,950
2012	2,160	1,210
2011	2,530	2,196
2010	2,428	2,309
2009	2,303	2,204

### St. Marys Cement Company

The USEPA imposed a FIP setting BART SO<sub>2</sub> and NO<sub>x</sub> limits that will be effective January 1, 2017. The ROP has since been modified to add a requirement specifying that St. Marys Cement must comply with applicable BART by the USEPA deadline. The State will re-open the ROP to incorporate the specific FIP BART requirements into the ROP at that time.

Annual actual facility-wide emission rates for 2009 through 2013 for NO<sub>x</sub> and SO<sub>2</sub> are provided in Table 4. The annual emission data do not as yet show any significant reductions for NO<sub>x</sub> and SO<sub>2</sub>.

**TABLE 4  
ST. MARYS CEMENT FACILITY-WIDE ACTUAL EMISSIONS**

Year	NO <sub>x</sub> (tons/year)	SO <sub>2</sub> (tons/year)
2013	2,369	2,560
2012	2,369	2,560
2011	1,996	1,942
2010	2,251	2,045
2009	2,180	2,864

### Smurfit Stone Container Corporation

The 2010 Regional Haze SIP indicated that the Smurfit Stone Container Corporation plant had been shut down since February 2010. No emissions were recorded in MAERS after 2010 and no active permits for the facility were found in the Michigan records of PTIs and ROPs. A report of a State inspection on August 27, 2010, indicates the mill had been closed since the Autumn of 2009.

Smurfit Stone Container Corporation's annual actual facility-wide emission rates for 2009 through 2013 for NO<sub>x</sub> and SO<sub>2</sub> are provided in Table 5. As expected, there have been no reported emissions since the shutdown reported for late 2009 or early 2010.

**TABLE 5  
SMURFIT STONE CONTAINER CORPORATION FACILITY-WIDE ACTUAL EMISSIONS**

Year	NO <sub>x</sub> (tons/year)	SO <sub>2</sub> (tons/year)
2013	*	*
2012	*	*
2011	*	*
2010	2.23	0.01
2009	208	1,231

\* No emission data listed in MAERS.

## Tilden Mining Company, LLC

The USEPA issued a final rule effective on March 8, 2013, that specified a FIP for certain equipment that imposed NO<sub>x</sub> BART limits for the indurating furnace/grate-kiln (EUKILN1) and SO<sub>2</sub> BART limits for the furnace/grate-kiln as well as other equipment.

Annual actual facility-wide emission rates for 2009 through 2013 for NO<sub>x</sub> and SO<sub>2</sub> are provided in Table 6. The annual emission data do not as yet show any significant reductions for NO<sub>x</sub> and SO<sub>2</sub>.

**TABLE 6  
TILDEN MINING COMPANY FACILITY-WIDE ACTUAL EMISSIONS**

Year	NO <sub>x</sub> (tons/year)	SO <sub>2</sub> (tons/year)
2013	6,142	1,132
2012	6,149	1,617
2011	5,535	1,036
2010	5,520	1,112
2009	3,260	580

### Sources Reporting SO<sub>2</sub>/NO<sub>x</sub> to the Clean Air Markets Division (CAMD) USEPA

This part of the Progress Report looks at the point source facilities that were predicted to have the highest impacts on visibility in the 2010 Regional Haze SIP submittal document. EGU sources make up the majority of sources addressed by in-state/out-state data, with non-EGU sources comprising the majority when looking only at in-state sources.

The sources are evaluated for trends in actual NO<sub>x</sub> and SO<sub>2</sub> emissions over the 2009 to 2013 period. Emissions data for in-state sources was derived from the MAERS, which was accessed at: [http://www.deq.state.mi.us/maers/emissions\\_query.asp](http://www.deq.state.mi.us/maers/emissions_query.asp). Data for out-of-state sources was either downloaded from the USEPA Air Markets Program Data (AMPD) site (<http://ampd.epa.gov/ampd/?bookmark=4982>); or obtained from various state air pollution control agency Web sites if not found in the AMPD download data.

The top ten in-state point sources in terms of projected impacts on the Isle Royale and Seney Class I areas are tabulated separately in Tables 7 and 8, respectively, along with their NO<sub>x</sub> and SO<sub>2</sub> actual emissions for 2009 and 2013. The facilities are listed in descending rank order in each table based on the projected Calpuff 1/M-m values listed in Tables 10.3.2.a and 10.3.2.b, respectively, from the 2010 Regional Haze SIP document. Almost all of these sources are either BART-subject sources or EGUs.

Evaluating Table 7 that applies to the Isle Royale Class I area, it is evident that the emission reduction for the top ten impacting point sources combined was largest for SO<sub>2</sub> with a reduction of almost 48,000 tons over the 2009-13 period. A lesser reduction for these 10 sources combined was found for NO<sub>x</sub> at approximately 8,400 tons. These reductions account for more than one-third of statewide point source NO<sub>x</sub> emissions reductions and over one-half of statewide point source SO<sub>2</sub> reductions for the 2009-2013 period. The source with by far the largest combined NO<sub>x</sub> and SO<sub>2</sub> reductions in Table 7 was the DTE Monroe Power Plant with combined NO<sub>x</sub>/SO<sub>2</sub> reductions of 47,000 tons.

Table 8 shows similar results for the Seney Class I area for the top ten in-state point sources, although reductions for both NO<sub>x</sub> and SO<sub>2</sub> were much less than for the sources impacting Isle Royale. The emission reduction for the top ten point sources was largest for SO<sub>2</sub>, with a reduction of approximately 16,000 tons over the 2009-13 time frame. A lesser reduction of roughly 2,700 tons was found for NO<sub>x</sub>. The top ten point sources impacting Seney account for approximately 12% of NO<sub>x</sub> statewide point source emission reductions and 20% of statewide SO<sub>2</sub> point source emission reductions. The source with the largest combined NO<sub>x</sub> and SO<sub>2</sub> reduction on the list was the Wisconsin Electric Power Company with combined NO<sub>x</sub> and SO<sub>2</sub> reductions of 6,000 tons.

A similar comparison of actual emission reductions for the 2009-2013 period was made for the facilities included on the top 30 in-state and out-of-state sources from Tables 10.3.2.c and of the 2010 Regional Haze SIP document. Tables 9 and 10 list only the top 12 sources from each of these two tables, along with their NO<sub>x</sub> and SO<sub>2</sub> actual emissions for 2009 and 2013. The facilities are listed in descending rank order in each table based on the projected deciview (dv) visibility estimates from Tables 10.3.2.c and 10.3.2.d of the 2010 Regional Haze SIP document.

Evaluating Table 9 that applies to the Isle Royale Class I area, it is evident that the emission reduction for the top 12 impacting point sources combined was largest for SO<sub>2</sub> with a reduction of almost 85,200 tons over the 2009-2013 period. A lesser reduction for these 12 sources combined was found for NO<sub>x</sub>, at approximately 17,400 tons. The source with by far the largest combined NO<sub>x</sub> and SO<sub>2</sub> reductions in the table was the Minnesota Power, Inc. - Boswell Energy Center with combined NO<sub>x</sub> and SO<sub>2</sub> reductions of 65,000 tons.

Table 10 shows similar results for the Seney Class I area for the top 12 in-state and out-of-state sources, with total combined reductions for NO<sub>x</sub> and SO<sub>2</sub> that were similar in magnitude to those for the top 12 sources impacting Isle Royale. The emission reduction for the top 12 point sources was largest for SO<sub>2</sub> with a reduction of approximately 76,900 tons over the 2009-2013 period. A lesser reduction of roughly 24,500 tons was found for NO<sub>x</sub>. The source with the largest combined NO<sub>x</sub> and SO<sub>2</sub> reductions on the list was the DTE Monroe Power Plant with combined NO<sub>x</sub>/SO<sub>2</sub> reductions of 47,000 tons.

**TABLE 7**  
**2009 vs 2013 ACTUAL NO<sub>x</sub> AND SO<sub>2</sub> EMISSIONS FOR THE TOP TEN IN-STATE SOURCES IN MICHIGAN IMPACTING VISIBILITY (based on CALPUFF) AT ISLE ROYALE NATIONAL PARK**

Facility, City	Facility I.D.	2010 MI SIP CALPUFF Results (1/M-m)	2010 MI SIP Visibility (dv)	2009 NO <sub>x</sub> Actual Emissions (tons)	2013 NO <sub>x</sub> Actual Emissions (tons)	NO <sub>x</sub> Emissions Change: 2013 vs 2009 (tons)	2009 SO <sub>2</sub> Actual Emissions (tons)	2013 SO <sub>2</sub> Actual Emissions (tons)	SO <sub>2</sub> Emissions Change: 2013 vs 2009 (tons)
Wisconsin Electric Power Co. <sup>1</sup> Marquette	B4261	0.775	0.839	5,949	3,556	-2,393	9,612	6,001	-3,611
Empire Iron Mining Partnership <sup>2</sup> Ishpeming	B1827	0.766	0.037	2,388	2,715	326	1,143	201	-941
Tilden Mining Company LLC <sup>2</sup> Ishpeming	B4885	0.209	0.175	3,260	6,142	2,882	580	1,132	552
Smurfit Stone Container Corp. <sup>2</sup> Ontonagon	A5754	0.205		208	0	-208	1,231	0	-1,231
J.H. Campbell Plant <sup>1</sup> West Olive	B2835	0.088	0.507	8,597	6,008	-2,589	26,832	23,628	-3,204
Detroit Edison/ Monroe Power <sup>1</sup> Monroe	B2816	0.084	0.136	20,393	15,436	-4,957	85,899	43,765	-42,134
Escanaba Paper Company <sup>2</sup> Escanaba	A0884	0.067		2,303	2,549	246	2,204	1,950	-254
Marquette Board of Light & Power <sup>1</sup> Marquette	B1833	0.064		258	321	64	93	404	311
Neenah Paper-Michigan, Inc. Munising	B1470	0.046		230	237	7	697	674	-22
Lafarge North America <sup>2</sup> Alpena	B1477	0.04	0.170	6,271	4,504	-1,767	7,469	10,087	2,618
		Top 10 Sources Totals		49,858	41,468	-8,389	135,760	87,842	-47,917
		All MI Sources, Statewide <sup>3</sup>		144,440	122,653	-21,787	310,000	230,109	-79,891

<sup>1</sup> EGU's subject to CAIR. Currently CSAPR applies. <sup>2</sup> BART-subject sources. <sup>3</sup> Does not include transportation, residential and small, stationary sources.

**TABLE 8  
2009 vs 2013 ACTUAL NO<sub>x</sub> AND SO<sub>2</sub> EMISSIONS FOR THE TOP TEN IN-STATE SOURCES IN  
MICHIGAN IMPACTING VISIBILITY (based on CALPUFF) AT SENEY NATIONAL WILDLIFE REFUGE**

Facility, City	Facility I.D.	2010 MI SIP CALPUFF Results (1/M-m)	2010 MI SIP Visibility (dv)	2009 NO <sub>x</sub> Actual Emissions (tons)	2013 NO <sub>x</sub> Actual Emissions (tons)	NO <sub>x</sub> Emissions Change: 2013 vs 2009 (tons)	2009 SO <sub>2</sub> Actual Emissions (tons)	2013 SO <sub>2</sub> Actual Emissions (tons)	SO <sub>2</sub> Emissions Change: 2013 vs 2009 (tons)
Wisconsin Electric Power Co. <sup>1</sup> Marquette	B4261	0.565	0.222	5,949	3,556	-2,393	9,612	6,001	-3,611
Empire Iron Mining Partnership <sup>2</sup> Ishpeming	B1827	0.494	0.067	2,388	2,715	326	1,143	201	-941
J.H. Campbell Plant <sup>1</sup> West Olive	B2835	0.493	0.768	8,597	6,008	-2,589	26,832	23,628	-3,204
Escanaba Paper Company <sup>2</sup> Escanaba	A0884	0.316		2,303	2,549	246	2,204	1,950	-254
Kam-Weadock Facility <sup>1</sup> Essexville	B2840	0.311	0.270	4,311	3,548	-763	20,121	15,490	-4,631
St. Marys Cement, Inc. <sup>2</sup> Charlevoix	B1559	0.187		2,180	2,369	189	2,864	2,560	-304
B.C. Cobb Plant <sup>1</sup> Muskegon	B2836	0.182		2,586	2,220	-365	9,630	7,043	-2,587
Tilden Mining Company LLC <sup>2</sup> Ishpeming	B4885	0.148	0.109	3,260	6,142	2,882	580	1,132	552
City of Escanaba Generating Station	B1573	0.128		225	17	-208	924	105	-819
Manistique Papers, Inc. Manistique	A6475	0.12		239	190	-49	1,020	666	-354
		Top 10 Sources Totals		32,039	29,314	-2,725	74,929	58,776	-16,153
		All MI Sources, Statewide <sup>3</sup>		144,440	122,653	-21,787	310,000	230,109	-79,891

<sup>1</sup> EGUs subject to CAIR. Currently CSAPR applies. <sup>2</sup> BART-subject sources. <sup>3</sup> Does not include transportation, residential and small, stationary sources.

**TABLE 9**  
**2009 vs 2013 ACTUAL NO<sub>x</sub> AND SO<sub>2</sub> EMISSIONS FOR THE TOP 12 IN-STATE AND OUT-STATE SOURCES**  
**IMPACTING VISIBILITY AT ISLE ROYALE NATIONAL PARK**

Facility, City County and State	Facility I.D.	2010 MI SIP Deciview Estimate	2009 NO <sub>x</sub> Actual Emissions (tons)	2013 NO <sub>x</sub> Actual Emissions (tons)	NO <sub>x</sub> Emissions Change: 2013 vs 2009 (tons)	2009 SO <sub>2</sub> Actual Emissions (tons)	2013 SO <sub>2</sub> Actual Emissions (tons)	SO <sub>2</sub> Emissions Change: 2013 vs 2009 (tons)
Wisconsin Electric Power Co., Marquette, Marquette, MI	B2461	0.83927	5,949	3,556	-2,393	9,612	6,001	-3,611
J.H. Campbell Plant West Olive, Ottawa, MI	B2835	0.50708	8,597	6,008	-2,583	26,832	23,628	-3,204
Xcel Energy-Sherburne Generating Plant (formerly NSP), Becker, Sherburne, MN	2714100004	0.44585	13,878	8,298	-5,580	24,016	7,706	-16,310
WPL-Edgewater Gen. Station (formerly WPL- Alliant), Sheboygan, Sheboygan, WI	460033090	0.43193	2,962	1,815	-1,147	13,448	13,761	313
Georgia-Pacific Consumer Products (formerly Fort James), Green Bay, Brown, WI	405032870	0.36391	3,143	3,391	247	13,105	12,636	-468
Minnesota Power, Inc.- Boswell Energy Center Cohasset, Itasca, MN	2706100004	0.34702	11,217	4,696	-6,522	63,442	5,215	-58,227
WPL-Columbia Energy Center (formerly Alliant) Pardeeville, Columbia, WI	111003090	0.33165	4,767	4,882	115	24,228	22,194	-2,034
Minnesota Power-Taconite Harbor Energy, Schroeder, MN	2703100001	0.27882	1,664	781	-883	3,562	2,991	-570
Midwest Generation EME (aka Joliet 29), Joliet, Will, IL	197809ABZ	0.23289	3,885	2,821	-1,064	14,554	12,403	-2,151
Expiera Specialty Solutions (formerly International Paper), Kaukauna, Outagamie, WI	445031180	0.22347	2,293	1,830	-463	7,629	8,152	522
Tilden Mining Company Ishpeming, Marquette, MI	B4885	0.17458	3,260	6,142	2,882	580	1,132	552
Latarge North America Alpena, Alpena, MI	B1477	0.16985	6,271	4,504	-1,767	7,469	10,087	2,618
Total Emission Reductions					-17,397			-85,189

**TABLE 10**  
**2009 vs 2013 ACTUAL NO<sub>x</sub> AND SO<sub>2</sub> EMISSIONS FOR THE TOP 12 IN-STATE AND OUT-STATE SOURCES**  
**IMPACTING VISIBILITY AT SENEY NATIONAL WILDLIFE REFUGE**

Facility, City County and State	Facility I.D.	2010 MI SIP Decisive Estimate	2009 NO <sub>x</sub> Actual Emissions (tons)	2013 NO <sub>x</sub> Actual Emissions (tons)	NO <sub>x</sub> Emissions Change: 2013 vs 2009 (tons)	2009 SO <sub>2</sub> Actual Emissions (tons)	2013 SO <sub>2</sub> Actual Emissions (tons)	SO <sub>2</sub> Emissions Change: 2013 vs 2009 (tons)		
JH Campbell Plant, West Olive, Ottawa, MI	B2835	0.76837	8,597	6,008	-2,589	26,832	23,628	-3,204		
Midwest Gen. EME (aka Joliet 29), Joliet, Will, IL	197809ABZ	0.50992	3,885	2,821	-1,064	14,554	12,403	-2,151		
WPL-Edgewater Gen. Station (formerly WPL- Alliant), Sheboygan, Sheboygan, WI	460033090	0.47144	2,962	1,815	-1,147	13,448	13,761	313		
St. Clair-Belle River Power Plant, St. Clair, MI	B2796	0.40775	19,826	17,777	-2,049	57,001	54,898	-2,103		
WPL-Columbia Energy Center (formerly Alliant), Pardeeville, Columbia, WI	111003090	0.34743	4,767	4,882	115	24,228	22,194	-2,034		
Rockport (aka IN-MI- Power), Spencer, IN	20	0.32325	19,762	17,201	-2,561	54,796	51,636	-3,160		
Detroit Edison Monroe Power, Monroe, Monroe, MI	B2816	0.32295	20,393	15,436	-4,957	85,899	43,765	-42,134		
Lafarge North America, Alpena, Alpena, MI	B1477	0.30828	6,271	4,504	-1,767	7,469	10,087	2,618		
Xcel Energy, Sherburne Gen. Plant (formerly NSP), Becker, Sherburne, MN	2714100004	0.29421	13,878	8,298	-5,580	24,016	7,706	-16,310		
Georgia-Pacific Consumer Products (formerly Fort James), Green Bay, Brown, WI	405032870	0.29202	3,143	3,391	247	13,105	12,636	-468		
Kam-Weadock Facility, Essexville, Bay, MI	B2840	0.27039	4,311	3,548	-763	20,121	15,490	-4,631		
Wisconsin Electric Power Co., Marquette, Marquette, MI	B4261	0.22242	5,949	3,556	-2,393	9,612	6,001	-3,611		
<b>Total Emission Reductions</b>									<b>-24,508</b>	<b>-76,876</b>

## **Visibility Progress**

### **Five-Year Average Change in Visibility Impairment**

USEPA regulations specify in 40 CFR Sections 51.308(g)(3) and 51.309(d)(10)(i)(C) the following requirements on evaluation of visibility impairment for the five-year progress report.

*For each mandatory Class I Federal area within the State, the State must assess the following visibility conditions and changes, with values for most impaired and least impaired days expressed in terms of five-year averages of these annual values.*

- (i) The current visibility conditions for the most impaired and least impaired days;*
- (ii) The difference between current visibility conditions for the most impaired and least impaired days and baseline visibility conditions;*
- (iii) The change in visibility impairment for the most impaired and least impaired days over the past 5 years.*

The MDEQ acquired IMPROVE Aerosol RHR, New Equation visibility data from the Federal Land Manager Environmental Database (<http://views.cira.colostate.edu/fed>) for the Isle Royale and Seney Class I sites. Five-year averages were computed from the Air Quality Related Values (AQRV) menu on the site, which provided time plots and data charts of the visibility Haze Index for the 2000-2014 period. Data was presented in terms of Haze Index in dv on an annual basis for the most impaired and least impaired days.

The MDEQ computed five-year rolling averages of the data to provide the comparisons required in the USEPA guidance for the progress report. The five-year 2009-2013 visibility trend was also computed in dv/year for each set of data. The annual data and five-year rolling average data are presented below in Tables 11 and 12 for Isle Royale and Seney, respectively, along with 2000-2004 baseline estimates and uniform rate of progress (URP) estimates from the 2010 Michigan Regional Haze SIP.

Lake Michigan Air Directors Consortium (LADCO) staff also reviewed the Federal Land Manager Environmental Database data for 2000-2014 and provided plots in terms of Haze Index in dv for Isle Royale and Seney to exhibit trends in the data relative to the State's RPG established in the 2010 Regional Haze SIP.

### **Isle Royale National Park - Visibility Progress**

The Isle Royale five-year rolling average comparison (Table 11) for the most impaired days shows a reduction from 21.7 dv to 18.9 dv over the 2009-2013 period. This comparison also results in an annual average change rate of -0.56 dv. The 2013 five-year rolling average for Isle Royale (18.9 dv) was already below the 2018 RPG (20.86 dv) and the 2018 glide path uniform URP estimate (19.43 dv). The State 2018 RPG and 2018 URP estimates for Isle Royale were taken from Table 10.3.2.g of the 2010 Regional Haze SIP.

The Isle Royale five-year rolling average comparison (Table 11) for the least impaired days also shows a reduction from 6.1 dv to 5.4 dv over the 2009-2013 period. This reduction results in an annual average change rate of -0.15 dv over the five-year period. The five-year rolling average

Haze Index for 2013 remains below the 2000-2004 baseline Haze Index value (6.77 dv). Through 2064 the baseline Haze Index Value must not be degraded per the USEPA Regional Haze regulations.

Time plots of the measured Isle Royale annual and five-year rolling average Haze Index values (in deciviews) for both most impaired and least impaired days are provided in Figure 1 for the 2000-2014 period. Figure 1 also depicts the trend line from the 2001-2004 baseline (21.59 dv) to the Michigan 2018 RPG (20.86 dv) for the most impaired days.

**TABLE 11  
VISIBILITY TRENDS – HAZIEST AND CLEAREST DAYS\* ISLE ROYALE NATIONAL PARK**

Year	Annual Avg Haze Index (dv)	5-yr Rolling Avg	Trend – 2009-2013 (dv/yr)	2018 RPG <sup>^</sup>	2018 URP or Max Allowed <sup>^</sup>	Baseline <sup>^</sup>
<b><i>Haziest – 20% Most Impaired Days</i></b>						
2000	20.2					<b>21.59</b>
2001	22.5					
2002	21.5					
2003	19.9					
2004	19.6	20.7				
2005	23.5	21.4				
2006	21.8	21.3				
2007	21.7	21.3				
2008	21.1	21.5				
2009	20.6	<b>21.7</b>	<b>-0.56</b>			
2010	19.0	20.8				
2011	19.3	20.3				
2012	18.1	19.6				
2013	17.6	<b>18.9</b>				
2014	19.1	18.6				
2018				<b>20.86</b>	<b>19.43</b>	
Natural condition, haziest days	12.36					

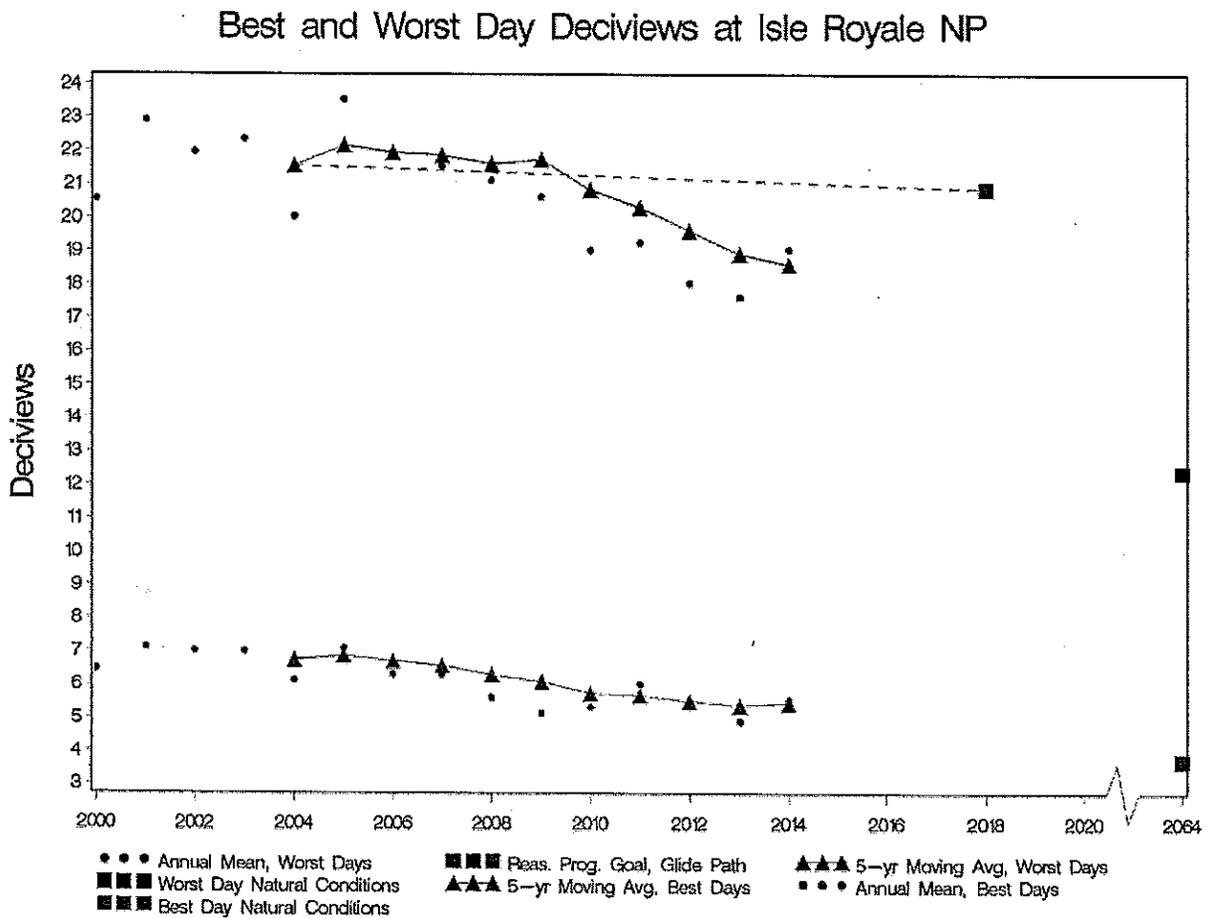
TABLE 11, continued

Year	Annual Avg Haze Index (dv)	5-yr Rolling Avg	Trend – 2009-2013 (dv/yr)	2018 RPG <sup>^</sup>	2018 URP or Max Allowed <sup>^</sup>	Baseline <sup>^</sup>
<b>Clearest – 20% Least Impaired Days</b>						
2000	6.5					<b>6.77</b>
2001	7.2					
2002	7.1					
2003	7.0					
2004	6.1	6.8				
2005	7.1	6.9				
2006	6.4	6.7				
2007	6.4	6.6				
2008	5.6	6.3				
2009	5.1	<b>6.1</b>	<b>-0.15</b>			
2010	5.3	5.8				
2011	6.1	5.7				
2012	5.5	5.5				
2013	4.9	<b>5.4</b>				
2014	5.6	5.5				
2018					<b>6.77</b>	
Natural condition – clearest days	3.72					

\* The MDEQ acquired IMPROVE Aerosol RHR, New Equation visibility data from the Federal Land Manager Environmental Database (<http://views.cira.colostate.edu/fed>) for the Isle Royale and Seney Class I sites.

<sup>^</sup> 2018 RPG, 2018 URP, Max Allowed, Natural Condition days, and Baseline derived from Table 10.3.2.g, "State Implementation Plan for Regional Haze," Michigan Department of Natural Resources & Environment, Air Quality Division, October 2010. "URP" applies to most impaired days and "Max Allowed" applies to least impaired days.

**FIGURE 1  
BEST AND WORST DAY DECIVIEWS AT ISLE ROYALE NATIONAL PARK**



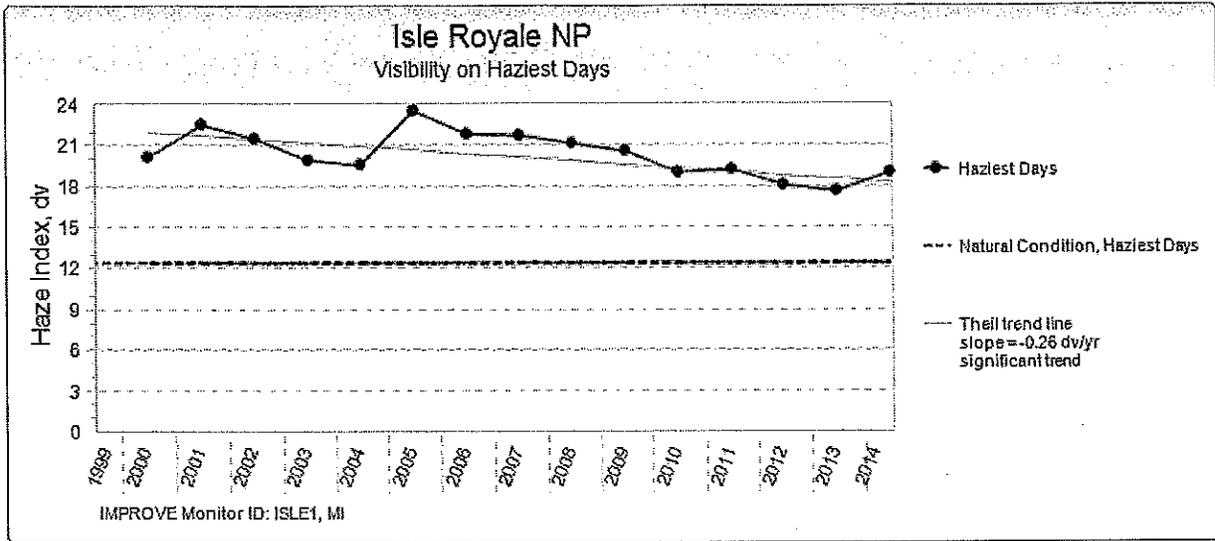
Source: LADCO plot using Federal Land Manager Environmental Database information (<http://views.cira.colostate.edu/fed>).

The MDEQ also included plots from the Federal Land Manager Environmental Database Web site showing visibility long-term trends (2000-2014) for both the most impaired and least impaired days for Isle Royale (see Figures 2 and 3).

The long-term trend line shown on Figure 2 for the most impaired days lists a slope of -0.26 dv/year. This trend line slope is better than the glide path/URP slope from 2004 to 2018 needed to meet the 2018 glide path/URP (-0.154 dv/yr); or the glide path/URP to meet natural conditions in 2064 (-0.1538 dv/yr) for Isle Royale. The monitored trend line slope also is better than the modeled "Projected Annual Improvement 2004-2018" (-0.11 dv/yr) for Isle Royale presented in Table 10.6.a of the 2010 Regional Haze SIP submittal.

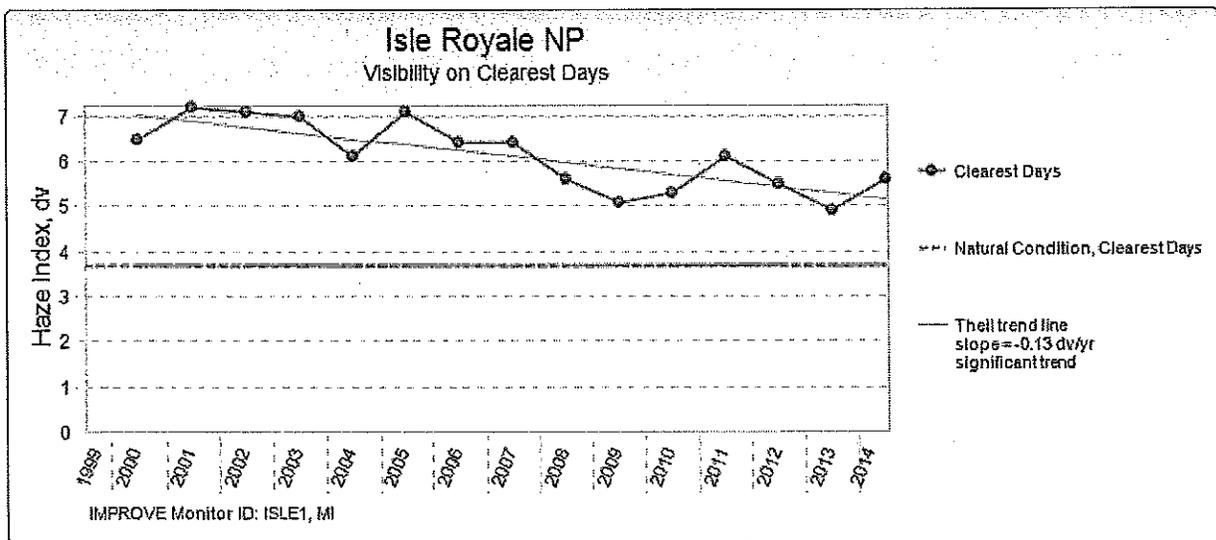
Figure 3 shows a long-term trend line for the least impaired days with a slope of -0.13 dv/year. This trend line slope is better than the glide path/URP slope from 2004 needed to meet natural conditions in 2064 (-0.0508 dv/yr) for Isle Royale.

FIGURE 2



Source: Federal Land Manager Environmental Database information (<http://views.cira.colostate.edu/fed>).

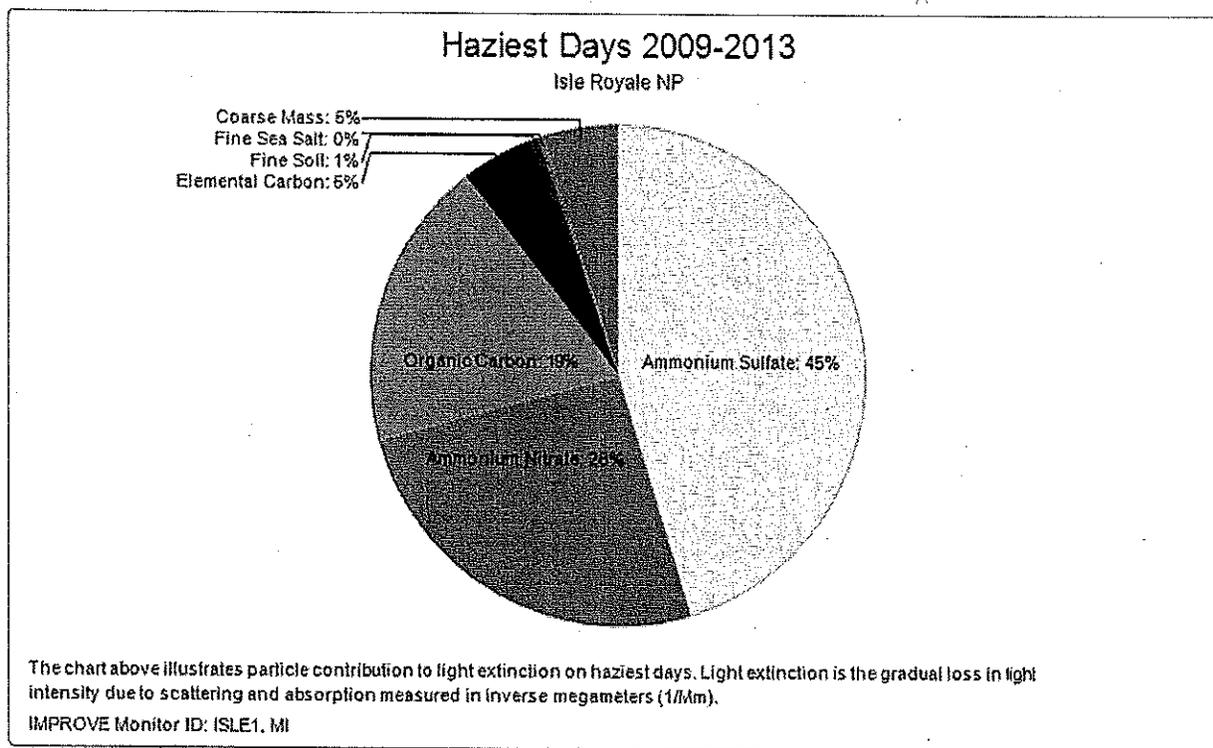
FIGURE 3



Source: Federal Land Manager Environmental Database information (<http://views.cira.colostate.edu/fed>).

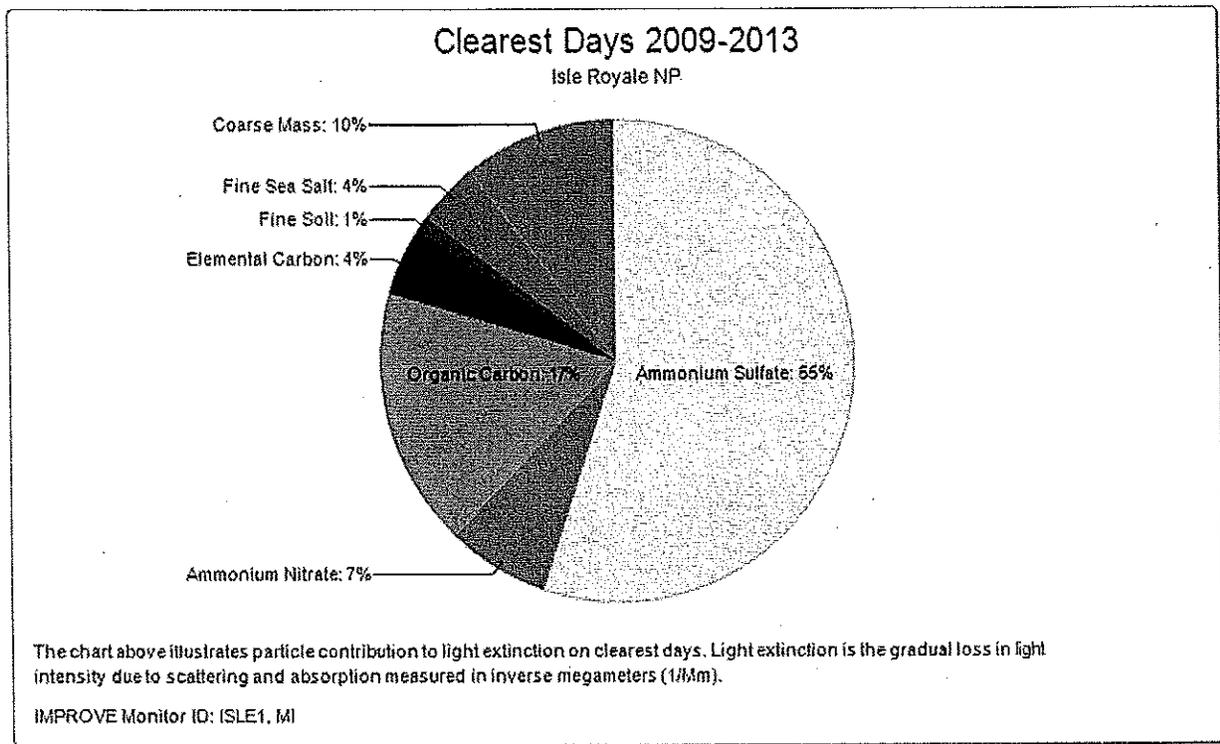
Pollutant contributions to visibility impairment at Isle Royale for the 2009-2013 period are shown in Figure 4 (Most Impaired Days) and Figure 5 (Least Impaired Days). This information was obtained from the Federal Land Manager Environmental Database Web site (<http://views.cira.colostate.edu/fed>). It is evident from the figures that the most significant pollutant contributing to haze at Isle Royale is ammonium sulfate for both the most impaired (45% contribution) and least impaired days (55% contribution). Ammonium nitrate is seen to also contribute significantly to the worst days (26% contribution), but only minimally (7%) for the clearest days. Organic carbon is the next largest contributor (17-19%) and does not vary significantly between the most impaired days and the least impaired days.

**FIGURE 4**  
**Isle Royale National Park Pollutant Contributions**  
**Most Impaired Days**



Source: Federal Land Manager Environmental Database information (<http://views.cira.colostate.edu/fed>).

**FIGURE 5  
Isle Royale National Park Pollutant Contributions  
Least Impaired Days**



Source: Federal Land Manager Environmental Database information (<http://views.cira.colostate.edu/fed/>).

### Seney National Wildlife Refuge - Visibility Progress

The Seney five-year rolling average comparison (Table 12) for the most impaired days shows a reduction from 24.2 dv to 20.6 dv over the 2009-2013 period. This comparison also results in an annual average reduction of 0.73 dv. The 2013 five-year rolling average for Seney (20.6 dv) was already below the 2018 RPG (23.58 dv) and the 2018 glide path/URP estimate (21.64 dv). The Michigan 2018 RPG and 2018 URP estimates for Seney were taken from Table 10.3.2.g of the 2010 Regional Haze SIP. Similarly, a reduction from 6.4 dv to 5.5 dv over the 2009-2013 time period was determined for the least impaired days, along with an annual average reduction of 0.19 dv.

The five-year rolling average Haze Index for 2013 for the least impaired days remains below the 2000-2004 baseline Haze Index value (7.14 dv) that must not be degraded through 2064 per the USEPA Regional Haze regulations. Time plots of the measured Seney annual Haze Index values for both most impaired and least impaired days are provided below in Figure 6 for the 2000-2014 period. Figure 6 also depicts the Seney trend line from the 2001-2004 baseline (24.37 dv) to the State's 2018 RPG (23.58 dv) for the most impaired days.

**TABLE 12**  
**Visibility Trends – Haziest And Clearest Days\* Seney**  
**National Wildlife Refuge**

Year	Annual Avg Haze Index (dv)	5-yr Rolling Avg	Trend – 2009-2013 (dv/yr)	2018 RPG^	2018 URP or Max Allowed^	Baseline^
<b>Haziest – 20% Most Impaired Days</b>						
2000	23.0					<b>24.37</b>
2001	25.3					
2002	24.6					
2003	24.5					
2004	23.2	24.2				
2005	26.2	24.8				
2006	24.8	24.7				
2007	26.6	25.1				
2008	22.2	24.6				
2009	21.3	<b>24.2</b>	<b>-0.73</b>			
2010	22.0	23.4				
2011	20.6	22.5				
2012	19.8	21.2				
2013	19.2	<b>20.6</b>				
2014	19.9	20.3				
2018				<b>23.58</b>	<b>21.64</b>	
Natural condition, haziest days	12.65					

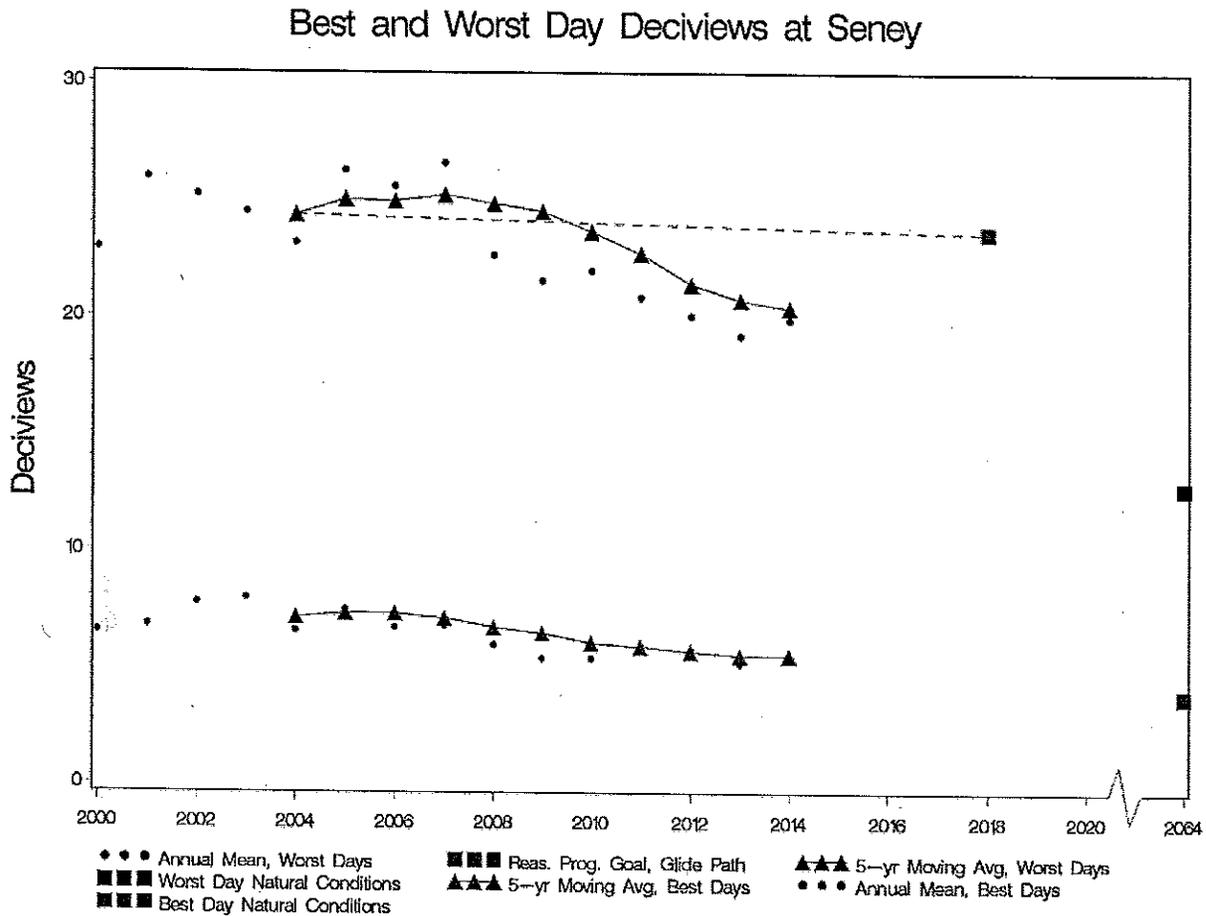
**TABLE 12, continued**

Year	Annual Avg Haze Index (dv)	5-yr Rolling Avg	Trend – 2009-2013 (dv/yr)	2018 RPG <sup>^</sup>	2018 URP or Max Allowed <sup>^</sup>	Baseline <sup>^</sup>
<b><i>Clearest – 20% Least Impaired Days</i></b>						
2000	6.5					<b>7.14</b>
2001	6.8					
2002	7.8					
2003	8.0					
2004	6.6	7.1				<b>7.14</b>
2005	7.5	7.3				
2006	6.7	7.3				
2007	6.8	7.1				
2008	5.9	6.7				
2009	5.3	<b>6.4</b>	<b>-0.19</b>			
2010	5.4	6.0				
2011	5.9	5.9				
2012	5.7	5.6				
2013	5.2	<b>5.5</b>				
2014	5.5	5.5				
2018					<b>7.14</b>	
Natural condition – clearest days	3.73					

\* The MDEQ acquired IMPROVE Aerosol RHR, New Equation visibility data from the Federal Land Manager Environmental Database (<http://views.cira.colostate.edu/fed>) for the Isle Royale and Seney Class I sites.

<sup>^</sup> 2018 RPG, 2018 URP, Max Allowed, Natural Condition days, and Baseline derived from Table 10.3.2.g, "State Implementation Plan for Regional Haze," Michigan Department of Natural Resources & Environment, Air Quality Division, October 2010. "URP" applies to most impaired days and "Max Allowed" applies to least impaired days.

**FIGURE 6**  
**Best and Worst Day Deciviews At Seney National Wildlife Refuge**

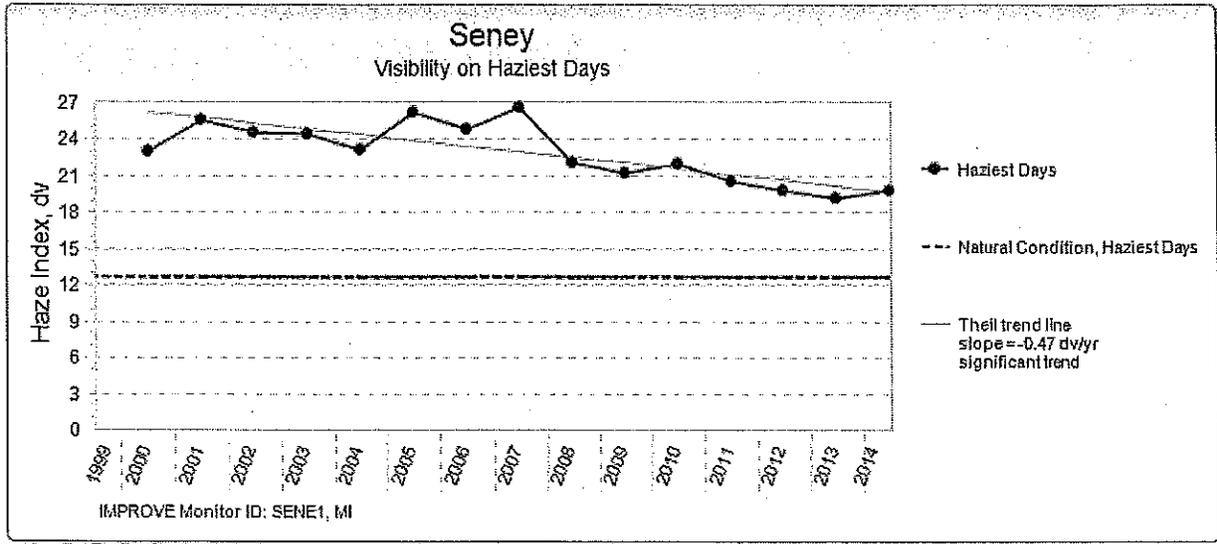


Source: Federal Land Manager Environmental Database information (<http://views.cira.colostate.edu/fed>).

The State also included plots from the Federal Land Manager Environmental Database Web site showing visibility long-term trends (2000-2014) for both the most impaired and least impaired days for Seney (see Figures 7 and 8).

The long-term trend line shown on Figure 7 for the most impaired days lists a slope of -0.47 dv/year. This long-term trend line slope is better than the glide path/URP slope from 2004 to 2018 needed to meet the 2018 glide path/URP (-0.195 dv/yr); or the glide path/URP to meet natural conditions in 2064 (-0.4062 dv/yr) for Seney. The monitored long-term trend line slope also is better than the modeled "Projected Annual Improvement 2004-2018" (-0.13 dv/yr) for Seney presented in Table 10.6.a of the 2010 Regional Haze SIP submittal.

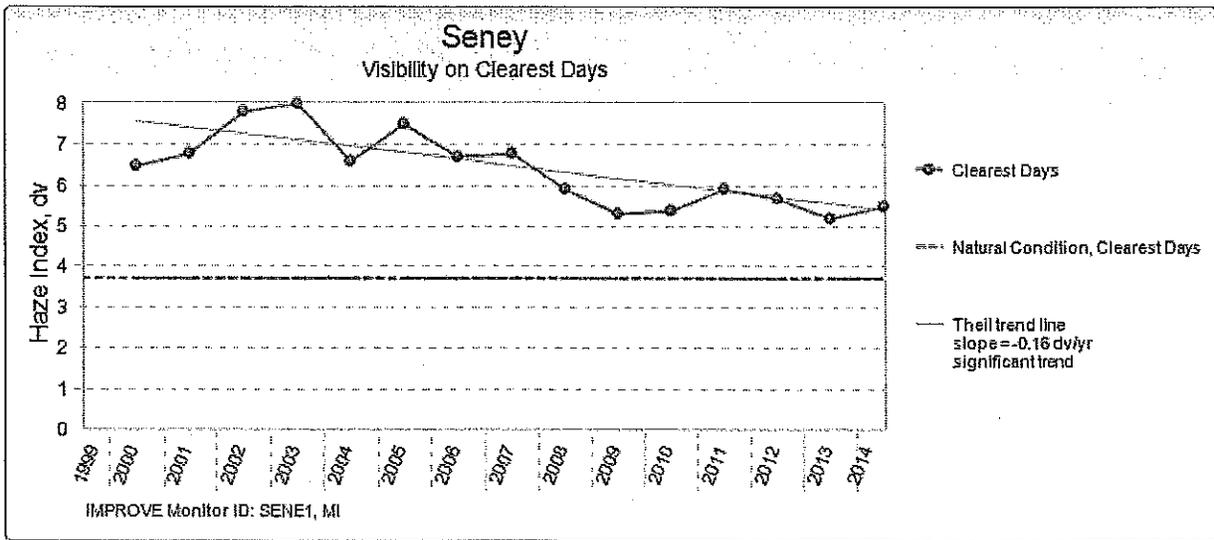
FIGURE 7



Source: Federal Land Manager Environmental Database information (<http://views.cira.colostate.edu/fed>).

Figure 8 shows a trend line for the least impaired days with a slope of -0.16 dv/year. This trend line slope is better than the glide path/URP slope from 2004 needed to meet natural conditions in 2064 (-0.0568 dv/yr) for Seney.

FIGURE 8

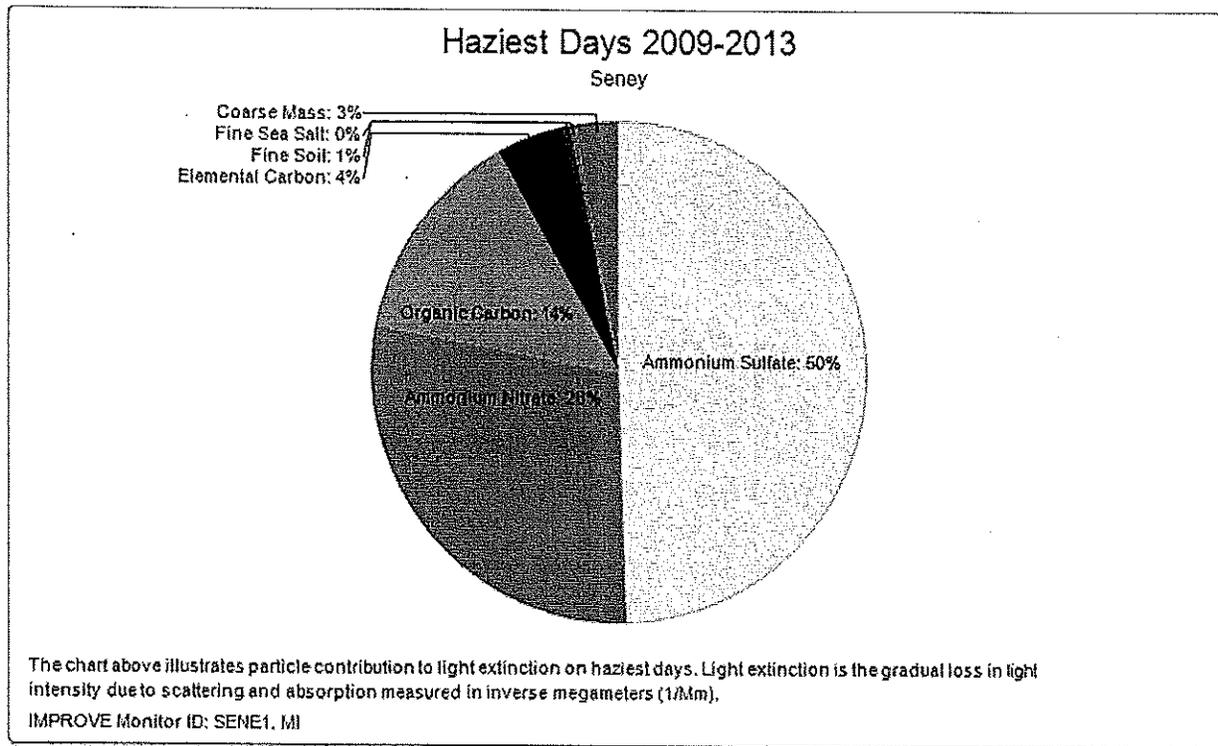


Source: Federal Land Manager Environmental Database information (<http://views.cira.colostate.edu/fed>).

Pollutant contributions to visibility impairment at Seney for the 2009-2013 period are shown in Figure 9 (Most Impaired Days) and Figure 10 (Least Impaired Days). This information was obtained from the Federal Land Manager Environmental Database Web site:

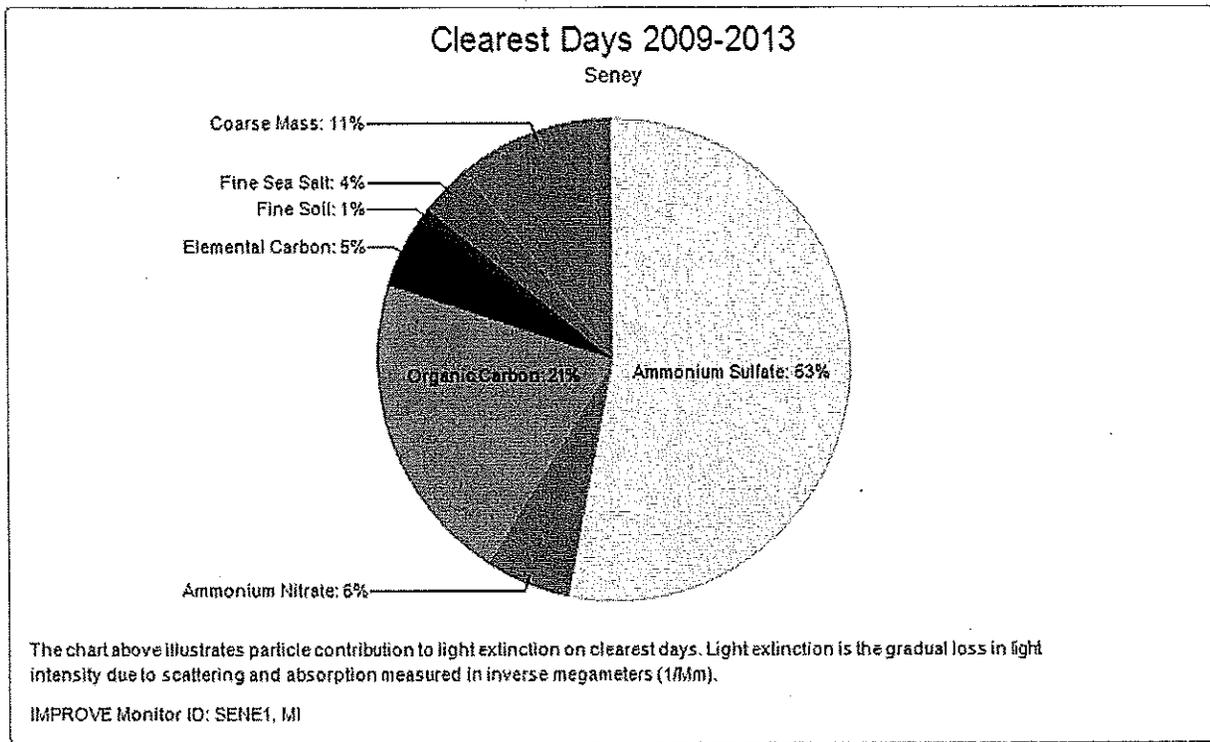
<http://views.cira.colostate.edu/fed>. As with Isle Royale, the most significant pollutant contributing to haze at Seney is ammonium sulfate (50-53% range) for both the most impaired and least impaired days. Also similar to the Isle Royale charts, ammonium nitrate at Seney contributes significantly to the worst days (28% contribution), but only minimally (6%) for the clearest days. Organic carbon contributes less (14-21%) with the highest contributions for the least impaired days.

**FIGURE 9**  
**Seney Wildlife Refuge Area Pollutant Contributions**  
**Most Impaired Days**



Source: Federal Land Manager Environmental Database information (<http://views.cira.colostate.edu/fed>).

**FIGURE 10**  
**Seney National Wildlife Refuge Pollutant Contributions**  
**Least Impaired Days**



Source: Federal Land Manager Environmental Database information (<http://views.cira.colostate.edu/fed>).

In summary, the Haze Index data presented in Tables 11 and 12 for the most impaired days demonstrates that visibility levels for both Isle Royale and Seney as of 2013 had already been reduced to below both the Michigan 2018 RPG and the 2018 glide path/URP levels, showing good progress towards meeting the 2064 natural background goals. In addition, the data presented for the least impaired days shows that the visibility levels for both Isle Royale and Seney as of 2013 had not degraded to the 2000-2004 baseline levels and had in fact improved to further below baseline levels. Further, the long-term trend lines for the most impaired and least impaired days for both Isle Royale and Seney are more than sufficient when compared to the glide path/URP slopes needed to meet natural conditions in 2064 (assuming these rates of progress continue). These monitoring results provide an improved future outlook for the Michigan Class I areas in contrast to the modeling results presented in Table 10.6.a of the 2010 Michigan Regional Haze SIP submittal. The modeling projections in these 2010 tables had suggested that the Michigan RPGs would not be sufficient to meet either the Isle Royale or the Seney 2018 glide path/URP levels; and that the 2064 natural condition levels would be not be met for either Class I area.

## Emissions Progress

### **NO<sub>x</sub> and SO<sub>2</sub> Statewide Point Source Emissions**

Statewide point source emissions for Michigan were determined for both 2009 and 2013 for the five-year progress report. Actual NO<sub>x</sub> and SO<sub>2</sub> emission data for this comparison was derived from the MAERS, which was accessed at: <http://www.deq.state.mi.us/maers/emissionsquery.asp>.

The 2009 and 2013 actual NO<sub>x</sub> and SO<sub>2</sub> data is summarized in Table 13. The data indicates substantial reductions over the five year evaluation period for both NO<sub>x</sub> (21,787 tons) and SO<sub>2</sub> (79,891 tons).

**TABLE 13**  
**2009 vs 2013 STATEWIDE ACTUAL NO<sub>x</sub> AND SO<sub>2</sub> EMISSIONS FOR MICHIGAN POINT SOURCES**

Source Category	2009 NO <sub>x</sub> Actual Emissions (tons)	2013 NO <sub>x</sub> Actual Emissions (tons)	NO <sub>x</sub> Emissions Change: 2013 vs 2009 (tons)	2009 SO <sub>2</sub> Actual Emissions (tons)	2013 SO <sub>2</sub> Actual Emissions (tons)	SO <sub>2</sub> Emissions Change: 2013 vs 2009 (tons)
All MI Sources, Statewide <sup>1</sup>	144,440	122,653	-21,787	310,000	230,109	-79,891

<sup>1</sup> Does not include transportation, residential, and small stationary sources.

### **NO<sub>x</sub> and SO<sub>2</sub> Total Statewide Emissions**

The 2011 National Emission Inventory (NEI) Tier 1/Tier 2 emission inventory data for NO<sub>x</sub> and SO<sub>2</sub> was acquired from the USEPA Web site at: <http://www3.epa.gov/ttn/chief/net/2011inventory.html>. The emission data included the following source categories: EGU, non-EGU, on-road, non-road, MAR (marine, air and rail), and area. This data was tabulated together with similar data from the 2010 Michigan Regional Haze SIP submittal in Table 14 to allow a long-term comparison with a prior year (2005) and with projected emissions for 2018. The 2005 inventory data and the 2018 emission projections were taken from Table 8.a of the 2010 Regional Haze SIP. The 2011 NEI data was used since this is the most current data that includes the various non-point source emission categories. 2014 NEI data is not yet available.

As expected, the 2011 totals for NO<sub>x</sub> and SO<sub>2</sub> show downward trends compared to the 2005 data for all categories. The most substantial decrease is for SO<sub>2</sub> emissions from the EGU category (over 120,000 tons). This large reduction is likely a result of the federal CAIR regulations. On-road NO<sub>x</sub> emissions also showed a large decrease (almost 50,000 tons). Overall total reductions were large for both NO<sub>x</sub> (125,000 tons) and SO<sub>2</sub> (165,000 tons). Total NO<sub>x</sub> emissions were reduced by 21% and SO<sub>2</sub> emissions by 38% over the 2005 to 2011 period.

Comparison of the 2011 actual emission estimates to the 2018 projections suggests that the State has achieved much of the needed reductions to meet the glide path/URP for 2018. The source category with 2011 emissions are higher than expected when compared to the 2018 projection in the on-road NO<sub>x</sub> category. However, it may be that 2011 NO<sub>x</sub> emissions for the

on-road category are an over-estimate. The upcoming 2014 on-road NO<sub>x</sub> NEI emission estimate can be compared to 2011 to determine if the 2011 estimate is reasonable. It should also be recognized that there was a change in the model used to estimate on-road emissions between 2005 (MOBILE6) and 2011 (MOVES). MOVES tends to estimate higher NO<sub>x</sub> levels than MOBILE6.

**TABLE 14  
NO<sub>x</sub> AND SO<sub>2</sub> STATEWIDE EMISSION TRENDS  
(tons/year)**

<b>2005</b>	<b>NO<sub>x</sub></b>	<b>SO<sub>2</sub></b>
EGU	120,332	350,701
Non-EGU	85,898	58,284
On-road	244,345	4,211
Non-Road	70,541	6,830
MAR <sup>^</sup>	26,280	5,824
Area	39,085	13,294
Total	586,482	439,145
<b>2011</b>	<b>NO<sub>x</sub></b>	<b>SO<sub>2</sub></b>
EGU	74,752	230,033
Non-EGU	82,238	38,892
On-road	194,730	955
Non-Road	56,431	176
MAR <sup>^</sup>	14,447	2,770
Area	38,700	806
Total	461,298	273,632
% Change (05-11)	-21%	-38%
<b>2018</b>	<b>NO<sub>x</sub></b>	<b>SO<sub>2</sub></b>
EGU	79,544	242,853
Non-EGU	88,062	56,724
On-road	56,758	1,201
Non-Road	34,486	106
MAR <sup>^</sup>	12,820	1,553
Area	37,879	11,891
Total	309,549	314,328

<sup>^</sup> MAR = Marine, air and rail. Extracted MAR estimates from "Off-highway" category from 2011 Michigan NEI data. Remaining "Off-highway" values after subtracting MAR estimates were used as "non-road" estimates for 2011 in the table above.

### **Assessment of Changes Impeding Visibility Progress**

The MDEQ noted that on-road NO<sub>x</sub> emissions had not been reduced over the 2005 through 2011 period as much as anticipated. This was evident from the data presented in Table 14. The on-road source category has a larger than expected remaining reduction (138,000 tons) needed to meet the projected 2018 emission levels listed in the Michigan 2010 Regional Haze SIP submittal. This issue was also recently discussed with the MDEQ's USEPA Region 5 Regional Haze contact.

In addition, it should be noted that the Minnesota Regional Haze five-year progress report referenced a similar issue related to on-road NO<sub>x</sub> emissions (Chapter 2.D, p. 22).

The MDEQ will compare the upcoming 2014 on-road NO<sub>x</sub> NEI emission estimates to the 2011 on-road NEI data to determine if the 2011 estimate is an anomaly or due to inaccuracies in on-road emission inventory models. The MDEQ also understands that there was a change in the model used to estimate on-road emissions between 2005 (MOBILE6) and 2011 (MOVES); and that MOVES tends to estimate higher NO<sub>x</sub> levels than MOBILE6. The MDEQ will continue discussion with the USEPA Region 5 contact on this issue and will also consult with LADCO and the other Region 5 States on on-road NO<sub>x</sub> emission estimates.

While this is an issue that merits further investigation, the MDEQ does not consider this a significant issue impeding visibility progress for the Michigan Regional Haze SIP for two primary reasons. First of all, visibility trends for 2009 through 2013 for Seney and Isle Royale have shown that the trend for each area is already below both the RPG and the glide path/URP for 2018 for the most impaired days at each site. Also, visibility trends are downward and below the "no degradation" trend line for each site for the least impaired days. Secondly, substantial NO<sub>x</sub> and SO<sub>2</sub> reductions have occurred for those point sources predicted by modeling to have the largest impacts on visibility at Seney and Isle Royale.

Transborder emissions from Canada have the potential to impede visibility progress for the Michigan Class I areas. Michigan previously evaluated the potential impacts of Canadian wildfires in the October 2010 Regional Haze SIP submittal. Section 10.5.5 of the SIP references possible impacts at Isle Royale and Seney due to wildfires in Canada:

*The MRPO (2007) identified three days at Isle Royale and one day at Seney that had high OC. Using back trajectories and satellite maps of fires, it appears that monitoring data for all of the days was influenced by wildfires in Canada. Subtracting these days from the 20 percent worst days had a 0.2 dV reduction for Isle Royale and no change at Seney.*

*Although the data show that fires do have some impact on visibility at Isle Royale, the impacts on the 20 percent worst days tend to be only a few poor visibility days in the summer caused by wildfires. Often these wildfires occur in Canada. For these reasons, the DNRE determined that OC particles are not good candidates for additional controls as part of the long-term strategy. Emissions from wildfires should be included in natural condition estimates, and any transboundary fire impacts must be addressed by the EPA.*

The MDEQ believes there is a need to work with the USEPA and Canada on transboundary air pollution issues including emission sources impacting visibility at Michigan's two Class I areas. The MDEQ has had recent joint discussions with the USEPA and Environment Canada regarding SO<sub>2</sub> cross-boundary issues and emission sources in Ontario. In future discussions with the USEPA and Canada, the MDEQ will also address visibility issues.

Recent discussions with the USEPA and Canada included MDEQ participation at the November 19, 2015, Canada/U.S. Air Quality Committee meeting. As discussed at the meeting, the Canada/U.S. Air Quality Committee, Subcommittee 2 on Scientific Cooperation 2016 Work Plan includes ongoing activities in support of the determination of transboundary contributions to visibility degradation including joint monitoring, modeling, and analysis; evaluation of visibility forecasting skill; and evaluation of inter-comparisons of different monitoring methodologies.

One of the ongoing efforts related to forest fires described in a the presentation at the Canada/U.S. Air Quality Committee meeting is a modeling project to forecast near-real time air quality levels from forest fire emissions. The modeling is done using the FireWork model developed by Environment Canada. This model is also capable of forecasting long range pollution transport from wildfires.

### **Assessment of Current Strategy**

As noted above, the MDEQ has identified substantial reductions of SO<sub>2</sub> and NO<sub>x</sub> emissions during the 2009-13 period from the top 12 modeled impacting sources (including both in-state and out-of-state sources) for Isle Royale and Seney, which were listed in each of Tables 9 and 10 of this report. The total combined SO<sub>2</sub> and NO<sub>x</sub> emission reductions over 2009-2013 for the top 12 sources impacting Isle Royale totaled over 100,000 tons. Likewise, the total combined SO<sub>2</sub> and NO<sub>x</sub> emission reductions over 2009-2013 for the top 12 sources impacting Seney totaled over 100,000 tons. A similar analysis was carried out for the top ten modeled in-state sources impacting Isle Royale and Seney (see Tables 7 and 8, respectively). Table 7 shows an SO<sub>2</sub> reduction of almost 48,000 tons and 8,400 tons of NO<sub>x</sub> for the top ten in-state impacting sources for Isle Royale. Table 8 shows an SO<sub>2</sub> reduction of 16,000 tons and 2,700 tons of NO<sub>x</sub> for the top ten impacting in-state sources for Seney.

The analysis of visibility trends for Seney and Isle Royale has also shown that the trend for each Class I area is already below both the RPG and the glide path/URP for 2018 for the most impaired days at each site. Also, visibility trends are improving and below the "no degradation" trend line for each site for the least impaired days.

As a result, the MDEQ concludes from this data that the State is on track to meet both the RPG and the glide path/URP for 2018 for both Seney and Isle Royale for the most impaired days; and both sites are expected to remain below the "no degradation" trend lines through 2018 and beyond.

### **Review of Visibility Monitoring Strategy**

Visibility is monitored for both Isle Royale and Seney. The monitoring sites are part of the IMPROVE monitoring network. IMPROVE monitoring for both sites started up in 1999 and continues today. The Seney monitoring site is operated by the U.S. Fish and Wildlife Service, and the Isle Royale site is operated by the National Park Service as part of the USEPA's Integrated Air Deposition Network. The Isle Royale monitor is located on the Keweenaw Peninsula in Eagle Harbor in Keweenaw County, and the Seney monitor is located in Schoolcraft County.

The MDEQ will continue to rely on the IMPROVE monitoring network to provide visibility data for Michigan's Class I areas. The MDEQ is not aware of a need for changes in the monitoring network.

### **Determination of Adequacy**

As noted in the assessment of the current 2010 Regional Haze SIP strategy, visibility and emission trends have shown significant progress. In fact, visibility monitoring shows levels below the 2018 glide path/URP levels and the RPG visibility levels set for Seney and Isle Royale in the 2010 Regional Haze SIP. As a result, the MDEQ does not see a need to revise our Regional Haze SIP at this time.

## **PROCEDURAL REQUIREMENTS**

### **Administrative Process**

The MDEQ has followed the formal SIP revision administrative procedures, including public review, before submitting the five-year progress report to the USEPA. The MDEQ scheduled the public participation process to include acceptance of written comment (including email) by November 18, 2015, to be considered by the decision-maker prior to final action. There was no request for a public hearing and, therefore, none was held. A formal response to comments document has been drafted and is included in Appendix B of the five-year progress report, and the comment correspondence (letters and email) are included in Appendix C.

### **Consultation with Federal Land Managers**

The MDEQ provided the FLM with an opportunity for consultation during the public participation process to review and discuss the draft five-year progress report. Written comments were received from the FLM included in the formal response to comments document.

### **Deadlines for Submitting the First Five-Year Progress Report Checklist**

The April 2013 USEPA regional haze progress reports guidance lists the initial Michigan Regional Haze SIP submittal date as November 5, 2010, and the first five-year progress report as being due no later than November 2015. The MDEQ completed the public participation administrative process and will submit the five-year progress report to the USEPA by December 31, 2015.

The following checklist was provided in the April 2013 USEPA regional haze progress reports guidance. The MDEQ has completed Table 15 to ensure the five-year progress report is complete.

**TABLE 15**  
**Five-Year Progress Report Submittal Checklist Submitted under**  
**40 CFR 51.308 (g)-(h) and 40 CFR 51.309(d)(10)**

Yes or No	Regulation Citation	Regulation Summary/Report Requirements	Location in Five-year Progress Report
Yes	51.308(g)(1) 51.309(d)(10)(i)(A)	Status of Control Strategies in the Regional Haze SIP: Does the report include a list of measures the State relied upon? <i>(all states)</i>	Status of Control Strategies in Regional Haze SIP (pgs 3-9)
Yes	51.308(g)(2) 51.309(d)(10)(i)(B)	Emissions Reductions from Regional Haze SIP Strategies: Does the report include estimated reduction estimates for these measures? <i>(all states)</i>	Emission Reductions from Regional Haze SIP Strategies (pgs 9-17)
Yes	51.308(g)(3) 51.309(d)(10)(i)(C)	Visibility Progress: Does the report include the summaries of monitored visibility data as required by the Regional Haze Rule? <i>(states with Class I areas only)</i>	Visibility Progress (pgs 27-39)
Yes	51.308(g)(4) 51.309(d)(10)(i)(D)	Emissions Progress: Does the report provide emissions trends across the entire inventory for a five-year period as required by the Regional Haze Rule? <i>(all states)</i>	Emissions Progress (pgs 27-29)
Yes	51.308(g)(5) 51.309(d)(10)(i)(E)	Assessment of Changes Impeding Progress: Does the report include an explicit statement of whether there are anthropogenic emissions changes impeding progress? <i>(all states)</i>	Assessment of Changes Impeding Progress (pgs 29-30)
Yes	51.308(g)(6) 51.309(d)(10)(i)(F)	Assessment of Current Strategy: Does the report include an assessment of whether the State's haze plan is on track to meet reasonable progress goals? <i>(all states)</i>	Assessment of Current Strategy (pg 30)

# **Appendix A**

**Lafarge Midwest, Inc., Permit to Install No. 195-10B**

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY AIR QUALITY DIVISION

May 17, 2013

**.PERMIT; TO INSTALL**  
19510B . .

**ISSUED TO**  
Lafarge Midwest, Inc.

**LOCATED AT**  
1435 Ford Avenue Alpemc1, Michigan

**IN THE COUNTY OF**  
Alpena

**STATE REGISTRATION NUMBER**  
B1477 .

The Air Quality Division has approved this Permit to Install, pursuant to the delegation of authority from the Michigan Department of Environmental Quality. This permit is hereby issued in accordance with and subject to Section 5505(1) of Article II, Chapter I, Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Pursuant to Air Pollution Control Rule 336.1201(1), this permit constitutes the permittee's authority to install the identified emission unit(s) in accordance with all administrative rules of the Department and the attached conditions. Operation of the emission unit(s) identified in this Permit to Install is allowed pursuant to Rule 336.1201(6).

DATE OF RECEIPT OF ALL INFORMATION REQUIRED BY RULE.203: <b>November 13, 2012</b>	
DATE PERMIT TO INSTALL APPROVED: <b>May 17, 2013</b>	SIGNATURE: <b>G. Vinson Hellwig</b>
DATE PERMIT VOIDED:	SIGNATURE:
DATE PERMIT REVOKED:	SIGNATURE:

## PERMIT TO INSTALL

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**Common Abbreviations / Acronyms**

Common Acronyms		Pollutant / Measurement Abbreviations	
AQD	Air Quality Division	BTU	British Thermal Unit
BACT	Best Available Control Technology	'C	Degrees Celsius
CM	Clean Air Act	CO	Carbon Monoxide
CEM	Continuous Emission Monitoring	dscf	Dry standard cubic foot
CFR	Code of Federal Regulations	dscm	Dry standard cubic meter
CO2e	Carbon Dioxide Equivalent	'F	Degrees Fahrenheit
COM	Continuous Opacity Monitoring	gr	Grains
EPA	Environmental Protection Agency	Hg	Mercury
EU	Emission Unit	hr	Hour
FG	Flexible Group	HzS	Hydrogen Sulfide
GAGS	Gallon of Applied Coating Solids	hp	Horsepower
GC	General Condition	lbs	Pounds
GHGs	Greenhouse Gases	kW	Kilowatt
HAP	Hazardous Air Pollutant	m	Meter
HVLP	High Volume Low Pressure *	mg	Milligram
ID	Identification	mm	Millimeter
LAER	Lowest Achievable Emission Rate	MM	Million
MACT	Maximum Achievable Control Technology	MW	Megawatts
MAERS	Michigan Air Emissions Reporting System	ng	Nanogram
MAP	Malfunction Abatement Plan	NO,	Oxides of Nitrogen
MDEQ	Michigan Department of Environmental Quality (Department)	PM	Particulate Matter
MSDS	Material Safety Data Sheet	PM10	PM less than 10 microns diameter
NESHAP	National Emission Standard for Hazardous Air Pollutants	PM2.5	PM less than 2.5 microns diameter
NSPS	New Source Performance Standards	pph	Pounds per hour
NSR	New Source Review	ppm	Parts per million
PS	Performance Specification	ppmv	Parts per million by volume
PSD	Prevention of Significant Deterioration	ppmw	Parts per million by weight
PTE	Permanent Total Enclosure	psia	Pounds per square inch absolute
PTI	Permit to Install	psig	Pounds per square inch gauge
RACT	Reasonably Available Control Technology	scf	Standard cubic feet
ROP	Renewable Operating Permit	sec	Seconds
SC	Special Condition	S02	Sulfur Dioxide
SCR	Selective Catalytic Reduction	THC	Total Hydrocarbons
SRN	State Registration Number	tpy	Tons per year
TAC	Toxic Air Contaminant	µg	Microgram
TEQ	Toxicity Equivalence Quotient	VOE	Volatile Organic Compound
VE	Visible Emissions	yr	Year

\* For High Volume Low Pressure (HVLP) applicators, the pressure measured at the HVLP gun air cap shall not exceed ten (10) pounds per square inch gauge (psig).

### GENERAL CONDITIONS

1. The process or process equipment covered by this permit shall not be reconstructed, relocated, or modified, unless a Permit to Install authorizing such action is issued by the Department, except to the extent such action is exempt from the Permit to Install requirements by any applicable rule. **(R 336.1201(1))**
2. If the installation, construction, reconstruction, relocation, or modification of the equipment for which this permit has been approved has not commenced within 18 months, or has been interrupted for 18 months, this permit shall become void unless otherwise authorized by the Department. Furthermore, the permittee or the designated authorized agent shall notify the Department via the Supervisor, Permit Section, Air Quality Division, Michigan Department of Environmental Quality, P.O. Box 30260, Lansing, Michigan 48909-7760, if it is decided not to pursue the installation, construction, reconstruction, relocation, or modification of the equipment allowed by this Permit to Install. **(R 336.1201(4))**
3. If this Permit to Install is issued for a process or process equipment located at a stationary source that is not subject to the Renewable Operating Permit program requirements pursuant to R 336.1210, operation of the process or process equipment is allowed by this permit if the equipment performs in accordance with the terms and conditions of this Permit to Install. **(R 336.1201(6)(b))**
4. The Department may, after notice and opportunity for a hearing, revoke this Permit to Install if evidence indicates the process or process equipment is not performing in accordance with the terms and conditions of this permit or is violating the Department's rules or the Clean Air Act. **(R 336.1201(8), Section 5510 of Act 451, PA 1994)**
5. The terms and conditions of this Permit to Install shall apply to any person or legal entity that now or hereafter owns or operates the process or process equipment at the location authorized by this Permit to Install. If the new owner or operator submits a written request to the Department pursuant to R 336.1219 and the Department approves the request, this permit will be amended to reflect the change of ownership or operational control. The request must include all of the information required by subrules (1)(a), (b), and (c) of R 336.1219 and shall be sent to the District Supervisor, Air Quality Division, Michigan Department of Environmental Quality. **(R 336.1219)**
6. Operation of this equipment shall not result in the emission of an air contaminant which causes injurious effects to human health or safety, animal life, plant life of significant economic value, or property, or which causes unreasonable interference with the comfortable enjoyment of life and property. **(R 336.1901)**
7. The permittee shall provide notice of an abnormal condition, start-up, shutdown, or malfunction that results in emissions of a hazardous or toxic air pollutant which continue for more than one hour in excess of any applicable standard or limitation, or emissions of any air contaminant continuing for more than two hours in excess of an applicable standard or limitation, as required in Rule 912, to the Department. The notice shall be provided not later than two business days after start-up, shutdown, or discovery of the abnormal condition or malfunction. Written reports, if required, must be filed with the Department within 10 days after the start-up or shutdown occurred, within 10 days after the abnormal conditions or malfunction has been corrected, or within 30 days of discovery of the abnormal condition or malfunction, whichever is first. The written reports shall include all of the information required in Rule 912(5). **(R 336.1912)**
8. Approval of this permit does not exempt the permittee from complying with any future applicable requirements which may be promulgated under Part 55 of 1994 PA 451, as amended or the Federal Clean Air Act.
9. Approval of this permit does not obviate the necessity of obtaining such permits or approvals from other units of government as required by law.
10. Operation of this equipment may be subject to other requirements of Part 55 of 1994 PA 451, as amended and the rules promulgated thereunder.

11. Except as provided in subrules (2) and (3) or unless the special conditions of the Permit to Install include an alternate opacity limit established pursuant to subrule (4) of R 336.1301, the permittee shall not cause or permit to be discharged into the outer air from a process or process equipment a visible emission of density greater than the most stringent of the following. The grading of visible emissions shall be determined in accordance with R 336.1303. **(R 336.1301)**
  - a) A six-minute average of 20 percent opacity, except for one six-minute average per hour of not more than 27 percent opacity.
  - b) A visible emission limit specified by an applicable federal new source performance standard.
  - c) A visible emission limit specified as a condition of this Permit to Install.
12. Collected air contaminants shall be removed as necessary to maintain the equipment at the required operating efficiency. The collection and disposal of air contaminants shall be performed in a manner so as to minimize the introduction of contaminants to the outer air. Transport of collected air contaminants in Priority I and II areas requires the use of material handling methods specified in R 336.1370(2). **(R 336.1370)**
13. The Department may require the permittee to conduct acceptable performance tests, at the permittee's expense, in accordance with R 336.2001 and R 336.2003, under any of the conditions listed in R 336.2001. **(R 336.2001)**

SPECIAL CONDITIONS

EMISSION UNIT SUMMARY TABLE

The descriptions provided below are for informational purposes and do not constitute enforceable conditions.

Emission Unit ID	Emission unit Description (Including Process Equipment & Control Device(s))	Installation/ Modification Date	Flexible Group ID
EU RAW MILL 14	<p>Raw Mill 14 further grinds the raw and alternate raw materials using a ball mill.</p> <p>Process Equipment: ball mill, cyclones, Separator, associated air slides, screws, elevators, pumps, storage silos, roller press, hammer mill, gas furnace/raw material dryer, storage bins, static separator, conveyor belts, screws, elevator.</p> <p>Control Devices: five dust collectors</p>	<p>1/1/1965, 9/1/1990</p>	<p>FG RAW MILL SYS, FG MERCURY</p>
EU RAW MILL 15	<p>Raw Mill 15 further grinds the raw and alternate raw materials using a ball mill.</p> <p>Process Equipment: ball mill, cyclones, separator, associated air slides, screws, Elevators, pumps, storage silos, roller press, hammer mill, gas furnace/raw material dryer, storage bins, static separator, conveyor belts, screws, elevator.</p> <p>Control Devices: five dust collectors.</p>	<p>1/1/1965, 9/1/1990</p>	<p>FG RAW MILL SYS, FG MERCURY</p>
EU KILN 19	<p>Kiln 19, an indirect fired rotating kiln.</p> <p>Process Equipment: rotary kiln, storage silo, waste heat recovery co-generating boiler, stack.</p> <p>Control Devices: one baghouse, two dust collectors; Selective Non-Catalytic Reduction (SNCR); Dry Absorbent Addition (DAA).</p>	<p>1/1/1962</p>	<p>FG KG5, FG KG5&amp;6, FG MERCURY</p>
EU KILN 20	<p>Kiln 20, an indirect fired rotating kiln.</p> <p>Process Equipment: rotary kiln, storage silo, waste heat recovery co-generating boiler, stack.</p> <p>Control Devices: one baghouse, two dust collectors; SNCR; DAA.</p>	<p>1/1/1965</p>	<p>FG KG5, FG KG5&amp;6, FG MERCURY</p>

Emission Unit ID	Emission Unit (Description) (Including Process Equipment and Control Device(s))	Installation/Modification Date	Flexible Group ID
EU KILN 21	<p>Kiln 21, an indirect fired rotating kiln.</p> <p>Process Equipment: rotary kiln, storage silo, waste heat recovery co-generating boiler, stack.</p> <p>Control Devices: one baghouse, two dust collectors; SNCR, DAA.</p>	1/1/1965	FG KG5, FG KG5&6, FG MERCURY
EU KILN 22	<p>Kiln 22, an indirect fired rotating kiln.</p> <p>Process Equipment: rotary kiln, storage silos, waste heat recovery boiler (generates steam to make electricity), stack shared by Kilns 22 and 23.</p> <p>Control Devices: one baghouse, two dust collectors, SNCR; Wet Flu Gas Desulfurization FGDI.</p>	1/1/1975 1/1/2013	FG KG6, FG KG5&6, FG MERCURY
EU KILN 23	<p>Kiln 23, an indirect fired rotating kiln.</p> <p>Process Equipment: rotary kiln, storage silos, waste heat recovery boiler (generates steam to make electricity), stack shared by Kilns 22 and 23.</p> <p>Control Devices: One baghouse, two dust collectors; SNCR; Wet FGD.</p>	1/1/1975 1/1/2013	FG KG6, FG KG5&6, FG MERCURY
EU CLINK COOL 19	<p>Clinker Cooler 19 cools the clinker.</p> <p>Process Equipment: clinker cooler, drag conveyor number seven.</p> <p>Control Devices: two dust collectors.</p>	1/22/1995	FG CLINK COOL, FG MERCURY
EU CLINK COOL 20	<p>Clinker Cooler 20 cools the clinker.</p> <p>Process Equipment: clinker cooler, two drag conveyors.</p> <p>Control Devices: three dust collectors.</p>	1/22/1995	FG CLINK COOL, FG MERCURY

Emission Unit ID	Emission Unit Description (Including Process Equipment & Control Device(s))	Installation/ Modification Date	Flexible Group ID
EU CLINK COOL 21	Clinker Cooler 21 cools the clinker.  Process Equipment: clinker cooler, two drag conveyors.  Control Devices: three dust collectors.	1/22/1995	FG CLINK COOL, FG MERCURY
EU CLINK COOL 22	Clinker Cooler 22 cools the clinker.  Process Equipment: clinker cooler, conveyor.  Control Devices: three dust collectors.	1/22/1995	FG CLINK COOL, FG MERCURY
EU CLINK COOL 23	Clinker Cooler 23 cools the clinker.  Process Equipment: clinker cooler, conveyor.  Control Devices: three dust collectors.	1/22/1995	FG CLINK COOL, FG MERCURY
EU FUEL PULV 19	Fuel pulverizer on Kiln 19, pulverizes the blended coal and coke and feeds this fuel to the kiln's burners.  Process Equipment: storage tanks, pulverizer, storage bin, conveyors, screw conveyor.  Control Devices: dust collectors.	6/1/2006	FG FUEL HAND, FG MERCURY
EU FUEL PULV 20	Fuel pulverizer on Kiln 20, pulverizes the blended coal and coke and feeds this fuel to the kiln's burners.  Process Equipment: storage tanks, pulverizer, storage bin, conveyor, screw conveyor.  Control Devices: dust collectors.	5/1/2007	FG FUEL HAND, FG MERCURY
EU FUEL PULV 21	Fuel pulverizer on Kiln 21, pulverizes the blended coal and coke and feeds this fuel to the kiln's burners.  Process Equipment: storage tanks, pulverizer, storage bin, conveyors, screw conveyor.  Control Devices: dust collectors.	12/1/2007	FG FUEL HAND, FG MERCURY

Emission Unit ID	Emission Unit Description (Including Process Equipment & Control Device(s))	Installation/Modification Date	Flexible Group ID
EU FUEL PULV 22	Fuel pulverizer on Kiln 22, pulverizes the blended coal and coke and feeds this fuel to the kiln's burners.  Process Equipment: storage tank, pulverizer, storage bin, conveyor, screw conveyor.  Control Devices: dust collectors.	2/1/2007	FG FUEL HAND, FG MERCURY
EU FUEL PULV 23	Fuel pulverizer on Kiln 23, pulverizes the blended coal and coke and feeds this fuel to the kiln's burners.  Process Equipment: storage tanks, pulverizer, storage bin, conveyors, screw conveyor.  Control Devices: dust collectors.	6/1/2006	FG FUEL HAND, FG MERCURY
Changes to the equipment described in this table are subject to the requirements of R 336.1201, except as allowed by R 336.1278 to R 336.1290.			

**FLEXIBLE GROUP SUMMARY TABLE**

The descriptions provided below are for informational purposes and do not constitute enforceable conditions.

Flexible Group ID	Flexible Group Description	Associated Emission Unit IDs
FG RAW MILL SYS	Raw Mill System mixes and grinds, and dries, the raw materials (limestone and sand) and alternate raw materials (slag, iron, and fly ash) then sends the material to the kilns.	EU RAW MILL 14, EU RAW MILL 15
FG KG5	Kiln Group 5 heats the raw materials and alternate raw materials to make clinker and sends clinker to FG CLINK COOL. The heated exhaust exits to the co-generating boiler.	EU KILN 19, EU KILN 20, EU KILN 21
FG KG6	Kiln Group 6 heats the raw materials and alternate raw materials to make clinker and sends clinker to FG CLINK COOL. The heated exhaust exits to the co-generating boiler.	EU KILN 22, EU KILN 23
FG CLINK COOL	Clinker Cooler cools the clinker, reclaims the hot air for return to the kilns, and moves clinker to FG CLINKER SYS.	EU CLINK COOL 19, EU CLINK COOL 20, EU CLINK COOL 21, EU CLINK COOL 22, EU CLINK COOL 23
FG MERCURY	The exhaust air containing mercury emissions, is emitted to atmosphere through the stacks on FG RAW MILL SYS, FG KG5, FG KG6, FG CLINK COOL, EU FUEL PULV 19, EU FUEL PULV 20, EU FUEL PULV 21, EU FUEL PULV 22, and EU PULV 23.	EU RAW MILL 14, EU RAW MILL 15, EU KILN 19, EU KILN 20, EU KILN 21, EU KILN 22, EU KILN 23, EU CLINK COOL 19, EU CLINK COOL 20, EU CLINK COOL 21, EU CLINK COOL 22, EU CLINK COOL 23, EU FUEL PULV 19, EU FUEL PULV 20, EU FUEL PULV 21, EU FUEL PULV 22, EU FUEL PULV 23

**The following conditions apply to: FG MERCURY**

**DESCRIPTION:** Mercury emissions are generated in the cement making process. Sulfur dioxide and mercury emissions are controlled by the wet FGD system on EU KILN 22 and EU KILN 23 (FG KG6). The wet FGD system includes a dewatering process which generates a bleed water stream. The bleed water is approximately 35 percent solids and contains mercury. The bleed water is routed to the five clinker coolers (FG CLINK COOL). In each clinker cooler the bleed water vaporizes and the exhaust air is emitted to atmosphere through the clinker cooler stacks, and the solids are reclaimed as clinker. A portion of the exhaust air leaving the clinker coolers is routed to the coal mill and is used to temper the air for the coal pulverizers. After tempering, the exhaust air exits to atmosphere through the stacks on the pulverizers.

The exhaust air containing mercury emissions is emitted to atmosphere through the stacks on FG RAW MILL SYS, FG KG5, FG KG6, and FG CLINK COOL and EU FUEL PULV 20, EU FUEL PULV 21, EU FUEL PULV 22, EU FUEL PULV 23.

**Emission Units:** EU RAW MILL 14 ball mill 20-050, cyclones 20-080, separators 20-090, 20-100, air slides 20-110, 20-111, 20-112, 20-113, 20-114, 20-115, 20-117, screws 20-460, 20-461, 20-463, 20-464, 20-465, 20-466, 20-467, elevators 20-072, 20-073, pumps 20-490, 20-491, storage silos, roller press 20-040, hammer mill 20-060, gas furnace/raw material dryer 20-065, storage bins 20-010, 20-011, static separator 20-100, conveyor belts 20-250, 20-255, 20-257, 20-258, 20-259, screws 20-033, 20-273, 20-462, 20-463, elevator 20-071.

EU RAW MILL 15 ball mill 21-050, cyclones 21-080, separator 21-090, 21-100, "air slides 21-110, 21-111, 21-112, 21-113, 21-114, 21-115, 21-117, screws 21-460, 21-461, 21-463, 21-464, 21-465, 21-466, 21-467, elevators 21-072, 21-073, pumps 21-490, 21-491, storage silos, roller press 21-040, hammer mill 21-060, gas furnace/raw material dryer 21-065, storage bins 21-010, 21-011, static separator 21-100, conveyor belts 21-250, 21-255, 21-257, 21-258, 21-259, screws 21-033, 21-273, 21-462, 21-463, elevator 21-071.

EU KILN 19 rotary kiln 25-119, storage silo 25-012.  
EU KILN 20 rotary kiln 25-120, storage silo 25-013.  
EU KILN 21 rotary kiln 25-121, storage silo 25-014.  
EU KILN 22: rotary Kiln 26-122, storage silos 26-003, 26-004.  
EU KILN 23: rotary Kiln 26-123, storage silos 26-003, 26-004.

EU CLINK COOL 19: clinker cooler 25-159, drag conveyor number seven 25-207.  
EU CLINK COOL 20: clinker cooler 25-160, drag conveyors 25-202, 25-204 shared between Clinker Cooler 20 and Clinker Cooler 21.  
EU CLINK COOL 21: clinker cooler 25-161, drag conveyors 25-202, 25-204 shared between Clinker Cooler 20 and Clinker Cooler 21.  
EU CLINK COOL 22: clinker cooler 26-162, conveyor 26-205.  
EU CLINK COOL 23: clinker cooler 26-163, conveyor 26-206.

EU FUEL PULV 19: storage tanks 36-002, pulverizer 613CR01, storage bin 614H001, conveyors 36-041, screw conveyor 614SC01.  
EU FUEL PULV 20: storage tanks 36-004, pulverizer 623CR01, storage bin 624H001, conveyors 36-042, screw conveyor 624SC01.  
EU FUEL PULV 21.: storage tanks 36-005, pulverizer 633CR01, storage bin 634H001, conveyors 36-043, screw conveyor 634SC01.  
EU FUEL PULV 22: storage tanks 37-001, pulverizer 6A3CR01, storage bin 6A4H001, conveyor 37-024, screw conveyor 6A4SC01.  
EU FUEL PULV 23: storage tank 37-002, pulverizer 683CR01, storage bin 684H001, conveyors 37-025, screw conveyor 684SC01.

**POLLUTION CONTROL EQUIPMENT:**

EURAW MILL 14: Dust collectors 20-268, 20-269, 20-275, 20-271, 20-270, 20-274.

EURAW MILL 15: Dust collectors 21-268, 21-269, 21-275, 21-271, 21-270.

EU KILN 19: Baghouse: 25-253, dust collectors: 25-247, 25-252;  
SNCR (Two storage tanks, NH<sub>3</sub>STGTANK, 40,000 gallon aqueous ammonia/urea storage tanks: 306 TN 01 and 306 TN 02, Feed System Skid for KG5: 306 FS 04, and Ammonia Analyzer: 306 AG 02);  
DM (two hoppers: 314 HO 01 and 314 HO 02, DM reagent storage silo: 304 SO 01, and associated dust collector: 304 DC 10).

EU KILN 20: Baghouse: 25-265, dust collectors: 25-278, 25-263;  
SNCR (Two storage tanks, NH<sub>3</sub>STGTANK, 40,000 gallon aqueous ammonia/urea storage tanks: 306 TN 01 and 306 TN 02, Feed System Skid for KG5: 306 FS 04, and Ammonia Analyzer: 306 AG 02);  
DM (two hoppers: 324 HO 01 and 324 HO 02, DM reagent storage silo: 304 SO 01, and associated dust collector: 304 DC 10).

EU KILN 21: Baghouse: 25-265, dust collectors: 25-279, 25-264;  
SNCR (Two storage tanks, NH<sub>3</sub>STGTANK, 40,000 gallon aqueous ammonia/urea storage tanks: 306 TN 01 and 306 TN 02, Feed System Skid for KG5: 306 FS 04, and Ammonia Analyzer: 306 AG 02);  
DM (two hoppers: 334 HO 01 and 334 HO 02, DM reagent storage silo: 304 SO 01, and associated dust collector: 304 DC 10).

EU KILN 22: Baghouse: 26-256, dust collectors: 26-254, 26-255;  
SNCR (Two storage tanks, NH<sub>3</sub>STGTANK, 40,000 gallon aqueous ammonia/urea storage tanks: 306 TN 01 and 306 TN 02, Feed System Skid for KG6: 306 FS 05, and Ammonia Analyzer: 306 AG 03); Wet FGD: 308 WS 01.

EU KILN 23: Baghouse: 26-262, dust collectors: 26-260, 26-261;  
SNCR (Two storage tanks, NH<sub>3</sub>STGTANK, 40,000 gallon aqueous ammonia/urea storage tanks: 306 TN 01 and 306 TN 02, Feed System Skid for KG6: 306 FS 05, and Ammonia Analyzer: 306 AG 03); Wet FGD: 308 WS 01.

EU CLINK COOL 19: dust collectors 25-507, 25-506.

EU CLINK COOL 20: dust collectors 25-507, 25-267, 25-506.

EU CLINK COOL 21: dust collectors 25-507, 25-268, 25-506.

EU CLINK COOL 22: dust collectors 26-251, 26-252, and 26-825 (shared between Clinker Coolers 22 and 23).

EU CLINK COOL 23: dust collectors 26-257, 26-258, and 26-825 (shared between Clinker Coolers 22 and 23).

EU FUEL PULV 19: dust collectors 613DC01, 614DC01.

EU FUEL PULV 20: dust collectors 623DC01, 624DC01.

EU FUEL PULV 21: dust collectors 633DC01, 634DC01.

EU FUEL PULV 22: dust collectors 6A3DC01, 6A4DC01.

EU FUEL PULV 23: dust collectors 683DC01, 684DC01.

Stack and Vent Identification:

EURAW MILL 14 SV20-268, SV20-269, SV20-275, SV20-271, SV20-270.

EURAW MILL 15 SV21-268, SV21-269, SV21-275, SV21-271, SV21-270.

EU KILN 19 Kiln 19 SV25-289.

EU KILN 20 Kiln 20 SV25-290.

EU KILN 21 Kiln 21 SV25-291.

EU KILN 22: SV26-292A (stack shared by Kilns 22 and 23).

EU KILN 23: SV26-292A (stack shared by Kilns 22 and 23).

EU CLINK COOL 19: SV25-507, SV25-507A  
EU CLINK COOL 20: SV25-507, SV25-507A  
EU CLINK COOL 21: SV25-507, SV25-507A.  
EU CLINK COOL 22: SV26-252.  
EU CLINK COOL 23: SV26-258.

EU FUEL PULV 19: SV613-01.  
EU FUEL PULV 20 : SV623-01.  
EU FUEL PULV 21 : SV633-01.  
EU FUEL PULV 22 : SV6A3-01.  
EU FUEL PULV 23: SV6B3-01.

#### **I. EMISSION LIMITS**

<b>Pollutant</b>	<b>Limit</b>	<b>Time Period/ Operating Scenario</b>	<b>Equipment</b>	<b>Testing / Monitoring Method</b>	<b>Underlying Applicable Requirements</b>
1. Mercury	218.0 lbs/year	12-month rolling time period, as determined at the end of each calendar month	Limit applies to all emission units combined in FG MERCURY	SC V.1, SC V.2, SC VI.1	R 336.1228, R 336.1229(2)(b)

#### **II. MATERIAL LIMITS**

NA

#### **III. PROCESS/OPERATIONAL RESTRICTIONS**

NA

#### **IV. DESIGN/EQUIPMENT PARAMETERS**

NA

#### **V. TESTING/SAMPLING**

Records shall be maintained on file for a period of five years. (R 336.1201(3))

1. Within 180 days after commencement of initial startup of the wet FGD system for FG KG6 and once every five years thereafter, the permittee shall verify mercury emissions from each emission unit in FG RAW MILL SYS, FG KG5, FG KG6, and FG CLINK COOL, by testing at owner's expense, in accordance with AQD requirements. No less than 30 days prior to testing, the permittee shall submit a complete test plan to the AQD. The AQD must approve the final plan prior to testing. Verification of emission rates includes the submittal of a complete report of the test results to the AQD within 60 days following the last date of the test. (R 336.1228, R 336.1229(2)(b), R 336.2001, R 336.2003, R 336.2004)
2. Within 180 days after commencement of initial startup of the wet FGD system on FG KG6, and at a minimum of every two weeks thereafter, the permittee shall sample mercury concentrations in the fuels, raw materials, and cement kiln dust, used to produce clinker. No less than 30 days prior to the first sampling, the permittee shall submit a complete sampling plan to the AQD. The AQD must approve the final sampling plan, and any modified or updated sampling plan, prior to sampling. Verification of sampling includes maintaining complete reports of the sample results and making the reports available to the AQD upon request. (R 336.1228, R 336.1229(2)(b))

**VI. MONITORING/RECORDKEEPING**

Records shall be maintained on file for a period of five years. (R 336.1201 (3))

1. The permittee shall calculate, in a satisfactory manner acceptable to the AQD, the mercury emissions from FG MERCURY. The permittee shall use Appendix 1, or other method as approved by the AQD, to determine the monthly and 12-month rolling time period mercury emissions, as determined at the end of each calendar month. The permittee shall keep all records on file and make them available to the AQD upon request. (R 336.1228, R 336.1229(2)(b))

**VII. REPORTING**

NA

**VIII. STACK/VENT RESTRICTIONS**

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

Stack & Vent ID	Maximum Exhaust- Inside Diameter (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
1. SV20-269 (serves EU RAW MILL 14)	27.1	79	R 336.1225, R 336.1228, R 336.1229(2)(b), R 336.2803, R 336.2804, 40 CFR 52.21(c) and (d)
2. SV21-269 (serves EU RAW MILL 15)	13.6	79	R 336.1225, R 336.1228, R 336.1229(2)(b), R 336.2803, R 336.2804, 40 CFR 52.21(c) and (d)
3. SV 25-289 (serves EU KILN 19)	156	220	R 336.1225, R 336.1228, R 336.1229(2)(b), R 336.2803, R 336.2804, 40 CFR 52.21(c) and (d)
4. SV 25-290 (serves EU KILN 20)	156	220	R 336.1225, R 336.1228, R 336.1229(2)(b), R 336.2803, R 336.2804, 40 CFR 52.21(c) and (d)
5. SV 25-291 (serves EU KILN 21)	156	220	R 336.1225, R 336.1228, R 336.1229(2)(b), R 336.2803, R 336.2804, 40 CFR 52.21(c) and (d)
6. SV 26-292A (serves FG KG6)	100*	250*	R 336.1225, R 336.1228, R 336.1229(2)(b), R 336.2803, R 336.2804, 40 CFR 52.21(c) and (d)
7. SV 25-507 (serves EU CLINK COOL 19, EU CLINK COOL 20, EU CLINK COOL 21)	78*	69*	R 336.1225, R 336.1228, R 336.1229(2)(b), R 336.2803, R 336.2804, 40 CFR 52.21(c) and (d)

Stack & Vent ID	Maximum Exhaust - Inside Diameter (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
8. SV25-507A (serves EU CLINK COOL 19, EU CLINK COOL 20, EU CLINK COOL 21)	78*	69*	R 336.1225, R 336.1228, R 336.1229(2)(b), R 336.2803, R 336.2804, 40 CFR 52.21(c) and (d)
9. SV 26-252 (serves EU CLINK COOL 22)	66	49	R 336.1225, R 336.1228, R 336.1229(2)(b), R 336.2803, R 336.2804, 40 CFR 52.21(c) and (d)
10. SV 26-258 (serves EU CLINK COOL 23)	66	49	R 336.1225, R 336.1228, R 336.1229(2)(b), R 336.2803, R 336.2804, 40 CFR 52.21(c) and (d)

**IX. OTHER REQUIREMENTS**

1. The permittee shall comply with all applicable requirements of a state or federal plan implementing the provisions of the federal Standards of Performance for Commercial and Industrial Solid Waste Incineration Units as specified in 40 CFR Part 60 Subpart A and Subpart DODD, as they apply to FG MERCURY. **(40 CFR Part 60 Subparts A & DDDD)**
2. The permittee shall comply with all applicable requirements of the National Emission Standards for Hazardous Air Pollutants from the Portland Cement Manufacturing Industry as specified in 40 CFR Part 60 Subpart A and Subpart LLL, as they apply to FG MERCURY. **(40 CFR Part 60 Subparts A & LLL)**

**Footnotes:**

\*This changes a condition of MI-ROP-81477-2012.

**.APPENDIX 1**

**Procedure to Monitor  
Mercury Emissions**

The Permittee shall determine mercury emissions for FG Mercury on a monthly and 12-month rolling time period, as determined at the end of each calendar month, for the purpose of determining compliance with the mercury emission limit. The following material balance method shall be used:

1. Every two weeks samples of the kiln raw feed used, fuels used, wasted cement kiln dust (CKD), clinker, and synthetic gypsum shall be collected during normal operating conditions.
2. Samples of each material shall be composited and analyzed to determine the total monthly mercury concentration of the materials being processed.
3. All sampling and methods used to determine mercury concentrations shall be in accordance with USEPA sampling and analysis protocols and approved by the AQD.
4. The equation below shall be used to calculate monthly mercury emissions:

$$\text{MCMI} - \text{MCMO} = \text{MCME}$$

**Where:**

**MCMI** = The Monthly Calculated Mercury Input (pounds per month) – The mercury entering the process shall be the sum of the product of the mercury concentration of the kiln raw feed used and the mass of the kiln raw feed used and the product of the mercury concentration of each fuel used and the mass of each fuel used during the month.

**MCMO** = The Monthly Calculated Mercury Output (pounds per month) – The mercury leaving the process shall be the sum of the products of the mercury concentration of the clinker, permanently removed CKD, and synthetic gypsum for the month, and the respective mass of each material produced for the month.

**MCME** = The Monthly Calculated Mercury Emissions (pounds per month) - The mass of mercury emitted from FG Mercury shall be the Monthly Calculated Mercury Input minus the Monthly Calculated Mercury Output. The consecutive 12-month mercury emission rate shall be the sum of the individual monthly records for the current month and the preceding eleven months (pounds of mercury per 12-month rolling time period) after 12 months of initial data has been collected.

Production, sampling and testing records, including calculations and data, shall be completed and maintained by the permittee for 5 years and shall be made available to the Department upon request.

**Appendix B**  
**Public and FLM Comments**  
**and**  
**MDEQ Responses**

(The following 3 pages contain the MDEQ notice of the public comment period, which was held in October and November 2015, as published in MDEQ's biweekly Calendar of Events.)

**APPENDIX B  
MDEQ RESPONSE TO COMMENTS FROM THE PUBLIC  
AND THE FEDERAL LAND MANAGER (FLM)**

**National Park Service, U.S. Department of the Interior – Comments**

Comment

Visibility Progress: To support the MDEQ'S focus on SO<sub>2</sub> and NO<sub>x</sub> emissions, please include either in tables or charts the pollutant contributions to visibility impairment at Isle Royale and Seney. These data are readily available on the same website referenced for Figures 1-6.

Response

The MDEQ agrees, and Figures 4 and 5 (for Isle Royale) and 9 and 10 (for Seney) have been added to the Regional Haze 5-year Progress Report to provide pie chart breakdowns of pollutant contributions to visibility impairment. The pie charts depict the contributions of ammonium nitrate, ammonium sulfate, organic mass, elemental carbon, etc. to the worst days and best days. This information was obtained from the FLM Environmental Database website (<http://views.cira.colostate.edu/fed>).

Comment

NO<sub>x</sub> and SO<sub>2</sub> Statewide Emissions: While power plant emissions have decreased between the 2005 to 2011 inventories, NO<sub>x</sub> from non-EGU point sources are reported in Table 14 to increase, not decrease, as stated on page 29. The MDEQ should evaluate those sources contributing to this emissions increase, beyond the top 10 sources identified in Tables 7 and 8.

Response

The MDEQ rechecked the estimate for the 2011 non-EGU NO<sub>x</sub> category based on 2011 NEI Tier 1 data. It appears that the MDEQ NO<sub>x</sub> estimate of 99,509 tons/yr for 2011 listed in Table 14 (p. 29) was an overestimate due to inadvertent inclusion of two residential fuel combustion emission categories in the estimate. The 2011 non-EGU NO<sub>x</sub> estimate has been corrected in the revised Regional Haze 5-year Progress Report, based on the review of the more detailed 2011 NEI Tier 1/Tier 2 data to 82,238 tons/yr. As a result, the non-EGU NO<sub>x</sub> category will show a reduction of 3,660 tons/yr between 2005 and 2011. In addition, the "Area Source" emission totals for 2011 have been increased correspondingly to include the residential fuel combustion emission categories noted above.

It should also be noted that the compliance dates for many of the non-EGU BART requirements were set for future dates beyond 2011. Therefore, further NO<sub>x</sub> emission reductions can be expected from the non-EGU category towards meeting the 2018 RPGs. Future non-EGU BART compliance requirements include:

- The Lafarge Consent Decree required installation of SNCR NO<sub>x</sub> control on three kilns by December 1, 2011, and on two additional kilns by December 1, 2012.
- The Escanaba Paper Company FIP final rule compliance date was January 3, 2013, for the NO<sub>x</sub> BART limits for Boilers 8 and 9.

- The St. Marys Cement FIP BART requires SNCR and a 50% reduction in NO<sub>x</sub> emissions with NO<sub>x</sub> emission limits set for compliance by January 1, 2017.
- Finally, the Tilden Mining Company FIP set NO<sub>x</sub> limits for the indurating furnace/grate-kiln that will apply during 2015 by means of low NO<sub>x</sub> burner technology.

#### Comment

Assessment of Current Strategy: Consistent with 40 CFR 51.308(g)(6), the MDEQ needs to consider not only impacts of sources outside Michigan on Class I areas in Michigan, but also impacts of Michigan sources on Class I areas in other states. Has Michigan met all the emission reduction assumptions used by neighboring states in setting their 2018 visibility improvement goals?

#### Response

The MDEQ evaluated the potential impacts of Michigan sources on Class I areas in other states in the October 2010 Regional Haze SIP submittal. Section 1.1 of the SIP references the results of the MRPO modeling for Class I areas outside the state:

*In accordance with 40 CFR 51.308, photochemical modeling has been performed to evaluate Michigan's impact on other Class I areas. The criteria used to define one state's "impact" on another state's Class I area was not determined by the EPA; therefore, each state and RPO was given its own discretion to determine impacts. Based on the MRPO modeling and using a 5 percent or more contribution to total light extinction as impact criteria, emissions sources within Michigan impact only Isle Royale and Seney. More detailed analysis on Class I impacts is included in Appendix 1A.*

#### Comment

Consultation with Federal Land Managers: We were not aware that the MDEQ sent a copy of the draft progress report to the National Park Service. 40 CFR 51.308(i)(4) requires states to consult with FLM agencies on the five year progress reports.

#### Response

The MDEQ schedule for completing the 5-year SIP document did not allow for the extra time to provide the FLMs an opportunity to consult on the process. However, the 30-day comment period did provide the opportunity for the FLMs to provide input. In future haze work, the MDEQ will make every effort to provide consultation opportunities as needed.

### **U.S. Forest Service, U.S. Department of Agriculture - Comments**

#### Comment

Opportunity should have been given to the FLMs for consultation with the MDEQ earlier in the development of the document. In future efforts, the MDEQ should provide this opportunity for FLM input regarding the content and the technical analyses within the report, before it is finalized and placed on public notice, if possible.

#### Response

The MDEQ schedule for completing the 5-year SIP document did not allow for the extra time to provide the FLMs an opportunity to consult on the process. However, the 30-day comment period did provide the opportunity for the FLMs to provide input. In future haze work, the MDEQ will make every effort to provide consultation opportunities as needed.

#### Comment

On page 5 the document states that the BART requirements for St. Marys Cement will be effective on January 1, 2017, and that the facility permit will be re-opened at that time to incorporate the BART requirements. With the normal time needed to draft and issue an operating permit, it is not clear how the modified permit will be ready for the facility to make needed changes in time for compliance on January 1, 2017.

#### Response

The limits imposed under the St. Marys Cement BART FIP are already federally enforceable per the terms of the FIP. In addition, the state-enforceable Title V permit MI-ROP-B1559-2014 (effective August 20, 2014) requires BART compliance (FGKILNRAWMILLS, Special Condition IX.4). Further, Section 10.5.6 of the Michigan October 2010 Regional Haze SIP submittal states:

*The BART control evaluations are required by a state rule adopted on September 11, 2008, and the limits and provisions of each source's BART determination are enforceable through consent order and permits. The state rulemaking that makes BART an applicable requirement for stationary sources can be found in Appendix 9A.*

The USEPA noted in the FIP that their BART determination for the facility includes operation of SNCR and a 50% reduction in NO<sub>x</sub> emissions. The SNCR system is already in place, but had not previously been operated year-round. In addition, the USEPA concluded in the FIP that add-on SO<sub>2</sub> control was not warranted as BART. Therefore, it may be that no further equipment changes are needed for compliance with BART limits by January 1, 2017. However, if a PTI is needed to cover the FIP requirements or any equipment changes, it is likely a PTI could be issued within a 60 to 90 day timeframe. Any PTI issued for this purpose will be state-enforceable. Eventually, the PTI would be rolled into the facility's ROP, and the BART requirements would continue to be state-enforceable.

#### Comment

Tables 7 through 10 provide very valuable data. If similar tables are included in the next SIP revision, please add a table for the Boundary Waters Canoe Area Wilderness, and include out-state sources beyond just power plants - such as taconite plants and others.

#### Response

The commenter provided a good suggestion that the MDEQ will consider if modeling resources are available that can determine impacts for the Michigan Class I areas, as well as Boundary Waters Canoe Area Wilderness.

#### Comment

A large number of states, including Michigan, set reasonable progress goals based on modeling that did not include estimates of what neighboring states ended up planning for BART and/or reasonable progress. This was primarily due to states moving on different timelines to submit their SIPs. To what degree did the modeling the MDEQ used to set the reasonable progress goals incorporate the BART and reasonable progress reductions of neighboring states?

#### Response

The 2010 Regional Haze SIP submittal indicates that some of the control measures applied by other states were known and accounted for in the reasonable progress goals at the time of the SIP submittal in early November, 2010, as follows:

*"The RPG is set at the visibility level shown to result from the application of all the elements of the DNRE's long-term strategy, along with all currently known controls being applied by other states."*

However, the 2010 SIP states that future modeling would be needed to fully account for all reductions occurring in other states. To date, the modeling has not been done.

### **Cliffs Natural Resources Comments**

#### **Comment**

Please update the following paragraph to reflect that the proposed FIP Rule was published in the Federal Register on October 22, 2015: Page 6, Fifth Paragraph:

*"This will be incorporated in a revision to the FIP that is expected to be proposed in October 2015."*

#### **Response**

As requested, the wording in the proposed SIP document was changed to read as follows:

*"These changes to the limits were included in the proposed FIP Rule that was published in the Federal Register on October 22, 2015."*

#### **Comment**

To remain consistent with the proposed FIP Rule language, please update the following paragraph to reflect a proposed limit based on a 720-hour rolling average, not 30-day rolling average: Page 6, Sixth Paragraph:

*"The indurating furnace NOx limits will be 1.5 lbs NOx per MMBTU (30-day rolling average) when burning a mixture of fuels or 2.8 lbs NOx per MMBTU (30-day rolling average) when only natural gas is fired."*

#### **Response**

As requested, the wording in the proposed SIP document was changed to reflect the revised limits from the proposed FIP Rule that was published in the *Federal Register* on October 22, 2015, as follows:

*"The indurating furnace NOx limits based on the proposed FIP rule will be 2.8 lbs NO<sub>x</sub>/MMBtu, based on a 720-hour rolling average, when burning natural gas, and 1.5 lbs NO<sub>x</sub>/MMBtu, based on a 720-hour rolling average, when burning coal or a mixture of coal and natural gas."*

#### **Comment**

To remain consistent with the proposed FIP Rule language, please delete the following: Page 7, First Paragraph – FIP SO<sub>2</sub> limits:

*"The FIP also sets SO<sub>2</sub> limits:*

*A fuel sulfur content limit of no greater than 1.20 percent sulfur content by weight shall apply to fuel combusted in Process Boiler #1 (EUBOILER1) and Process Boiler #2 (EUBOILER2) beginning 3 months from March 8, 2013. A fuel sulfur content limit of no greater than 1.50 percent sulfur content by weight shall apply to fuel combusted in the Line 1 Dryer (EUDRYER1) beginning 3 months from March 8, 2013... the facility must switch Grate Kiln Line 1 (EUKILN1) to 100 percent natural gas beginning 1 year from March 8, 2013..."*

And replace with the following:

*"The proposed FIP revision also sets SO<sub>2</sub> limits:*

*A fuel sulfur content limit of no greater than 1.20 percent sulfur content by weight shall apply to fuel combusted in Process Boiler #1 (EUBOILER1) and Process Boiler #2 (EUBOILER2) beginning 3 months from March 8, 2013. A fuel sulfur content limit of no greater than 1.50 percent sulfur content by weight shall apply to fuel combusted in the Line 1 Dryer (EUDRYER1) beginning 3 months from March 8, 2013...*

*The proposed FIP revision also sets SO<sub>2</sub> limits for Tilden Grate Kiln Line 1 furnace by requiring an initial SO<sub>2</sub> emission limit of 500 lb SO<sub>2</sub>/hr based on a 30-day rolling average and limiting coal sulfur content to 0.6% S by weight on a monthly block average. EPA may confirm or modify the SO<sub>2</sub> emission limit downward in the future based on data from Continuous Emission Monitors."*

#### Response

As requested, the wording in the proposed SIP document was changed to reflect the revised limits from the proposed FIP Rule that was published in the *Federal Register* on October 22, 2015, as follows:

*(2) SO<sub>2</sub> Emission Limits. A fuel sulfur content limit of no greater than 1.20 percent sulfur content by weight shall apply to fuel combusted in Process Boiler #1 (EUBOILER1) and Process Boiler #2 (EUBOILER2) beginning three months from March 8, 2013. A fuel sulfur content limit of no greater than 1.50 percent sulfur content by weight shall apply to fuel combusted in the Line 1 Dryer (EUDRYER1) beginning 3 months from March 8, 2013...*

*(3) The owner or operator of the Tilden Grate Kiln Line 1 furnace shall meet an emission limit of 500 lbs SO<sub>2</sub>/hr based on a 30-day rolling average beginning six months after [EFFECTIVE DATE OF FINAL RULE]... The Tilden Grate Kiln Line 1 furnace shall not be limited to natural gas fuel... EPA may adjust the 500 lbs/hr SO<sub>2</sub> limit downward to reflect the calculated SO<sub>2</sub> emission rate; however, EPA will not increase the SO<sub>2</sub> limit above 500 lbs/hr.*

#### Comment

Similar to the suggested edits for Page 6, sixth paragraph, please also update the limit average periods described in Table 1 to reflect the 720 hour rolling average, not 30-day rolling average. To remain consistent with the proposed FIP Rule language, please delete "Switch grate kiln lines to 100% natural gas by March 3, 2014," and replace with "Beginning 6 months after the effective date of the Rule, any coal burned on Tilden Grate Kiln Line 1 shall have no more than 0.60 percent sulfur by weight based on a monthly block average. Tilden Line 1 will have an initial SO<sub>2</sub> emission limit of 500 lbs SO<sub>2</sub>/hr (30-day rolling average). CEMS data will be used to evaluate future SO<sub>2</sub> emissions and confirm or modify the SO<sub>2</sub> limit, which may not increase above 500 lbs/hr."

#### Response

As requested, the Table 1 "Comments" column was revised to reflect the revised limits from the proposed FIP Rule that was published in the *Federal Register* on October 22, 2015, as follows:

*MI SIP proposed existing equipment/limits as BART. USEPA disapproved NOx and SO<sub>2</sub> BART limits in SIP for indurating furnace, boilers, line dryers, grate kiln. **USEPA Proposed FIP BART***

**Requirements:** Low NO<sub>x</sub> burners on indurating furnace; NO<sub>x</sub> limits of 1.5 lb NO<sub>x</sub>/MMBTU (720-hr rolling avg) coal or coal/nat gas mixture firing; or 2.8 lb/MMBTU (720-hr rolling avg) nat gas firing. S content limit of 1.2% S fuel - process boilers #1 and #2, 1.50% S fuel - Line 1 Dryer. By 6 mo. after the effective date of Rule, Grate Kiln Line 1 0.60 %S (wt) coal limit (monthly block avg); Line 1 initial SO<sub>2</sub> limit - 500lbs SO<sub>2</sub>/hr (30 day rolling avg). CEMS to confirm or modify the SO<sub>2</sub> limit - may not increase > 500 lbs/hr.

#### Comment

Cliffs believes it is important to understand and acknowledge the significance of international emission sources on visibility impairment in Michigan's Class I airsheds. Additional work is needed to characterize the extent that emissions from Canadian sources near the international border, i.e. paper mills, power plants, wildfires, etc., are contributing to visibility impairment in Michigan's Class I airsheds and how emissions from those sources are trending. In particular, additional attention should be placed on the significance of forest fires in Ontario and how recent changes in Ontario's forest fire management strategy will impact visibility impairment in Michigan's Class I airsheds. As noted in the attached documents, Ontario's forest fire management strategy has just recently shifted from its historical objective to "suppress all fires quickly and limit the size as much as possible," to a different strategy that allows forest fires to burn unless an important resource value, community or infrastructure is threatened. The attached documents highlights some of those forest fire management changes, taking into account resource limitations, longer and more severe fire seasons, and shifting of fire-fighting priorities to resource/economic protection. This shift in strategy from full forest fire suppression to monitoring and responding only as necessary will likely result in a large numbers of future forest fires being allowed to burn naturally, resulting in worsening visibility impacts to Michigan's Class I airsheds, despite ongoing efforts to reduce regional haze pollutants from Michigan point sources.

Please provide a discussion on how emissions from international sources, including wildfires, have been evaluated and accounted for in the current Five-Year Regional Haze Progress Report. To that end, following is suggested language that could be inserted into the current Five-Year Regional Haze Progress Report:

*"As noted in Michigan's October 2010 Regional Haze SIP Submittal, Michigan's two Class I areas may have visibility impacts resulting from nearby Canadian emissions. However, estimates of this international impact vary due to difficulties quantifying Canadian emissions and discrepancies between models. Michigan DEQ requests that EPA work with Canada, and in particular, Ontario, so that future SIP revisions for regional haze will be able to include more accurate emission estimates and modeling in order to better quantify international emission background and the impact those emissions have on Michigan's Class I Areas' visibility. Additional work is needed to better understand Canadian emissions from wood processing and paper manufacturing facilities; power generating facilities; and forest fires in close proximity to the border. EPA should also work with Ontario Ministry of Natural Resources to better understand how recent changes in Ontario's forest fire management program could contribute to additional visibility impacts in Michigan's Class I Areas. Where possible, EPA should then work with Canada and support reductions in haze-causing emissions."*

#### Response

The MDEQ evaluated the potential impacts of Canadian wildfires in the October 2010 Regional Haze SIP submittal. Section 10.5.5 of the SIP references possible impacts at Isle Royale and Seney due to wildfires in Canada:

*The MRPO (2007) identified three days at Isle Royale and one day at Seney that had high OC. Using back trajectories and satellite maps of fires, it appears that monitoring data for all of the days was influenced by wildfires in Canada. Subtracting these days from the 20 percent worst days had a 0.2 dV reduction for Isle Royale and no change at Seney.*

*Although the data show that fires do have some impact on visibility at Isle Royale, the impacts on the 20 percent worst days tend to be only a few poor visibility days in the summer caused by wildfires. Often these wildfires occur in Canada. For these reasons, the DNRE determined that OC particles are not good candidates for additional controls as part of the long-term strategy. Emissions from wildfires should be included in natural condition estimates, and any transboundary fire impacts must be addressed by the USEPA.*

The MDEQ agrees there is a need to work with the USEPA and Canada on transboundary air pollution issues including emission sources impacting visibility at Michigan's two regional haze Class I areas. Recent discussions with the USEPA and Canada included MDEQ participation at the November 19, 2015, Canada/U.S. Air Quality Committee meeting. As discussed at the meeting, the Canada/U.S. Air Quality Committee, Subcommittee 2 on Scientific Cooperation 2016 Work Plan includes ongoing activities in support of the determination of transboundary contributions to visibility degradation including joint monitoring, modeling, and analysis; evaluation of visibility forecasting skill; and evaluation of inter-comparisons of different monitoring methodologies.

One of the ongoing efforts related to forest fires described in a presentation at the Canada/U.S. Air Quality Committee meeting is a modeling project to forecast near-real time air quality levels from forest fire emissions. The modeling is done using the FireWork model developed by Environment Canada. This model is also capable of forecasting long range pollution transport from wildfires.

# **APPENDIX C**

## **COMMENT LETTERS and EMAIL**



**File Code:** 2580

**Date:** November 17, 2015

Ms. Cari DeBruler  
MDEQ - Air Quality Division  
P.O. Box 30260  
Lansing, Michigan 48909

Dear Ms. DeBruler,

Thank you for the opportunity to review Michigan's Regional Haze State Implementation Plan (SIP) 5-Year Progress Report (Report). I have Federal Land Manager responsibilities for the Boundary Waters Canoe Area Wilderness (BWCAW) in northeastern Minnesota. Collaboration is a key component to improving visibility in the Nation's treasured Class I areas. Overall I found the report well-written and informative. The report clearly demonstrates that in Michigan progress has been made, and more is to come as Best Available Retrofit Technology (BART) and power plant reductions are implemented. Please find my comments below.

- 1) On page 32 of the Report under "Consultation with Federal Land Managers" is the statement:  
The State will provide the FLM with an opportunity for consultation during our public participation process to review and discuss our draft five-year progress report. Any comments received from the FLM will be included in our formal response to comments document that will be provided to the USEPA at the conclusion of the comment period.

I would have appreciated being involved earlier in the process of developing this report. I read 40 CFR Section 51.308(i) (4) to require FLM consultation on this Report:

The plan (or plan revision) must provide procedures for continuing consultation between the State and Federal Land Manager on the implementation of the visibility protection program required by this subpart, including development and review of implementation plan revisions and 5-year progress reports, and on the implementation of other programs having the potential to contribute to impairment of visibility in mandatory Class I Federal areas.

In future efforts, I would have appreciated the opportunity to provide input regarding the content and the technical analyses within the report before it was finalized and placed on public notice, if possible.

- 2) In regards to St Mary's Cement, on page 5 you indicate that the BART requirements will be effective on January 1, 2017 and that you will re-open the facility's permit at that time to incorporate the BART requirements. It is our experience that it can take a number of months to draft and issue a revision to an operating permit. Please clarify how the modified permit will be ready for the facility to make needed changes at their facility all in time for compliance on January 1, 2017.



3) Tables 7 through 10 provide very valuable data. If similar tables are included in the next SIP revision please add a table for the Boundary Waters Canoe Area Wilderness, and include out-state sources beyond just power plants - such as taconite plants and others.

4) I am concerned that a large number of states, including Michigan, set reasonable progress goals based on modeling that did not include estimates of what neighboring states ended up planning for BART and/or reasonable progress. This was primarily due to states moving on different timelines to submit their SIPs. Please comment on the degree to which the modeling you used to set your reasonable progress goals incorporated the BART and reasonable progress reductions of your neighboring states.

Thank you, for your consideration of these comments. If you have any technical questions please contact Trent Wickman at (218) 626-4372.

Sincerely,



BRENDA HALTER

cc: Pat Brewer, Tim Allen, Alvarez Gilberto, John Summerhays, Judi Henry



# United States Department of the Interior

## NATIONAL PARK SERVICE

Air Resources Division

P.O. Box 25287

Denver, CO 80225-0287

TRANSMITTED VIA ELECTRONIC MAIL - NO HARDCOPY TO FOLLOW

N3615 (2350)

November 16, 2015

Ms. Cari DeBruler  
Michigan Department of Environmental Quality  
Air Quality Division  
P.O. Box 30260  
Lansing, Michigan 48909

Dear Ms. DeBruler:

We learned from the US Forest Service that Michigan Department of Environmental Quality (MDEQ) released a draft Five-Year Regional Haze Progress Report for public comment. We reviewed the draft progress report and offer the following suggestions to improve the demonstration that MDEQ is on track to meet the 2018 visibility improvement goals set in the 2010 Regional Haze State Implementation Plan.

**Visibility Progress:** To support MDEQ's focus on sulfur dioxide (SO<sub>2</sub>) and nitrogen oxide (NO<sub>x</sub>) emissions, please include either in tables or charts the pollutant contributions to visibility impairment at Isle Royale National Park and Seney Wilderness Area. These data are readily available on the same website referenced for Figures 1-6.

**NO<sub>x</sub> and SO<sub>2</sub> Statewide Emissions:** While power plant emissions have decreased between the 2005 to 2011 inventories, NO<sub>x</sub> from non-EGU point sources are reported in Table 14 to increase, not decrease, as stated on page 29. MDEQ should evaluate those sources contributing to this emissions increase, beyond the top 10 sources identified in Tables 7 and 8.

**Assessment of Current Strategy:** Consistent with 40 DFR 51.308(g)(6), MDEQ needs to consider not only impacts of sources outside Michigan on Class I areas in Michigan, but also impacts of Michigan sources on Class I areas in other states. Has Michigan met all the emission reduction assumptions used by neighboring states in setting their 2018 visibility improvement goals?

**Consultation with Federal Land Managers:** We are not aware that MDEQ sent a copy of the draft progress report to the National Park Service. 40 CFR 51.308(i)(4) requires states to consult with Federal Land Management agencies on the five year progress reports.

We appreciate the opportunity to work with MDEQ to improve visibility in our Class I national park and wilderness areas. If you have questions, please contact Pat Brewer at [patricia\\_f\\_brewer@nps.gov](mailto:patricia_f_brewer@nps.gov) or 303-969-2153.

Sincerely,

A handwritten signature in black ink, appearing to be 'SJ', with a horizontal line extending to the right.

Susan Johnson  
Chief, Policy, Planning, and Permit Review Branch

cc:

John Summerhays, EPA Region 5  
David Pohlman, NPS Midwest Region

**From:** Aagenes, Jason D [mailto:Jason.Aagenes@CliffsNR.com]  
**Sent:** Wednesday, November 18, 2015 4:00 PM  
**To:** DeBruler, Cari (DEQ)  
**Cc:** Long, Michael E  
**Subject:** RE: Michigan Regional Haze Progress Report Comments - Cliffs Natural Resources

Ms. DeBruler:

Cliffs Natural Resources appreciates the opportunity to comment on Michigan's Draft Five-Year Regional Haze Progress Report and would like to submit the following comments for Michigan DEQ to consider when finalizing the document.

**Corrections to the Status of Control Strategies in the Regional Haze SIP, Non-EGU BART-subject Sources for Tilden Mining Company, LLC**

- Pg 6, Fifth Paragraph – “This will be incorporated in a revision to the FIP that is expected to be proposed in October 2015.”
  - Please update this paragraph to reflect that the proposed FIP Rule was published in the Federal Register on October 22, 2015.
- Pg 6, Sixth Paragraph – “The indurating furnace NOx limits will be 1.5 lbs NOx per MMBTU (30 day rolling average) when burning a mixture of fuels or 2.8 lbs NOx per MMBTU (30 day rolling average) when only natural gas is fired.”
  - To remain consistent with the proposed FIP Rule language, please update this paragraph to reflect a proposed limit based on a 720 hour rolling average, not 30 day rolling average.
- Pg 7, First Paragraph – FIP SO2 limits
  - To remain consistent with the proposed FIP Rule language, please delete the following:
    - “The FIP also sets SO<sub>2</sub> limits:

*A fuel sulfur content limit of no greater than 1.20 percent sulfur content by weight shall apply to fuel combusted in Process Boiler #1 (EUBOILER1) and Process Boiler #2 (EUBOILER2) beginning 3 months from March 8, 2013. A fuel sulfur content limit of no greater than 1.50 percent sulfur content by weight shall apply to fuel combusted in the Line 1 Dryer (EUDRYER1) beginning 3 months from March 8, 2013... the facility must switch Grate Kiln Line 1 (EUKILN1) to 100 percent natural gas beginning 1 year from March 8, 2013...”*

- And replace with the following:
  - “The proposed FIP revision also sets SO<sub>2</sub> limits:

*A fuel sulfur content limit of no greater than 1.20 percent sulfur content by weight shall apply to fuel combusted in Process Boiler #1 (EUBOILER1) and Process Boiler #2 (EUBOILER2) beginning 3 months from March 8, 2013. A fuel sulfur content limit of no greater than 1.50 percent sulfur content by weight shall apply to fuel combusted in the Line 1 Dryer (EUDRYER1) beginning 3 months from March 8, 2013...*

*The proposed FIP revision also sets SO<sub>2</sub> limits for Tilden Grate Kiln Line 1 furnace by requiring an initial SO<sub>2</sub> emission limit of 500 lb SO<sub>2</sub>/hr based on a 30 day rolling average and limiting coal sulfur content to 0.6% S by weight on a monthly block average. EPA may confirm or modify the SO<sub>2</sub> emission limit downward in the future based on data from Continuous Emission Monitors."*

- Pg 8, Table 1
  - Similar to the suggested edits for Pg 6, sixth paragraph, please also update the limit average periods described in Table 1 to reflect the 720 hour rolling average, not 30 day rolling average.
  - To remain consistent with the proposed FIP Rule language, please delete "Switch grate kiln lines to 100% natural gas by March 3, 2014.", and replace with "Beginning 6 months after the effective date of the Rule, any coal burned on Tilden Grate Kiln Line 1 shall have no more than 0.60 percent sulfur by weight based on a monthly block average. Tilden Line 1 will have an initial SO<sub>2</sub> emission limit of 500lbs SO<sub>2</sub>/hr (30 day rolling average). CEMS data will be used to evaluate future SO<sub>2</sub> emissions and confirm or modify the SO<sub>2</sub> limit, which may not increase above 500 lbs/hr."

### International Emissions

Cliffs believes it is important to understand and acknowledge the significance of international emission sources on visibility impairment in Michigan's Class I airsheds. Additional work is needed to characterize the extent that emissions from Canadian sources near the international border, i.e. paper mills, power plants, wildfires, etc., are contributing to visibility impairment in Michigan's Class I airsheds and how emissions from those sources are trending. In particular, additional attention should be placed on the significance of forest fires in Ontario and how recent changes in Ontario's forest fire management strategy will impact visibility impairment in Michigan's Class I airsheds. As noted in the attached documents, Ontario's forest fire management strategy has just recently shifted from its historical objective to "suppress all fires quickly and limit the size as much as possible", to a different strategy that allows forest fires to burn unless an important resource value, community or infrastructure is threatened. The attached documents highlights some of those forest fire management changes, taking into account resource limitations, longer and more severe fire seasons, and shifting of fire-fighting priorities to resource/economic protection. This shift in strategy from full forest fire suppression to monitoring and responding only as necessary will likely result in a large numbers of future forest fires being allowed to burn naturally, resulting in worsening visibility impacts to Michigan's Class I airsheds, despite ongoing efforts to reduce regional haze pollutants from Michigan point sources.

Please provide a discussion on how emissions from international sources, including wildfires, have been evaluated and accounted for in the current Five-Year Regional Haze Progress Report. If Michigan DEQ does not currently have sufficient information to support such an evaluation, Cliffs Natural Resources requests that Michigan DEQ, in cooperation with EPA and other states, begin characterizing emissions from near-border Canadian sources so that future Regional Haze progress reports can more accurately quantify those emissions and evaluate their visibility impacts on Class I airsheds. To that end, following is suggested language that could be inserted into the current Five-Year Regional Haze Progress Report:

*"As noted in Michigan's October 2010 Regional Haze SIP Submittal, Michigan's two Class I areas may have visibility impacts resulting from nearby Canadian emissions. However, estimates of this international impact vary due to difficulties quantifying Canadian emissions and*

*discrepancies between models. Michigan DEQ requests that EPA work with Canada, and in particular, Ontario, so that future SIP revisions for regional haze will be able to include more accurate emission estimates and modeling in order to better quantify international emission background and the impact those emissions have on Michigan's Class I Areas' visibility. Additional work is needed to better understand Canadian emissions from wood processing and paper manufacturing facilities; power generating facilities; and forest fires in close proximity to the border. EPA should also work with Ontario Ministry of Natural Resources to better understand how recent changes in Ontario's forest fire management program could contribute to additional visibility impacts in Michigan's Class I Areas. Where possible, EPA should then work with Canada and support reductions in haze-causing emissions."*

Please feel free to contact me if you have any questions or need additional information.



Jason Aagenes

Director, Air Regulatory Strategy and Programs

O 218.744.6037 M 218.290.5936 [Jason.Aagenes@CliffsNR.com](mailto:Jason.Aagenes@CliffsNR.com)

CLIFFS NATURAL RESOURCES

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